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Rural livelihoods on bamboo handicraft making and culm vending in Mvera, Malawi

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Abstract—The bamboo enterprises involving handicraft making and culm vending in Mvera, Dowa district, Malawi were studied from October to December 2003. The aims of the research were to find out the contribution of bamboo enterprises to household income and the management practices of the bamboo handicraft makers and bamboo collectors, and the activities of stakeholders in the bamboo industries in Mvera. Eighteen respondents were randomly selected from the bamboo culm vending community for questionnaire survey and stratified random sampling was used to select 74 respondents from bamboo handicraft making villages. Focus groups discussions on issues of bamboo enterprises were conducted in each of the five villages selected. Perceived stakeholders were consulted to examine their roles in bamboo enterprises. It was found that an average bamboo handicraft maker used 681 bamboo culms per year and an average bamboo culm vendor cut 1146 culms per year. It was also found that an average bamboo handicraft maker obtained MK 20 684 (US$ 190) per year from the cash sales of assorted handicrafts and an average bamboo culm vendor obtained MK 10 833 (US$ 100) per year from bamboo culm cash sales. An average bamboo entrepreneur obtained MK 3251 (US$ 30) from farm cash sales. However, the average bamboo entrepreneur consumed an amount of their own farm produce worth MK 26 679 (US$ 247), which was about 1.5 times as much as average bamboo income of MK 18 417 (US$ 170). All respondents indicated that the income from bamboo enterprise was mainly for household petty cash, i.e., hand-to-mouth consumption. No significant bamboo management practices were carried out by the entrepreneurs. Bamboos were naturally growing in Thuma Forest Reserve, where most of the bamboos were collected. A few stakeholders in bamboo enterprise and resource management were merely involved in actual promotion of bamboo handicraft industry and actual bamboo management by their policies and interventions.

Key words: Bamboo enterprises; handicrafts; livelihood diversification; household income; agricultural production; bamboo management; stakeholders.

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INTRODUCTION

In Malawi, rural farmers are diversifying in various economic activities, and studies show that natural resource related economic activities are explored to diversify their livelihoods [1]. There is increased use of non-timber forest products by rural farmers in Malawi [2, 3]. Bamboo is one of the natural capitals that are predisposing rural farmers to rural-urban trade [2, 3]. Bamboos in Malawi are not planted but collected from Forest Reserves, e.g., Thambani Forest Reserve and Thuma Forest Reserve. There is still a long way for bamboo plantations to go before they can be used as economic supply of timber for industrial purposes, carbon sequestration sink and export of locally produced handicrafts. As of now, bamboo is a source of subsistence livelihood for poor rural farmers in these areas. Bamboo as a non-timber forest product is currently promoted as stipulated in National Forestry Policy but to a limited scale, as it will be discussed later in the article. Among the issues that the National Forestry Policy is promoting is the participation of local communities in the management of forest resources in Forest Reserves and on customary land [4]. The bamboo industry takes the form of most non-farm rural economies which have been researched to contribute significantly to household income and others having positive effects on agricultural production [5–7]. The aims of the research were to find out the contribution of bamboo enterprises to household income and the management practices of the bamboo handicraft makers and bamboo collected, and the activities of stakeholders in the bamboo industry in the study area.

Bamboo management in Malawi

There is not much research done on bamboos. The national forestry research body, Forestry Research Institute in Malawi (FRIM), is currently working mostly on timber forest research. However, a new focus on non-wood forest products (NWFP) is growing. Despite the growing interest in NWFP, bamboos are not strongly regarded to be potential NWFP [8]. Malawi is not a member of International Network of Bamboo and Rattan (INBAR); hence, no straightforward policies and practices on bamboo resource management and its related enterprise. The studies on 'production to consumption' systems have been carried out in Ethiopia, Tanzania, Uganda and Kenya. Analyses of economic contributions of bamboo to rural households at Mvera have been borrowed from those studies in East Africa.

Botanical description of bamboos in Thuma Forest Reserve

Three species of bamboo have been found in Malawi. Arundinaria alpina is a montane bamboo, *Oreobambos buchwaldi* is a submontane bamboo and *Oxytenanthera abyssinica* is a lowland bamboo in Malawi. *O. abyssinica* is abundant in Thuma Forest Reserve. It is a medium sized bamboo, widely distributed in eastern Africa. The young culms are usually semi-solid whereas the older culms are almost completely solid. It is the hardiest of the three commonly occurring East African bamboo species. *O. abyssinica* is common at the medium altitude in semi-deciduous

dry forest formation. Eggerling and Dale (cited in Ref. [9]), reported that flowering in *O. abyssinica* occurs in large areas about once every 7 years. After flowering, the clumps die and new shoots appear after a year. Observations by Williamson (1974) in Malawi [9], however, indicated that flowering took place sporadically or in a gregarious manner after which the plants died.

Thuma Forest Reserve

Thuma Forest Reserve, 13° 45′ to 13° 57′ S and 34° 09′ to 34° 16′ E, lies in Lilongwe and Salima districts. The Forest Reserve is situated to the north-east of Lilongwe on the escarpment of the Great Rift Valley. It is some 50 km away from Lilongwe Capital City and covers a total area of 16 395 ha [10]. Thuma Forest Reserve was gazetted as a protected forest reserve in 1926. The Department of Forestry manages and administers the Reserve under the 1997 Forest Act. There is no organised bamboo management from either the DFO or community side. Illegal tree and bamboo cutting were first reported in 1973 from Thuma Forest Reserve. Bamboos (*O. abyssinica*) are very abundant and farmers from Madaula and Chilombo villages extract bamboos from the Forest Reserve.

METHODOLOGY

The research study took place from October to December 2003 in Mvera in five villages, Chilombo, Dzuwa, Katengeza, Mpanje and Mulenga. Four villages were selected to represent villages that are engaged in bamboo handicraft making and its related trade and these were Mpanje, Katengeza, Dzuwa and Mulenga. Chilombo village was chosen to represent villages extracting bamboos from Thuma Forest Reserve. From each bamboo village site, respondents were selected from workshop clubs registered in the particular village engaged in bamboo handicraft making and a bamboo-extracting village, as shown in Table 1. The sample size depended on the size of the workshop, period of an individual in bamboo enterprise and age of the workshop in bamboo industry.

Focus group discussions

Focus group discussions (FGDs) were conducted in all villages to understand the dynamics of bamboo enterprises and management practices. Both males and females attended these FGDs, although only men patronised bamboo workshops. Mpanje provided three FGDs because of its diversity of bamboo enterprises and the presence of a women bamboo handicraft group. The last four FGDs were conducted in each of the remaining four villages. The communities were interviewed on the existing structures and dynamics of ‘production to consumption’ systems of bamboo enterprises and their participation in bamboo resource management. A checklist was used to run the focus group discussions. The checklist addressed the

Table 1.
Sampling profile by village

Village	No. of workshop clubs	Sample size	Sex	Type of bamboo enterprise*
Katengeza	5	30	M	Bb, Bf, Bcv
Mulenga	1	9	M	Bf, Bb
Chilombo	0	18	M and F	Bcv
Mpanje	3	20	M	Bf, Bb
Dzuwa	4	10	M	Bf, Bb
Chipala women (Mpanje)	1	9	F	Bf, Bb
Total	14	96		

* Bf = bamboo furniture, Bb = bamboo basketry, Bcv = bamboo culm vending.

following issues; historical trends of bamboo enterprise, conflicts and negotiations with Forestry Department guards at Thuma Forest Reserve, resource mapping of bamboo population dynamics, marketing of bamboo handicrafts, organisational structure of the community bamboo workshop clubs, perception of the handicraft producers on the effectiveness and efficiency of the potential stakeholders and their possible interventions on the enterprise production. The identification of stakeholders in bamboo enterprises and their level of agency in promoting bamboo enterprises and resource management were also conducted.

Questionnaire survey

The key informants, i.e., the heads of bamboo workshops, Forestry Department Headquarters and Salima District Forestry Office participated in developing key issues of the questionnaire. The questionnaire method extracted the respondents' demographic characteristics and performances in bamboo enterprise and agricultural production. Individual amounts of bamboo used for handicrafts and extracted or harvested from Thuma Forest Reserve were collected together with their respective incomes. Other household incomes from non-natural capital in the one hand and natural capital in the other hand were also collected. Types of bamboo enterprises undertaken by individual farmers were identified as well as other natural capital and non-natural activities. This method helped quantify the economic potential of bamboo enterprise to supplement agricultural production as a viable rural non-farm income. The household survey was aimed at collecting both categorical data and numerical data.

Data analysis

The 92 cases were entered in a SPSS 11.0 version spreadsheet. The categorical data were coded. Descriptive statistics were computed from the entered variables. Chi-square and t-significance tests were used to find the significance of dependence

and homogeneity, and difference, respectively, between some of the variables. Tests were conducted to find whether (1) there were no significant differences between the own farm consumption (crop) income and bamboo enterprise cash sales, (2) there were no significant differences between the bamboo entrepreneur's farm cash income and bamboo enterprise cash sales, (3) the perception of bamboo availability was not dependent on the proximity of the entrepreneur to Thuma Forest Reserve and (4) the commitment to bamboo enterprise during rainy season was not different among those doing bamboo handicraft and bamboo culm vending enterprises.

RESULTS AND DISCUSSION

Bamboo enterprises

It was found that the bamboo enterprises comprised bamboo culm collecting from Thuma Forest Reserve and bamboo handicraft making, which involves mainly furniture and partially baskets. Furniture handicrafts comprise all furniture-like items, such as sofa sets, table chairs, dining table, coffee tables, wardrobes, beds, shelves, bar stools, television stands, cupboards, etc. Basket handicrafts comprise winnows, flour baskets, fruit bowls, shopping baskets, washing baskets, etc. Bamboo furniture making contributed the higher portion of annual bamboos used for handicraft. There was higher turnover in furniture making than basket making. Consequently, more people were indulged in furniture making than basket making. It should be pointed out that bamboo handicraft requires a complementary raw material locally called chipapati. Chipapati is a creeping stem plant that is harvested and used for weaving processed bamboos in construction of handicrafts. However, details on chipapati were beyond the scope of the study.

Bamboos collected from Thuma Forest Reserve serve two major purposes and these purposes determine the type of bamboo. Hollow bamboos (tsungwa) are used for structural construction of farms structures, houses, fences, etc. Solid bamboos (malailosi) are used for handicraft making.

Extraction and utilization of bamboos

Hollow bamboos occupied a higher portion of the whole bamboo collected from Thuma Forest Reserve than solid bamboos. It was found that an average handicraft maker used 882 bamboo culms per year and an average bamboo vendor collected 7031 bamboo culms per year. This shows that an average bamboo handicraft maker only consumed approximately 13% of the total bamboo collected by the counterpart collector. The remaining part was sold to estate farmers, intra- and inter-village trade and urban dwellers for building farm structures and fences. The detailed explanation of quantities for the remaining part was beyond the scope of the study. It is also shown that the bamboo culm vending mainly comprises collecting hollow

Table 2.
Number of bamboo culms used and cut and entrepreneurs involved by villages

Village	Bamboo culms used (handicrafts and baskets)				Bamboo culms cut			
	N	*n*	Annual amount	Average amount	*N*	*n*	Annual amount	Average amount
Katengeza	29	31	36 640	1182 (1263)	2	31	2360	76 (1180)
Mpanje	22	24	6886	287 (313)	0	24	0	0 (0)
Dzuwa	9	10	7750	775 (861)	1	10	18 000	1800 (18000)
Mulenga	8	9	10 826	1203 (1353)	0	9	0	0 (0)
Chilombo	3	18	546	30 (182)	13	18	85 108	4728 (5006)
Overall	71	92	62 648	681 (882)	15	92	105 468	1146 (7031)

N = Number of cases which actually engaged in the particular activity, *n* = total. Values in parentheses are averages for actual cases engaged in the particular activity.

bamboo than solid bamboos. Consequently, bamboo vendors are more reliant on hollow bamboos rather than solid ones. The handicraft makers are reliant on the solid bamboos because of value addition. Reliance on different types of bamboo by the two bamboo entrepreneurs would affect the type of bamboo variety to be planted when bamboo plantation intervention is promoted. The bamboo culm vendors would prefer more hollow bamboos than solid ones in their homestead gardens. The handicraft makers would prefer the opposite. However, what makes some culms hollow and others solid was unexplained and unknown among the local people. Studies show that there is only one species in Thuma Forest Reserve. The bamboo culm vendors claimed that the hollow bamboos were more abundant than the solid bamboos. That is why hollow bamboos and solid bamboos were sold at MK 30–50 per 25-culm bundle and MK 120 per 25-culm bundle, respectively. Table 2 shows the details of quantities of bamboo culms used for handicraft making and cut in the surveyed villages and the actual number of respondents.

Although Katengeza village is considered as the centre of handicraft making in Mvera, it ranked second in the average annual amount of bamboos used per individual to Mulenga village. These two villages were quite ahead of the overall annual average of bamboo culms per individual. Chilombo had the lowest average annual bamboo used per individual because it is mainly a bamboo culm collecting and vending community. Mpanje was the second lowest in average bamboo usage because it included the women group of eight individuals who were currently under-manufacturing due to capital constraints.

Bamboo enterprises and household income

All households interviewed were smallholder farmers with average land holding of approximately 3 acres (1.2 ha). The major crops grown in the area are maize (staple food), groundnuts, sweet potatoes and cassava. Table 3 shows the average gross incomes for all the income sources.

Table 3.
Annual household cash incomes

	Whole sample	Total annual amount (MK)	Average amount (MK) for whole sample ($n = 92$)
Gross cash farm income			
Crop cash sales	92	222 830	2422
Livestock cash sales	92	76 235	829
Total farm cash sales	92	299 065	3251
Own-farm consumption			
Maize	92	1 077 360	11 710
Sweet potato	92	189 600	2061
Cassava	92	10 400	113
Groundnuts	92	1 177 069	12 794
Total own-farm consumption	92	2 454 429	26 679
Bamboo cash sales			
Handicraft making	69	1 427 180	20 684
Bamboo culm vending	18	195 000	10 833
Bamboo stakes	2	27 500	13 750
Handicraft ganyu casual labour	20	44 710	2236
Total bamboo enterprise income	87	1 694 390	19 476
Other non-farm income			
General trading	92	55 013	598
Firewood and charcoal	92	22 600	246
Non-farm wage	92	9500	103
Total non-farm income	92	87 113	947

Crop cash sales comprise maize, groundnuts, cassava and sweet potato sales. Livestock cash sales comprise live goat, pig and chicken sales. MK 108 = US$ 1 at the time of research.

By comparing the average cash incomes from bamboo enterprise sales and other household cash incomes shown in Table 3, bamboo handicraft making and bamboo culm vending contribute a considerable economic sustenance of the livelihoods of these craftsmen and bamboo vendors, respectively. A two-sample t-test showed that there is significant difference in the income contribution to household cash incomes between the bamboo enterprise income and farm cash sales (t-value = 6.18, d.f. = 106, $P < 0.001$). Assuming that there were no bamboos in the area and that the community was not deriving a livelihood from bamboos, they would have been more vulnerable. This would be aggravated with declining agricultural production and no presence of other perceived productive resources in the area. In this analysis, farm production for own household consumption was not considered as household cash income (*cf.*, Ref. [11]). However, if own farm consumption would be accounted for, there would be a different interpretation of household incomes. The accounting for own farm consumption becomes very important in poverty analysis as opposed to a simple cash income analysis. When own farm consumption is monetised based on average crop produce market prices during

2002–2003 growing season, average crop own-farm consumption was found to be MK 26 679 (US$ 247). A two-sample t-test showed that the own farm consumption income was significantly greater than bamboo enterprise income at $\alpha = 0.05$ (t-value = 2.26, d.f. = 176, $P = 0.013$). The crops considered in the own farm consumption analysis were maize, sweet potatoes, cassava and groundnuts; their corresponding market prices are MK 16/kg, MK 10/kg and MK 55/kg, respectively [11]. Own-farm consumption would be seen to contribute more to household income when other crops and livestock consumed were taken into account. The inclusion of own-farm consumption should however not undermine the economic contribution of household cash incomes, which are more important for household petty cash in monetised markets than in barter markets. Therefore, the significance of own-farm consumption should not overrule the policy makers in biasing on agricultural production interventions over non-farm activities hence affecting local people's pathway out of poverty [12].

Bamboo management and domestication

During focus group discussions and household surveys, it was found that only 10 individuals had homestead bamboos from which they could derive bamboos for their own uses. The total area of managed homestead bamboos was 11 acres. Traditionally, the bamboo users have not been domesticating bamboos for household use. The natural replenishment has been the only means that has provided a continuity of bamboo enterprise for decades. The agronomy of bamboo indicates that bamboo rhizomes are the main propagules. It was found that there were very few bamboo clumps in crop fields and customary land because they have been over-exploited. The other contribution to depletion of bamboos in the villages is the flowering of bamboos. Bamboos in the area flowered in 1974 and they died once they flowered. It was also reported by some bamboo handicraft workers that bamboos flowered in 2003 when the fieldwork was being carried out. The bamboo handicraft manufacturers did not indicate willingness to plant bamboos for handicraft production. Others indicated that bamboos would not do well in crop fields because of unfavourable soil type for bamboos. The flowering of bamboos was perceived to be a threat to the growing bamboo enterprises in the area.

Thuma Forest Reserve does not carry out co-management of bamboos with the bamboo extracting communities. Thuma Forest Reserve itself does not have management strategies for bamboo apart from control of harmful bushfires and restricted entry to collect bamboos. Much as the entry fee is used as a restrictive economic instrument, it raises revenue for the Salima District Forestry Office. The bamboo entrepreneurs showed interest in the co-management of bamboo resources in Thuma Forest Reserve and customary land, domestication of bamboo planting and penalties for violation of entry into Thuma Forest Reserve to manage the bamboo resources.

It was found that 45% of bamboo users and vendors perceived bamboo availability in Thuma Forest Reserve to be abundant (Table 4). A chi-square test showed that

Table 4.
Perception of bamboo availability in Thuma Forest Reserve

Village	Perception of bamboo availability			
	Abundant	Moderate	Scarce	Total
Katengeza	13	15	3	31
Mpanje	13	7	4	24
Dzuwa	6	3	1	10
Mulenga	4	5	0	9
Chilombo	5	8	5	18
Total	41	38	13	92

the proximity to Thuma Forest reserve significantly determined the perception of the bamboo entrepreneur ($\chi^2 = 4.5$, d.f. $= 2$, $P \leqslant 0.05$), i.e., the bamboo stem vendors of Chilombo village perceived that the bamboos were scarce in Thuma Forest Reserve, since they are closer to the source than the rest of the villages.

Markets

Informal monetised markets were observed to exist in both bamboo collecting and utilizing communities. Most households required money to obtain basic human economic needs. Two levels of markets were created by bamboo enterprises. Both intra- and inter-village markets for bamboo culms and related raw materials were common. Bamboo vendors got orders from bamboo handicraft makers to collect solid bamboo bundles for them. A bundle of solid bamboo was sold at MK 120 (US$ 1.10). Each bundle of bamboo contains 20–25 culms of solid bamboos. A bundle of hollow bamboos for structural construction was sold at MK 50 (US$ 0.46) at the main road and MK 30 at the collecting village (Chilombo). Chipapati markets were also observed to take place. Some people collected chipapati and sold it to the handicraft makers. A standard round (nkhata) of chipapati costs MK 2 and a huge round costs MK 20. Most of these chipapati vendors did not participate in handicraft making and bamboo vending though there might be some intersections. It was found that a sofa set of two single chairs and one double chair costs MK 2500 (US$ 23), a coffee table costs MK 500 (US$ 5) and stools MK 400 (US$ 4). A sofa set consumed two bundles of solid bamboo culms. Baskets cost MK 100 on average, depending on the size. A sofa set consumed 200 rounds of chipapati and a coffee table consumes 40 rounds. It was found that an average bamboo handicraft maker used 2143 rounds (214 kg) of chipapati per year (an average round weighs 100 g).

Labour regimes and gender

Self-employment, family labour and hired labour were the types of labour force employed in bamboo enterprises. Self-employment was found to be the more used

Table 5.
Labour regimes by village

Village	Labour regime		
	Self employment	Ganyu	Family labour
Katengeza	29	23	2
Mpange	22	10	7
Dzuwa	10	8	3
Mulenga	9	7	1
Chilombo	12	2	6
Total	82	50	19

labour regime. 89% of the interviewed indicated that they were self-employed in the enterprise, and 54% indicated that they used hired labour in their enterprise. This means that there is a labour market in bamboo enterprises. These informal employment opportunities help solve the income inequality [12]. Table 5 shows detailed labour regimes in specific bamboo enterprise by villages. Male school children often find piece works at the workshops, which are used for their petty cash needs, e.g., buying food at break periods, participating in social tea clubs and buying clothes. This lifts the burden on their parents whose incomes are very low and uncertain. It was also shown that furniture making contributed to the highest portion of casual labour provision as opposed to bamboo vending, which indicated low opportunities for casual labour. These casual labour opportunities were highest in Katengeza village and lowest in Chilombo village. Of the respondents, 20% indicated that family labour is used in the bamboo enterprises. The family labour meant that a member of the household was obliged to participate in the particular bamboo enterprise. Use of family labour was highly pronounced in Chilombo village. Women and children were also involved in extracting bamboos from Thuma Forest Reserve and selling them. Access to Thuma Forest Reserve was found to be gender-neutral in Chilombo village, unlike in all furniture workshops which were dominated by men.

Seasonality of labour

Involvement of bamboo enterprises reached climax during the dry season. On average, bamboo enterprises had annual active period of 8–10 months. The remaining 2–4 months were devoted to rain-fed farming. However, a chi-square test showed that there were significant differences of commitment to bamboo enterprises during rainy season among the villages ($\chi^2 = 33.7$, d.f. $= 8$, $P < 0.001$). It was found that in Chilombo village mostly bamboo culm vendors had less commitment to their culm collecting enterprise during rainy season than the bamboo handicraft making villages. One of the factors contributing to less commitment was that the Lilongwe River became impassable due to heavy flows. They were also afraid of elephants in Thuma Forest Reserve. About 32% of the bamboo

entrepreneurs committed all of their time, capital and labour to farming during the rain season. Only 8% of the respondents admitted to commit totally to bamboo enterprises, i.e., working full time on the particular bamboo enterprise. Some bamboo entrepreneurs ventured into partial commitment to bamboo enterprise in December–March, because it is the leanest period in food security in Malawi. Therefore, bamboo entrepreneurs engaged on part-time basis to provide income for their households. Bamboo furniture makers divert to production of baskets and small furniture for quick cash. Bamboo handicraft manufacturing during rainy season relies on the bamboo stocks stored during dry season.

Bamboo workshops

Bamboo workshops acted as a forum for sharing ideas and experiences in craftwork. The workshop club paid MK 2000 (US$ 19) as annual trading tax to Dowa District Council, which collected it biannually. The workshops standardized the quality of the handicraft to create commodity uniformity. A market price was set by the workshop for each commodity manufactured. The owner of the commodity was only involved if the buyer wanted a bargain below the recommended threshold. Usually the owner agreed with the bargain if he needed the money to cater for his urgent household needs.

When one craftsman received a quotation or order in bulk quantities, he hired casual labour (ganyu) from his fellow craftsmen to meet the requirement within agreed period. This is some sort of reciprocity in labour. However, it was found that social cohesion in informal money loans within the clubs did not exist. This was because few households could afford to lend out their household income. Access to formal credit was a problem because handicraft market was seasonal and exogenously dependent on urban dwellers' willingness to pay for the commodities.

Handicraft and bamboo culm buyers

The bamboo handicraft enterprise heavily depends on the external buyers who are urban dwellers and owners of entertainment places. Another group of buyers are tourists and/or foreigners who buy the handicrafts as Malawian souvenirs. The bamboo culm vending for structural construction also depends on estate farmers and urban dwellers. The urban dwellers use the bamboo culms for constructing grass fences. If the taste of urban dwellers and other handicrafts buyers for handicrafts plummets, the future of the livelihoods on handicrafts would be jeopardized. However, the demographic and economic growth of Lilongwe and urban areas would create demand for bamboo handicrafts. It was observed during FGDs that some of the buyers come from areas as far as Mzuzu, Blantyre and Mchinji, 420 km, 300 km and 200 from Mvera, respectively.

Stakeholders in bamboo enterprise and management

Salima District Forestry Office levied entry fees to intruders into Thuma Forest Reserve. The Forest Guards sometimes confiscated bamboos illegally collected from Thuma Forest Reserve. The bamboo entrepreneurs in all villages expressed resentment to the research team as being camouflaged Forest Guards. This sentiment expressed some illegal extraction of bamboos from Thuma Forest Reserve. The Forest Guards also helped in the general management of bamboos in Thuma Forest Reserve by use of controlled bushfires and rotational extraction of bamboos. The Forest Guards assign sites of possible extraction where there are overgrown bamboos and restrict areas where they are young and green. The Wildlife Action Group also maintains the security of bamboo collectors by controlling the route of elephants that are reported to be threatening lives of bamboo collecters. Wildlife Action Group also promotes Thuma Forest Reserve as a tourist site for viewing African bamboos (*O. abyssinica*).

Malawi Chambers of Commerce and Industry (MCCI) invite and encourage the bamboo manufacturers to exhibit their products at the trade fairs. However, local craftsmen expressed dissatisfaction with the arrangements for trade fairs. They complained of high participation fees that were prohibitive for local entrepreneurs. Appropriate Technology Training Unit for Income Generating Activities (ATTIGA) is one of the two technology centres in the Ministry of Gender And Community Services. They trained Chipala women group in bamboo handicraft making through use of mechanical devices, such as bending vice, chemical treatment of bamboo and planting of bamboo plots. ATTIGA had only worked with the Chipala women group within the study area. Forestry Research Institute of Malawi (FRIM) is one the potential external stakeholders that was concerned with research in management of bamboos as stipulated in National Forestry Policy on Non Timber Forest Products. Since bamboo is an under-researched plant in Malawi, FRIM would play a leading role in understanding the biology of bamboos hence better domestication and management of bamboo in individual plots and protected reserves, respectively. The Department of Forestry had also developed a proposal for bamboo resource management and submitted it to potential donors at the time of this research. This shows that research in bamboo and its related uses is gaining ground in Malawi. This would improve the information on bamboo resources and their impact on rural livelihoods and national economy in Malawi. One credit institution recalled by the craftsmen to be Malawi Rural Finance Company (MRFC) carried out its credit feasibility research in Katengeza, but it did not materialize towards provision of credits to the bamboo handicrafts makers. The respondents suggested that credit institutions were not able to give out loans because their market was perceived to be seasonal and risky. The Foundation for International Community Assistance (FINCA) was observed to offer loans to women groups only but none of the women interviewed had obtained loan for expansion of her bamboo enterprise. During need assessment exercise in FGDs, it was frequently mentioned that lack

of credit hindered them from expanding their merchandise. However, among those interviewed none had borrowed money from any credit institutions.

The ruling United Democratic Front government initiated the OVOP program to promote economic activities of Malawians. The program advocates for specialization on economic activities people are efficient on. OVOP identified bamboo handicraft making to be among the economic activities that rural people in Mvera could be engaged in. At the time of research, a group of local manufacturers attended a consultative workshop on possibilities of forming an association of bamboo handicraft makers and modalities of OVOP. If issues of widening markets for the bamboo handicrafts would be promoted, the cash incomes from bamboo handicrafts would increase.

CONCLUSIONS

Bamboo handicraft making and bamboo culm vending are contributing significantly to the livelihood security in the areas studied. Handicraft making showed gender imbalance as it involved mainly males expect in one Chipala women's group, which is not also performing efficiently. Bamboo culm vending involves both sexes. The average bamboo enterprise cash income contribution to household cash incomes was about 6 times the agricultural cash income. This is so because the bamboo entrepreneurs rarely sold their farm produce.

However, average own farm consumption was the highest source of income in kind. It contributed about one and half times as much as average bamboo enterprise cash income. The cash incomes from bamboo enterprise were used for household upkeep (buying food, groceries, transport, hospital expenses), inputs for agricultural production and initial capital for small-scale business (e.g., wood workshop, grocery shop, miscellaneous merchandise). Bamboo handicraft industry has also created a considerable casual labour market in Mvera area. Casual labour at bamboo workshops is an economic activity benefiting other villagers. There are no profound bamboo management practices by the bamboo entrepreneurs in both handicraft making and bamboo culm vending villages. The abundance of bamboos in the nearby Forest Reserve has impeded sustainable management of bamboos by the bamboo-utilizing households. Currently there are no stakeholders working with the communities in sustainable management of bamboos. Thuma Forest Reserve carries out a general fire management of the forest and bamboos are thereby virtually managed. The Forest Guards of the forest reserve also control the entry into the reserve by issuance of bamboo extraction fee to the bamboo-collecting entrepreneurs.

The following external stakeholders were perceived involved in bamboo handicraft industry in one way or another; Malawi Chambers of Commerce and Industry (MCCI), Dowa District Council, Salima District Forestry Office, and Appropriate Technology Training Unit for Income Generating Activities (ATTIGA). Other potential stakeholders identified in bamboo industry were One Village One Product

(OVOP), Department of Forestry, Forestry Research Institute of Malawi, and credit institutions. The major market purchasers of the bamboo handicrafts and the raw bamboo culms were urban dwellers, tourists and owners of entertainment places and estate farms, respectively.

RECOMMENDATIONS

Since studies on bamboos are very rare in Malawi, it would be helpful for the success of bamboo enterprises and its resource management that bamboo should be further researched. The research should be carried out in all possible uses of bamboo. The biology of *O. abyssinica* (the bamboo species found in the study area) should be thoroughly understood to develop appropriate interventions. The mystery of gregarious flowering and death of bamboo culm should also be studied. In this research, bamboos were only used as a raw material for construction of structures. There are a lot of uses of bamboos that support livelihood in both rural and urban sectors.

Since the bamboos in Thuma Forest Reserve are threatened by the growing demand for bamboos, there should be policy interventions in bamboo plantations both at smallholder level and commercial level. Department of Forestry management committee should look into the possibility of co-managing Thuma Forest Reserve with the bamboo culm harvesting communities to avoid wanton harvesting of bamboo. The Department of Forestry should also start managing strategically the bamboos in Thuma Forest Reserve. MCCI can play a vital role in promoting the bamboo handicraft industry. Linkages should be deployed in trade industry to create a conducive trade environment for bamboo, its handicraft industry and other uses not discussed in the paper.

The management of chipapati should also be looked into since it is a complementary raw material in the handicraft industry. It has been shown by the entrepreneurs that the success of bamboo handicraft industry relies on the availability of chipapati. The chipapati is purported not to thrive in Mvera and this makes the supply of chipapati to hail from far places like Salima, 30 to 50 km away from the handicraft making area. Integration of chipapati plantation with bamboo would be desirable.

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