



Gender-Based Differences in the Commercialisation of Rattan and Bamboo as Livelihood Support Option for Rural and Urban Poor in Ghana: Opportunities and Challenges

Martin Amoah, Joseph Asomani, Raphael Kwasi Dzakpasu, Frank Asafuah

Department of Construction and Wood, University of Education, Winneba, Ghana

Email address:

martamoah@yahoo.com (M. Amoah), joeasomani13@gmail.com (J. Asomani), rkdzakpasu@uew.edu.gh (R. K. Dzakpasu), izzapps@gmail.com (F. Asafuah)

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Abstract: This study investigated the gender-based differences in the commercialisation of rattan and bamboo in Ghana, the opportunities available to rural and urban poor communities engaged in the value chain of rattan and bamboo resource and the challenges they face in their quest to earn a living from the industry. Using snowball sampling, 106 actors in the value chain of the industry were sampled from rural and urban communities where rattan and bamboo are harvested, processed and marketed. Questionnaire and semi-structured interviews were the main data collection tools. The results showed that even though males dominate the value chain, females play two important roles: harvesting and supplying of raw rattan and bamboo to processors. Whereas rural males and females are mostly engaged in the harvesting of the resource their urban counterparts are engaged in the processing and marketing of products from the resource. The limited role played by women in the value chain was partly due to their low self-efficacy resulting from gender stereotype and their traditional roles in the home. Those involved in all the stages of the value chain reported daily income of about USD8.00 and this diminishes to 19.8%, 23%, and 36% of it for harvesters, processors and marketers, respectively. The amount accrued to harvesters was found to be lower than the average daily wage of hired labour, suggesting that the commercialisation of rattan and bamboo has not improved the economic status of rural people. Economics of scale and product quality were the main inhibiting factors for successful commercialisation of the resource. Policy interventions aimed at increasing rural participation in the value chain should include removal of gender stigmatization, providing rural artisans with technical and marketing support, and establishing cottage industry as part of effort to integrating rural businesses communities' into local tourism. International visibility of rattan and bamboo industry in Ghana, which thus far has remained poor, requires urgent attention from governmental and non-governmental agencies.

Keywords: Value Chain, Low Self-Efficacy, Gender Stereotype, Economics of Scale, Product Quality

1. Introduction

In the past decade, conservationists and development organizations have directed their research efforts at issues related to exploitation of Non-Timber Forest Products (NTFPs) in the tropical forests because of the general belief that NTFP exploitation in the tropics could serve a dual purpose of providing support for the livelihoods of rural communities and at the same time conserve tropical biodiversity [1, 2, 3, 4]. The support for NTFP production reached its crescendo after a study suggested that the market benefits of timber are marginal compared to those of non-

wood resources [5]. The biodiversity conservation benefits associated with NTFP exploitation has motivated some tropical researchers to conclude that exploitation of NTFPs is more benign than that of tropical timber [5]. Since then the number of NTFP-related studies have surged and most of them have garnered evidence to justify the need for global support for NTFP exploitation [6]. Another study provided sufficient evidence that bamboo has medicinal values and health benefits when used as vegetable (bamboo shoots) [7]. As a result, commercialisation of NTFPs has become the catchword in the NTFP literature in recent times and it is widely considered a beacon of hope for rural communities

especially where these commodities are found.

Studies on the contribution of commercialisation of NTFPs to the reduction of poverty in rural communities have produced mixed results. For example, studies have suggested that the conservation and financial role of NTFP extraction has been simplistically overestimated [8, 9]. Dove [8] contends that the majority of incomes from NTFPs accrued to those involved in the downstream of the value chain. More recent studies [10, 11, 12] have demonstrated that NTFP commercialisation can potentially enhance the livelihoods of the poorest in society. Evidence from studies carried out in South Africa suggests that the minority of NTFP producers obtain incomes equivalent to or greater than the official minimum wage [10, 11]. Another study claimed that poorer households derive greater benefits from NTFPs than wealthy or intermediate households [11]. A more recent study revealed that women in rural communities who have little or no access to education and no productive employment opportunities find themselves learning by doing in NTFP income activities. [13]. Although these case studies attempt to provide evidence that NTFP commercialisation can improve rural livelihoods, it still remains unsettled.

The exploitation of NTFPs has always been associated with the poor and the disadvantaged members of the rural communities [14]. NTFP is said to supplement the income of the rural people especially women during periods of the year where employment is scarce [15]. The success of NTFPs commercialisation should therefore not only be measured in terms of whether the products are marketed nationally or internationally, but also how it has improved the livelihoods of the marginalized, especially women of the rural communities. From this perspective, issues such as access to NTFPs by rural people, acquisition of technical know-how that enables the rural people to participate in value addition, and opportunity for the rural people to participate in the marketing of final products are very crucial when assessing the success of the commercialisation of NTFPs [14].

Even though the rattan and bamboo industry in Ghana is one of the major informal sector activities, issues such as gender roles, income decomposition of actors, and the roles of middlemen in the industry have not been given adequate attention. In this study, an attempt was made to fill this gap by addressing the following questions: (1) what are the gender roles in the commercialisation of rattan and bamboo in Ghana and what constraints do they face? (2) to what extent do middlemen facilitate the participation of rural people in the commercialisation of rattan and bamboo in Ghana? (3) What are the value share of actors in the commercialisation of rattan and bamboo in Ghana, and what policies and strategies can be put in place to increase rural communities' value share? Several reasons are behind the motivation for this study. First, much of the research on rattan and bamboo commercialisation has focused on Asian and South American countries with sparse attention given to the commercialisation of the NTFPs in Ghana though the products are in commercial quantities here. With cultural and socio-economic differences across different geographical

regions, transferring interventions and policy measures borne out of such studies may not be applicable in the Ghanaian context. Second, the rattan and bamboo industry plays a key role in the Ghanaian informal economy [16, 17], and providing up-to-date information on the status of the industry could contribute to its sustainability. Third, the study has theoretical and policy implications. The findings could be used to validate the findings of previous studies on the subject carried out elsewhere. The findings would also afford policy makers the opportunity to re-examine the current management regime of the rattan and bamboo industry and take informed decisions that could bolster the capacity of the industry to contribute meaningfully to rural economy of Ghana.

2. Materials and Methods

Sequential mixed methods were used as a means of expanding on the findings which emerged from the quantitative study [18]. In this study, quantitative data was first collected, analysed and issues emerging from the analysis were studied in-depth using qualitative method [18]. Mixed methods have the advantages of increasing the accuracy of data on hand, providing a more complete picture of the phenomenon under study than would be yielded by a single approach thereby overcoming the weaknesses and biases associated with single approaches. Again it allows researchers to develop the analysis and build on the original data [19, 20].

In the quantitative part of the study, the constraints faced by NTFPs actors were assessed in order of importance using correlation matrix, mean and standard deviation values; estimated the harvesting levels and prices of rattan and bamboo raw materials; and estimated prices of rattan and bamboo-based products and income decomposition of actors in the value chain. The qualitative part of the study was not only directed at seeking answers to "how" questions but also provided the opportunity to get closer to the participants being studied and consequently allowed further insights into the phenomenon under study. For example, a better understanding was possible of (i) the roles of gender in the commercialisation of rattan and bamboo and (ii) what the middlemen mean to the harvesters and processors, how their activities affect the value chain, and the perceptions harvesters and processors hold for middlemen.

3. Sampling and Data Collection

A total of 106 rattan and bamboo harvesters, processors, and marketers were sampled using snowball sampling technique. Snowball sampling is a non-probability sampling used for sampling a hard-to-reach population [20]. It draws its strength from participants' social networks and personal contacts for gaining access to people and is heavily influenced by the initial contacts made by the researcher as this determines the next point of contact [20]. The major weakness associated with this method is that other 'persons'

who are part of the population but are not part of the network may be excluded from being sampled. Heckathorn's [21] recommendation was followed and this made it possible to overcome this problem where more than one initial contact was made to increase the heterogeneity of the characteristics of the participants.

Field data were collected from March, 2015 to Sept, 2015, in Western, Central, Ashanti, and Greater Accra regions of Ghana. These regions were chosen because most of the commercialisation of rattan and bamboo activities are concentrated there [22]. The data collection regime began by first identifying all actors in the value chain through extensive literature search. Harvesters, processors, and marketers were identified as the main actors in the production chain [22] with middlemen acting as facilitators at various stages of the value chain. Two harvesters each from three rural communities were the first points of contact. Through the snowball sampling technique, 25 harvesters in total were sampled. The processors and marketers of rattan and bamboo at various locations using the same sampling technique were further identified. In total 106 actors comprising 25 harvesters only, 6 processors only, 22 marketers only, 40 processors and marketers, 1 harvester and processor, and 12 harvesters, processors and marketers were sampled. Of the 106 actors, about a quarter of them (26%) were from rural communities. The survey instrument included a three-page questionnaire and it focused on numerical data on harvest and price levels of rattan and bamboo material and products. Also included were a 5-point rating scale items that measured the challenges faced by the rattan and bamboo harvesters, processors, and marketers. These items included issues such as access, harvesting, and marketing of rattan and bamboo resource, marketing of rattan and bamboo products, and the role middlemen play in the commercialisation of the resource. Additional items dealt with the demographics of the actors in the value chain. Most of the items were drawn from extant literature on NTFPs [2, 14]. The final stage of data collection regime was qualitative data collection through the use of semi-structured interview protocol. In all, 20 actors (5 harvesters, processors, marketers and middlemen, each) were interviewed using purposive sampling. The interviews were conducted after the quantitative data had been analysed and this allowed for deeper understanding of the issues which emerged from the quantitative study.

4. Data Analysis

The quantitative data were analysed using descriptive statistics (frequency, mean, SD, COV), chi-square test, and Spearman's correlation coefficient and 5 percent levels of significance only were reported. The use of chi square and Spearman's correlation coefficient allowed for assessment of the associations between the demographic variables and the activities of the value chain i.e. whether the value chain was related to gender. The qualitative field notes were categorized into themes and patterns [18, 20] which were integrated into the quantitative data. Verbatim quotes were used, where necessary, to capture some important issues spoken about by the participants [23].

5. Results

The summary statistics of harvesters, processors, and marketers in the rattan and bamboo value chain are reported in Table 1. A higher percentage of males (67.0%) than females (33.0%) are engaged in the commercialization of rattan and bamboo. The commercialization of the NTFPs was dominated by those who have either had primary (36%) or secondary (35%) education while 26% have had no formal education. *Eremospatha spp.* (mfia) (51.4%) and *Lacosperma spp.* (eyie/willo) (28.7%) appear to be the most harvested rattan type. Harvesting, processing and marketing were the three major activities identified in the value chain (Table 1). Those engaged in a single activity comprised of about half (50.1%) of the total and this is made up of 23.6% harvesters, 5.7% processors, and 20.8% marketers. Those engaged in two activities comprised 38.7% and the composition is as follows: harvesting and processing 0.94% and processing and marketing 37.76% while 11.32% of the total artisans were engaged in all the three activities. Gender does make a significant difference in the choice of activity to be engaged in the value chain (chi-square=34.261, $p<0.001$). Females are more likely than males to engage in only one activity: harvesting (40.0% vs. 15.5%) and marketing (42.9% vs. 9.9%) of the rattan and bamboo products while males are more likely than females to engage in two activities: processing and marketing (50.7% vs. 11.4%) or three activities: harvesting, processing, and marketing (16.9% vs. 0.0%). It is worth noting that those engaged in all the three activities of the value chain live in urban communities.

Table 1. Summary statistics of harvesters, processors, and marketers of rattan and bamboo.

Characteristics	N	Gender (%)		Total (%)	Chi-square
		male	female		
Age					
25-35	13	11.8	14.3	12.6	0.230 (n. s)
36-46	49	47.1	48.6	47.6	
47-57	35	35.3	31.4	34.0	
>57	6	5.9	5.7	5.8	
Level of education					
No formal education	28	28.2	22.9	26.4	1.482 (n. s)
Primary	38	38.0	31.4	35.8	
Secondary	37	31.0	42.9	34.9	

Characteristics	N	Gender (%)		Total (%)	Chi-square
Tertiary	3	2.8	2.9	2.8	
Type of NTFP harvested					
Eremospatha spp. (mfia)	19	52.2	50.0	51.4	0.585 (n. s)
Bamboo	4	13.0	7.1	10.8	
Calamus spp.(demire)	3	8.7	7.1	8.1	
Lacosperma spp. (eyie/willo)	11	26.1	35.7	29.7	
Type of engagement					
Harvester	25	15.5	40.0	23.6	34.261 (s)
Processor	6	5.6	5.7	5.7	
Marketer	22	9.9	42.9	20.7	
Harvester + processor	1	1.4	0.0	0.94	
Processor + marketer	40	50.7	11.4	37.76	
Harvester + processor + marketer	12	16.9	0.0	11.32	

n. s=not significant at 5% level; s=significant at 1% level

5.1. Access, Harvesting and Marketing of Rattan and Bamboo Raw Materials

Forest reserves remain a major source of rattan and bamboo, followed by fallow lands, and community forests (Fig. 1). When harvesting from fallow lands, negotiations are made on the amount to be paid to land owners, and this ranges from payment of 10% of the total price of the rattan and bamboo harvested to payment of about USD 11 per trip made. Most of the harvesters have customers to whom they supply the NTFPs upon request. Customers normally give specifications (length and diameter) of the NTFPs and compliance is key to a successful marketing of the products. Non-compliance may attract reduction in price or complete rejection of the product. Harvesters may sell directly to processors or middlemen. Those who sell to processors reported that processors give fair prices to their products and that they have proved to be reliable in terms of payment. However, selling to processors normally requires that harvesters transport the products to their workshops. Those who trade with middlemen do it on purpose.

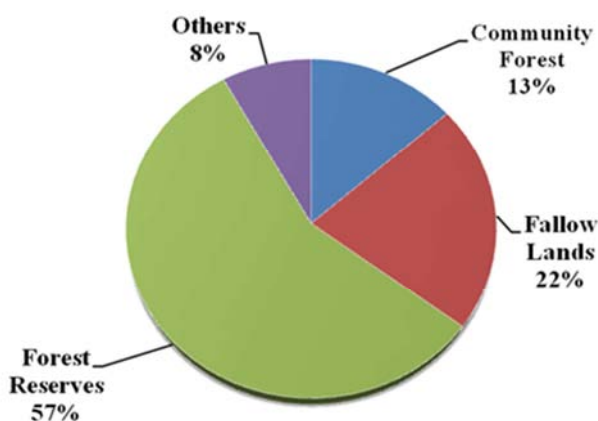


Figure 1. Sources of rattan, and bamboo resources.

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The challenges faced by NTFP harvesters were assessed using a correlation matrix in addition to the mean responses (Table 2). The biggest challenges were having access to rattan resources (mean=3.89) and transporting of rattan and bamboo to the roadside (mean=3.89), followed by access to forest (mean=3.40). Token fee paid to forest guards is made because of difficulty in accessing the forest ($r=0.33$, $p<0.01$) and the rattan and bamboo $r=0.44$, $p<0.01$). Strategies adopted by harvesters to access the NTFPs is to seek assistance from forest guards ($r=0.24$, $p<0.05$), and payment of token to forest guards ($r=0.36$, $p<0.01$). Harvesters use middlemen as a means of avoiding payment of a token fee to forest guards before entering the forest ($r=-0.28$, $p<0.01$) or before harvesting the NTFPs ($r=-0.23$, $p<0.01$). Even though difficulty in marketing NTFPs was reported to be of no major challenge (mean=3.37), lack of prompt payment appears to be a major concern (mean=2.61). Thus, having access to market does not guarantee prompt payment of products sold ($r=-0.29$, $p<0.05$).

Table 2. Spearman's correlation coefficients mean and standard deviation of harvesters' opinions about rattan and bamboo access, harvesting and marketing conditions n=26.

	AF	ARB	HRB	CRB	AM	TFGE	TFGH	FGA	TMAF	ARBF	RBA	PP
AF*	1											
ARB*	.41 ^a	1										
HRB*	.22	.11	1									
CRB*	-.03	.17	.06	1								
AM*	-.07	-.02	.05	.13	1							
TFGE**	.33 ^a	.44 ^a	.18	.13	-.16	1						
TFGH**	.33 ^a	.36 ^a	.14	.07	-.15	.79 ^a	1					
FGA**	.21	.24 ^b	.06	-.17	-.11	.53 ^a	.55 ^a	1				
TMAF**	-.14	-.04	-.24	-.05	.14	-.28 ^a	-.23 ^b	-.10	1			
ARBF**	.12	.07	.06	.05	-.31 ^b	.18	.06	.26 ^b	-.22 ^b	1		
BRA**	-.04	.26 ^b	.02	.23 ^b	.23 ^b	-.15	-.12	-.04	.05	.07	1	
PP**	.15	.12	.34 ^a	-.10	-.29 ^a	.06	.14	.20	-.04	.11	-.03	1
Mean	3.40	3.89	3.12	3.89	3.37	1.94	1.87	1.77	2.36	2.03	3.01	2.61
SD	1.10	1.05	1.04	1.10	1.18	1.54	1.49	1.26	1.62	1.46	1.30	1.25

AF=access to forest; ARB=access to rattan and bamboo; HRB=harvesting rattan and bamboo; CRB=conveyance of rattan and bamboo; AM=access to market; TFGE=token to forest guards before entering forest; TFGH=token to forest guard before harvesting rattan and bamboo; FGA=forest guard assist me to locate rattan and bamboo; TMAF= Through middlemen I access the forest; ARBF=I access rattan and bamboo for free; RBA= rattan and bamboo available in the forest; PP=prompt payment for rattan and bamboo I harvest

Scale * 1=Not difficult at all 5=Very difficult; scale **: 1= strongly disagree 5= strongly agree

^asig. at 0.01 level of probability; ^b sig. at 0.05 level of probability

5.2. Harvesting Levels and Price Distribution of Rattan and Bamboo Raw Material

The distributions of quantities and prices of rattan and bamboo harvested per bundle or truckload are shown in Figures 2 and 3, respectively. The price distribution is in GH¢ with the exchange rate of 3.50 GH¢ per one USD. Visual inspection of the distributions did not reveal any serious deviation from normality. One-sample K-S test was carried out to further assess the normality of the distributions. The resultant p-values for the distribution of quantities of *Eremospatha spp.* (mfia), *Lacosperma spp.* (eyie/willo), bamboo, and *Calamus spp.* (demire) harvested were respectively 0.733, 0.102, 0.197, and 0.266. The corresponding p-values for the one-sample K-S test for the

price distribution were also 0.107, 0.088, 0.607, and 0.399, respectively. This indicates that the normality assumption has not been violated and that the mean is a good descriptor of the distributions. The mean number of bundles harvested per month for *Eremospatha spp.* (mfia), *Lacosperma spp.* (eyie/willo), *Calamus spp.* (demire) and bamboo were respectively, 76.8±38.68, 54.72±33.232, and 28.8±18.612 while the mean number of truckload of bamboo was 2.09±1.20. *Eremospatha spp.* recorded the highest price per bundle (GH¢38.00 ±4.13), followed by *Lacosperma spp.* (GH¢26.60 ±5.72) and *Calamus spp.* (GH¢18.89±4.39).

The truckload of bamboo per month was priced at GH¢98.00±21.78.

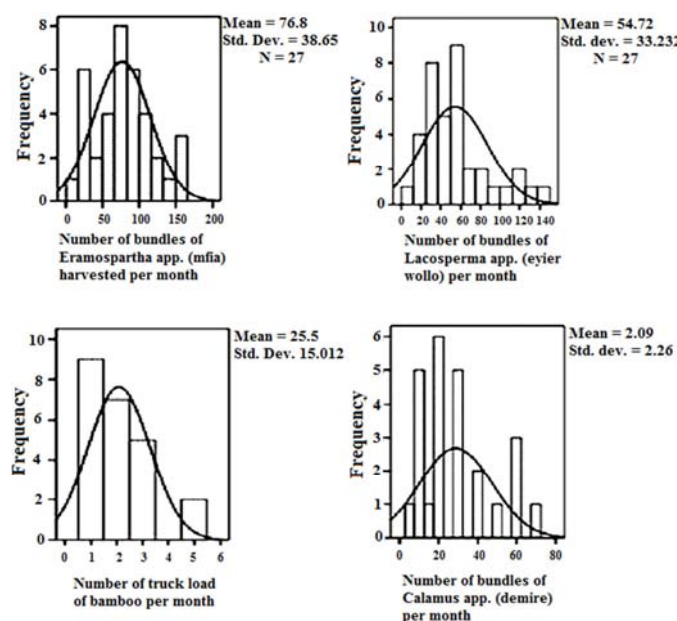


Figure 2. Quantity of rattan and bamboo harvested per month.

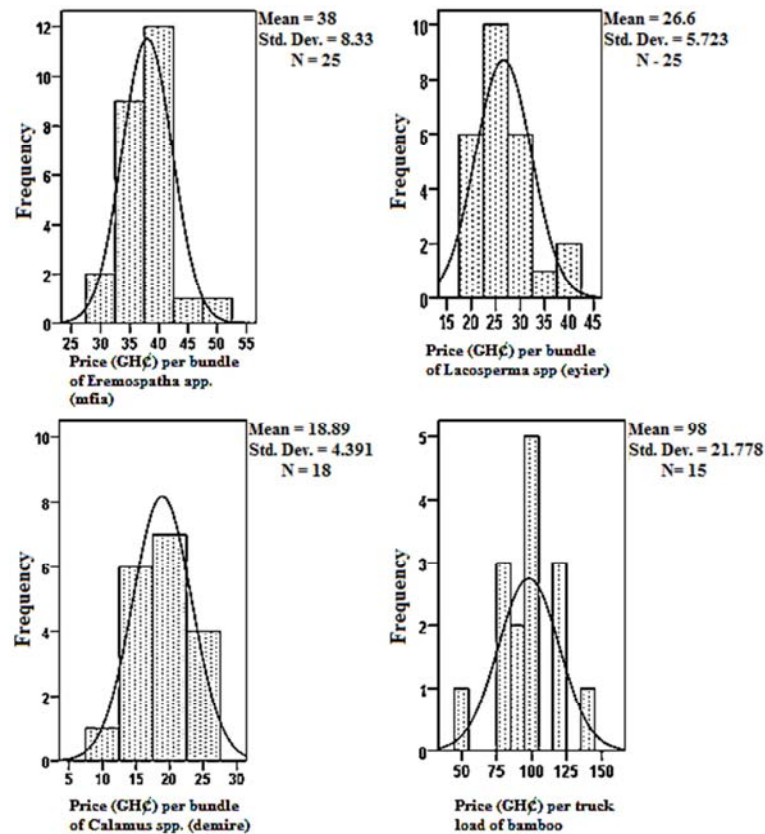


Figure 3. Price distributions of rattan and bamboo (in GH¢).

5.3. Processing and Marketing Rattan and Bamboo-Based Products

Products frequently manufactured from rattan and bamboo are reported in Figure 4. Baskets, beds, and furniture sets are the predominant products processed and marketed: these together constitute about 63% of the total. Table 3 reports the quantity and average unit price of rattan and bamboo products marketed in Ghana. Thirteen products were identified as having been produced and marketed. The number of products marketed per month per artisan ranges from three units of bed to 60 pieces of basket. The average period between end of production and marketing of product also ranges from about five days for dress form to about eight days for room divider. The highest average unit price was

recorded by furniture set (GH¢389.19±62.51), followed by bed (GH¢364.29±72.33), and a set of dining table (GH¢232.58±110.98), while the least average priced products were basket (GH¢3.83±1.29) and wig stand (GH¢1.33±0.50).

A wide range of marketing strategies were reported: 65% of the marketers sell their products at the workplace or workshops, 20% by the roadside, 10% at the market, and 5% by hawking. Products sold on the market are the portable ones and are normally sold by women. Except for basket which is processed by men in the rural communities and used for conveying farm produce, other rattan and bamboo products are processed by men who already live in cities or men who have migrated from rural communities to cities to engage in the business.

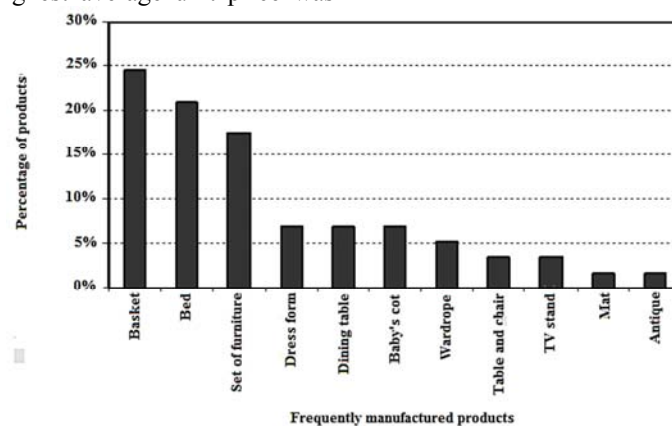


Figure 4. Rattan and bamboo products frequently produced and marketed (N=57).

Table 3. Quantity, period between production and sale, and average unit price of rattan and bamboo marketed in Ghana.

Rattan and bamboo products	Quantity sold per month		*Period between production and sale (in days)		Unit price (in GH¢)	
	mean±SD	COV	mean±SD	COV	mean±SD	COV
Furniture set	3.41±1.691	49.6	6.69±1.508	22.5	389.19±62.511	16.1
Bed	3.03±1.087	35.9	6.82±1.660	24.3	364.29±72.326	19.9
Baby's cot	8.50±9.318	109.6	6.53±1.626	24.9	42.22±7.382	17.5
Basket	60.21±43.998	73.1	5.70±1.944	34.1	3.83±1.291	33.7
Set of dining table	3.92±1.505	38.4	6.85±1.345	19.6	232.58±110.975	47.7
Dress form	31.00±24.065	77.6	5.33±2.024	38.0	34.06±44.355	130.2
TV stand	8.85±4.671	52.8	7.12±1.361	19.1	41.59±6.265	15.1
Wig stand	26.67±11.990	45.0	7.11±1.764	24.8	1.33±0.500	37.6
Mat	20.00±10.00	50.0	7.00±3.000	42.9	10.00±0.00	0.0
Wardrobe	4.67±2.598	55.6	6.89±2.088	30.3	97.78±35.277	36.1
Antilope	5.50±3.109	56.5	6.00±1.732	28.9	72.50±2.887	4.0
Table chair	8.26±3.519	42.6	6.15±1.951	31.7	79.23±20.901	26.4
Room divider	3.50±1.732	49.5	7.75±2.986	38.5	93.33±5.774	6.2

At the time of the study 1USD=2.50GH¢

*This is applicable only during Christmas and Valentine period

6. Discussion

6.1. Gender Roles in the Value Chain of Rattan and Bamboo

Gender roles in NTFPs harvesting, processing and marketing have been a subject of discussion in the NTFP literature [2, 24]. This study has shown that there is a high participation of women in the harvesting and marketing of rattan and bamboo value chain. More than two times women than men were involved in the harvesting of the NTFPs while about four times more women than men were engaged in the marketing of the NTFPs. Despite the strong presence of women in the harvesting and marketing of the NTFPs, men appear to dominate the trade as they are involved in all stages of the value chain. This trend seems to occur as study in Nepal also showed male dominance in the trade [13]. Previous study reports that women are often the primary harvesters, processors and marketers of NTFPs from tropical forests [2]. In the Philippines, apart from performing activities such as scraping, sorting, grading, splitting and drying, women are found to be involved in weaving and fabricating rattans into baskets, backpacks, containers and other handicrafts [25]. There are a number of reasons why the present study did not confirm these observations. First, in Ghana, the processing of rattan and bamboo is done in the cities where there are prospects for the marketing of the products. For women to leave their families to the cities to engage in the processing of the NTFPs means they have to devolve their household responsibilities which may conflict with their traditional roles in the home. Similar observation was made in a study conducted in Papua New Guinea where women missed out on the opportunity to secure employment in a processing plant located in a town distant from the women's household [26]. Second, in Ghana, as a result of stigmatization or gender stereotype, craft and handicraft works have traditionally been the preserve of men as these are considered 'no go area' for women. Consequently, the study of technical-related subjects that would lead to acquisition of technical and manipulative skills in artisanal

works has been male-dominated and females hardly take interest in such subjects. Thus, the issue of women ceding control of processing of rattan and bamboo to men borders on psychological and cultural influences as well as educational orientation of the country. Women found engaging in the processing of rattan and bamboo are on the periphery of the processing activities and only play a supportive role. Key female informants engaged in rattan and bamboo harvesting provided reasons why they are not involved in the processing of these products (Table 4).

Table 4. Reasons quoted by female rattan and bamboo harvesters for non-involvement in value addition.

No.	Quotes
1	I think processing of rattan and bamboo is the job for men and not for women.
2	I do not have time for such work because I cannot add all these to my household works, including feeding my baby.
3	I have no technical expertise and I can see that I lack the ability to learn [this trade]
4	Very difficult to do in terms of bending and nailing
5	Quicker to get money in harvesting than processing.
6	I have no interest in such works
7	I made attempt to learn but I realized I could not work as fast as men do and so I am comfortable with the harvesting.

The male dominance in the marketing of rattan and bamboo-based products became more evident when products sold by male and female entrepreneurs were compared. Females were found to concentrate their marketing activities mainly on raw materials while the males were engaged in the marketing of both raw materials and final products (Table 1). Chi-square test showed that most (73.8%) of the marketers of final products are males and that males are more likely than females to engage in the marketing of final products (Chi-square=21.312, $p=0.030$). It is also worthy of note that females are engaged in the marketing of mainly accessories or handy rattan and bamboo products. Females therefore play a limited role in the marketing of final rattan and bamboo products. Considering the situation that laminated bamboo timber has been tested and found to have good mechanical properties, male dominance will be more pronounced with

time [27]. The paucity of opportunity for females in rural and urban communities to engage fully in the value chain of rattan and bamboo has negative consequences as this missing opportunity has deprived them from receiving higher earnings that would have resulted in increased household income and improved livelihood outcomes.

6.2. Value Share of Actors in the Commercialisation of Rattan and Bamboo-Based Products

The study showed a positive correlation between the income one accrues and the number of stages one is involved in the value chain (Fig. 5): that is, as one participates in all or most of the value chain processes, so does the increase in the income accrued. Those involved in all the three stages reported annual income of GH¢10080 and this diminishes to 19.8%, 23%, and 36% of it for harvesters, processors and marketers, respectively. These amounts are equivalent to an average daily wage of about GH¢13.86 (USD1.57), GH¢6.42 (USD1.83), GH¢5.49 (USD1.57), and GH¢15.25 (USD4.36), for harvesters, processors, marketers and those involved in all stages of the value chain, respectively. The amount received by harvesters is much lower than the normal daily wage of hired labour while that received by those engaged in all value chain activities is more than twice the normal daily wage of hired labour. Judging from the foregoing it is evident that commercialization of rattan and bamboo has not given rural people the opportunity to improve their economic status as they mostly engaged in the harvesting of the resource.

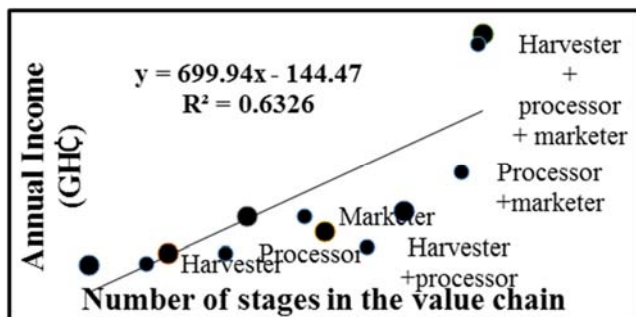


Figure 5. Relationship between annual income and number stages in the rattan and bamboo value chain.

Marshall [14] identified marketing and sale as the major factors limiting the successful commercialisation of NTFPs. In this study, economics of scale, quality of products and mode of advertising products were identified as the main inhibiting factors for successful commercialisation of rattan and bamboo-based products. The rattan and bamboo industry in Ghana has for a long time remained small-scale in nature. Artisans are unable to secure capital to expand their businesses and as a result can only afford to produce in small quantities. Key informants reported that they mostly produce on request and rely heavily on the part payment made by customers to fund most of the production activities. Their inability to secure funds to expand their businesses has stifled their efforts to recruit apprentices to increase production and also provide opportunity for the youth to learn the trade.

Even though processors require simple and rudimentary tools for most of the processing activities, acquisition of simple machine tools could improve the quality of products and increase production. For example, finishing operations that should have been done with simple portable machine tools are being done using manual sanding technique. Parts that should have been connected using decorative screws are being done with nails. The implication is that the Ghanaian rattan and bamboo artisans cannot compete with their counterparts from Asia and elsewhere in terms of product quality and cost and this has resulted in loss of business partners from Europe and elsewhere. At least 20% of the processors interviewed reported that they used to have business partners in Europe and elsewhere but now they have stopped placing orders. Lack of advertising opportunities has also exacerbated the dwindling sales of products. Artisans find it extremely difficult to use modern advertising medium such as radio, TV and the internet to reach out to the larger population and consequently mostly rely on their customers to advertise their products. The processors reported that their customers are mostly tourists, expatriates and those locals who have stayed abroad and that it is only recently that Ghanaians have started patronizing their products.

6.3. The Role of Middlemen in the Commercialisation of the Value Chain

Middlemen have been identified as key actors in facilitating the commercialisation of NTFPs [28, 29]. Their roles become even more crucial where harvesters and consumers are distant apart [28]. Access to NTFPs has been discussed extensively in the literature as the major barrier to successful commercialisation of NTFPs [30, 31, 29, 32, 33]. In Ghana, for example, apart from the community members who live adjacent and around the forest reserves where NTFPs are harvested and therefore have usufruct rights to collect small quantities of rattan and bamboo for domestic purposes, all commercial NTFP harvesters are required to seek permission from the Ghana Forest Service Division and pay appropriate permit fees and royalties on NTFPs harvested [31]. Granting that most of the NTFP harvesters are poor [34] and have also not attained higher level of education and therefore may face challenges in securing permit or advancing royalty, suffice it to say that middlemen's role becomes very crucial. The importance of middlemen at the rural community level where harvesting is done and the urban community level where processing of the NTFPs takes place were identified. At the rural community level, middlemen offer employment to members of local communities by recruiting them to harvest rattan and bamboo. They secure permit either from the Forestry department or chiefs and pay appropriate token to forest guards in order to facilitate easy access of harvesters to the forest for collection rattan and bamboo in commercial quantities as rural collectors have usufruct rights to collect only small quantities for domestic use. At the urban community level, middlemen are the main source of supply of raw rattan and bamboo to processors. Interestingly, most

of the middlemen were found to be women who live in urban centres, suggesting that despite their limited role in the value chain, women play a very important role in the value chain of rattan and bamboo.

Despite their crucial roles, middlemen have been found to be taking advantage of the ignorance of harvesters [34]. Table 5 highlights the positive and negative perceptions harvesters of rattan and bamboo hold for the middlemen they work with. The positive comments about middlemen range from assistance provided to harvesters to secure access to

NTFPs to payment of fair price for products. On the opposite side of the scale, middlemen were labelled as being “uncooperative” in the commercialisation of rattan and bamboo efforts. For example, harvesters were concerned about middlemen not fulfilling tacit agreements, and not giving fair price for products purchased. The processors also appear to have had some negative experiences with middlemen as those interviewed reported non-fulfilment of contractual agreement on the part of middlemen as the most disturbing experience.

Table 5. Perceptions harvesters of rattan and bamboo hold for middlemen.

Positive Quotes	Negative Quotes
1. I work with middlemen because they help me get access to the forest and NTFPs.	Some middlemen do not pay for the NTFPs they buy.
2. I work for a middleman because he pays a token fee to forest guards for them to allow me enter and harvest NTFPs.	Some middlemen delay payment, thus affecting my financial standing.
3. I sell rattan and bamboo to a middle woman because she is reliable in terms of payment.	I used to sell NTFPs to middlemen, but I have stopped because most of them delay payment and some even took my money away making life very difficult.
4. I sell to middlemen because they make prompt payment.	The middleman I work for is not consistent- sometimes I agree on an amount but he later reduces it. But I am satisfied with his transaction.
5. I sell to middlemen because they make my work easier.	Most middlemen do not pay for the services I render to them; others delay payment.
6. I supply rattan and bamboo to middlemen because they give good price.	Middlemen do not give good price.
7. -	Middlemen cheat.

Despite the challenges facing the rattan and bamboo industry, there are numerous opportunities if harnessed could bolster the industry. With depletion of timber resource, products from rattan and bamboo especially rattan and bamboo furniture are increasingly becoming popular at the marketplace. Rattan and bamboo furniture is considered more environmentally-friendly than furniture produced from other materials such as wood, metals and plastics. The consuming public perceive that by patronising the rattan and bamboo furniture, they would contribute to the sustainability of the forest [35].

Additionally, there are a number of policy and institutional initiatives that seek to support and promote the rattan and bamboo industry. The Ghana office of the International Network for Bamboo and Rattan (INBAR) is spearheading the promotion of the industry through research, development, and utilisation of the resource [36]. The government of Ghana under the auspices of the Ministry of Lands, Forestry and Mines has established the Bamboo and rattan development programme (BARADEP) to develop and promote bamboo and rattan in Ghana [37,38]. Another policy intervention aimed at building the capacity of the processors of bamboo and rattan is being sponsored by Ghana government and other development partners. This intervention is focused on the development of a highly qualified and skilled labour force and the acquisition and development of innovative technology towards increased productivity, competitiveness, incomes and employment opportunities [38].

7. Conclusions

Rural communities in developing countries remain the

most vulnerable groups on the globe as their livelihood support alternatives are very limited and are also associated with deforestation and forest degradation. Extraction of NTFPs, which is synonymous with rural poor communities, arguably appears to be the livelihood support alternative that is least destructive to the environment. Commercialisation of NTFPs has therefore been a subject of interest to environmentalists and other development agencies. However, the ability of NTFP commercialisation to contribute meaningfully to the reduction of rural poverty has remained unclear. This study has provided insights into the opportunities available to rural and urban communities who are engaged in rattan and bamboo commercialisation in Ghana and the challenges rural and urban artisans face in attempt to participate fully in the industry. The low participation of women in the enterprise can be blamed on their low self-efficacy resulting from gender stereotype. The educational orientation in Ghana has exacerbated the diminishing opportunities for women to derive maximum benefits from the industry. Policies aimed at removing this stigmatization and providing incentives for women to take up training programmes in artisanal entrepreneurship could enhance women's chances of engaging in all stages of the value chain. Contrary to the findings of studies carried out elsewhere [10, 11, 12], this study has shown that the rattan and bamboo commercialisation in Ghana has not produced the desired livelihood support for rural communities mainly because rural people have not synergized the opportunities available to them. Policy interventions that could be used to increase rural and urban communities' participation in the value chain should include equipping rural artisans with technical and marketing skills, and establishing cottage industry as part of effort to integrating rural businesses into

local tourism. International visibility of rattan and bamboo industry in Ghana, which so far has remained poor partly because of lack of institutional support, requires urgent attention from governmental agencies.

References

- [1] Ruiz-Pérez, M. and Arnold, J. E. M. 1996. Current issues in non-timber forest products research. Bogor, Indonesia. Center for International Forestry. 259p.
- [2] Neumann, R. P., and Hirsch, E. 2000. Commercialisation of Non-Timber Forest products: Rev. Anal. Res., CIFOR. 175p.
- [3] Arnold, J. E. M. and Ruiz-Pérez, M. 2001. Can non-timber forest products match tropical forest conservation and development objectives? *Ecological Economics* 39 (3): 437-447.
- [4] Ambrose-Oji, B. 2003. The contribution of NTFPs to the livelihoods of the 'forest poor': evidence from the tropical forest zone of South West Cameroon. *Int. Forestry Rev.* 5 (2): 106-117.
- [5] Peters, C. M., Gentry, A. H. and Mendelson, R. O. 1989. Valuation of an Amazonian rainforest. *Nature* 339: 655-656.
- [6] Sunderland, T. and Ndoye, O. 2004. Forest products, Livelihoods and Conservation: Case Stud. Non-Timber For. Products Syst. Vol. 2- Africa. CIFOR.
- [7] Hossain, M. F., Islam, M. A., and Numan, S. M. 2015. Multi Purpose Uses of Bamboo Plants: A Review Paper. International Research Journal of Biological Sciences, ISSN 2278 – 3202
- [8] Dove, M. R. 1993. A revisionists view of deforestation and development. *Environmental Conservation* 20: 17-24.
- [9] Southgate, D., Ritchie, M. C. and Canelos, P. S. 1996. Can tropical forest be saved by harvesting non-timber forest products? CSERGE Working paper GEC96-02. 19p.
- [10] Shackleton, S. E. 2006. The significance of the local trade in natural resource products for livelihoods and poverty alleviation in South Africa. PhD Thesis.
- [11] Shackleton, C. M. and Schackleton, S. 2006. Household wealth status and natural resource use in the Kat River valley, South Africa. *Ecol. Econ.* 57 (2): 306-317.
- [12] Shackleton, S., Campbell, B., Lotz-Sisitka, H. and Shackleton, C. 2008. Links between the local Trade in natural products, livelihoods and Poverty Alleviation in a Semi-Arid Region of South Africa. *World Development* 36 (3): 503-526.
- [13] Khanal, M. 2015. Importance of Bamboo in Poors' Livelihood in Nepal. 10th World Bamboo Congress, Korea. Proceedings of a meeting held 17-22 September 2015, Damyang, Korea.
- [14] Marshall, E., Newton, A. C., and Schreckenberger, K. 2003. Commercialisation of non-timber forest products: First steps in analyzing the factors influencing success. *Int. Forest. Rev.* 5 (2): 128-137.
- [15] Lynser, M. B.; Tiwari, B. K.; Nongbri, B.; Kharlyngdoh, E. 2015. Bamboo Mat Making and its Contribution to the Rural Livelihood of Women in South Meghalaya, India. *Bamboo Science & Culture*. 2015, Vol. 28 Issue 1: 23-31. 9p.
- [16] Facolner, J. 1992. Non-timber forest products in Southern Ghana. A Summary Report. ODA Forestry Natural Res. Inst. 235p.
- [17] Tabi-Gyansah, E. 2001. Analysis of the spatial distribution of NTFPs in the tropical forest of Ghana. *ETERN News* 32: 21-22.
- [18] Creswell, J. W. 2009. Research Design: Qualitative, Quantitative, and Mixed Approaches. 3rd Ed. London: SAGE.
- [19] Denscombe, M. 2008. Communities of practice: a research paradigm for the mixed methods approach. *J. Mixed Methods Res.* 2 (3): 270-283.
- [20] Cohen, L., Manion, L., Morrison, K. 2011. Research methods in Education. 7th Ed. London: Routledge.
- [21] Heckathorn, D. D. 1997. Respondent-driven sampling: a new approach to the study of hidden populations, *Social Problems*, 44 (2): 174-199.
- [22] Oteng-Amoako, A., DarkoObiri, B., Britwum, S., Afful-Mensah, J. K., Asiedu, J. and Ebanyenle, E. 2000. A study of the production-to-consumption system of rattan in Ghana. For. Res. Inst. Ghana/ Int. Network for Bamboo and Rattan.
- [23] Patton, M. Q. 2002. Qualitative Research and Evaluation Methods. 3rd Ed. London: SAGE.
- [24] Shackleton, S., Paumgarten, F., Kassa, H., Husselman, M. and Zida, M. 2011. Opportunities for enhancing empowerment in the value chains of three African non-timber forest products (NTFPs). *Int. Forest. Rev.* 13 (2): 136-151.
- [25] Ella, A. B. 2004. Sustainable harvesting of non-timber forest products: the role of gender in the Philippines. Proc. regional workshop for poverty reduction. Beijing, China. 1-2 September, 2003. FAO Corporate Document Repository. <http://www.fao.org/docrep>. Accessed on: 12/6/2012.
- [26] Wissink, D. 1996. Galip (*Canarium indicum*) as a cash crop in West New Britain, Papua New Guinea: experiences of the Kandrian Gloucester integrated development project. In: Stevens MC, Bourke RM, Evans BR (eds). South Pacific Indigenous Nuts, 84-91. Australian Centre for International Agricultural Research, Canberra, Australia.
- [27] Anokye, R., Bakar, E. S., Ratnasingam, N., and Bakar, N. N. 2016. The Effects of Nodes and Resin on the Mechanical properties of Laminated Bamboo Timber produced from *Gigantochloa Scortechinii*. *Construction and Building Materials* 105: 285 – 290.
- [28] TeVelde, D. W., Rushton, J., Schrenkenberg, K., Marshall, E., Edouard, F., Newton, A. and Arancibia, E. 2006. Entrepreneurship in value chains of non-timber forest products. *For. Policy and Economics* 8: 725-741.
- [29] Belcher, B. and Schreckenberger, K. 2007. Commercialisation of Non-Timber Forest Products: A reality check. *Dev. Policy Rev.* 25(13).
- [30] Byron, N. and Arnold, M. 1999. What futures for the people of the tropical forests? *World Development*. 27 (5): 789-805.
- [31] Adu-Anning, C. 2004. The rattan industry in the Ashanti and Western regions of Ghana. In: Sunderland, T., Ndoye, O. (eds). Forest Products, Livelihoods and Conservation. Case Studies of NTFPs systems. Vol.2-Africa. CIFOR.

- [32] Ahenkan, A. and Boon, E. 2010. Assessing the Impact of Forest policies and Strategies on Promoting the Development of Non-Timber Forest products in Ghana. *J. Biodiversity* 1 (2): 85-102.
- [33] Widayati, A., Jone, S. and Carlisle, B. 2010. Accessibility Factors and Conservation Forest Designation Affecting Rattan Cane Harvesting in Lambusango Forest, Buton, Indonesia. *Hum Ecol.* 38: 731-746.
- [34] Evans B. R. 2000 (eds). South Pacific Indigenous Nuts, 84-91. Australian Centre for International Agricultural Research, Canberra, Australia.
- [35] Amoah M. *et. al.* Unpublished.
- [36] Osei-Tutu, P., Nketiah, S. K., Kyere, B. and Owusu-Ansah, M. 2012. Small and medium Forest Enterprises in Ghana. Sourcebook on enterprise characteristics, activity centres, product markets, support institutions and service providers. IIED Small and Medium Forest Enterprise Series No. 28. Tropenbos International and International Institute for Environment and Development, London, UK. 55p.
- [37] Obiri, B. D. and Oteng-Amoako, A. A. 2007. Towards a sustainable development of the bamboo industry in Ghana. *Ghana Journal of Forestry.* 21 & 22: 14-27.
- [38] Skills Development Fund. 2012. SDF awards to four organisations. <http://www.sdfghana.org/new/>.