Non-Timber Forest Products Markets:

Actors And Income Determinants

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ABSTRACT

Trade in non-timber forest products (NTFP) is important in enhancing livelihoods of communities adjacent to forests. However, knowledge about actors and NTFP income determinants in Uganda is scanty. Yet this information is important in targeting profitable NTFP enterprises. This study explored factors that determine involvement in and income from NTFP trade. A survey of NTFP traders was conducted in eleven markets adjacent to Mabira Central Forest Reserve using semi-structured questionnaires. Dominant traders (50%) were females aged above 30 years and with low educational levels. Cross tabulations were done to assess the relationship between NTFP income and several independent variables. Significant variables were then modelled using Logistic Regression which revealed that season of the year, education level, market, nature of stall, level of trade, product and market accessibility were significantly associated with 39% variation in NTFP income (LR chi^2 = 89.35, P = 0.000). Selling processed products from permanent premises was more profitable than

selling raw materials in temporary structures. This calls for skills development in value addition processes and development of permanent NTFP markets in order to obtain maximum benefits from NTFP trade.

Keywords: Socioeconomic, Non-timber forest products, Trade, Mabira, markets, Logistic regression, Market accessibility

1. INTRODUCTION

In areas adjacent to forests, many people do not have access to productive land or formal employment opportunities. This drives such people to harvest forest products for subsistence consumption and income generation. Women are traditionally dependent on forest products to provide additional income through the collection and marketing of NTFP (Akanni, 2013). NTFP are traded in the rural and regional markets in most developing countries (Scherr, White, & Kaimowitz, 2004). These markets are growing as new products enter the market on top of the existing trade. The expansion is driven by both supply and demand factors (Murthy et al. 2005; Shackleton, et al. 2007); increasing integration, market economy and the need for home based income (Barany et al. 2005).

Involvement in NTFP trade varies with the socio-economic characteristics of the traders and market dynamics under which they operate. Forest income is particularly important to the poor and less educated, compared to the rich and educated (Shackleton & Shackleton 2006). NTFP activities generate income especially for women in marginalized rural communities. Trade in NTFP involves small scale activities that require unspecialized skills and low capital investment and often combine well with traditional domestic roles which makes them more attractive to women (Falconer 1996; Fontana et al. 1998). The importance of NTFP in the livelihoods of the marginalized in community may offset inequalities that arise within the agriculture sector (Haggblade et al 2002).

Market proximity and accessibility are known to positively influence dependence on forest income (Kamanga, Vedeld & Sjaastad 2009; Timko, Waeber, & Kozak, 2010). Market access involves processing market information and being able to transfer the product to the market either through direct physical access or an intermediary. Intermediaries (middlemen) play an important role especially in marketing products beyond the local area (Barfade & Paudel, 2008). However, they are often criticized for exploiting the primary collectors.

The importance of NTFP has increased considerably through use within households and generation of income (Ndoye & Tieguhong 2004). NTFP utilisation thus play an important role both in forest conservation if sustainable harvesting is embraced and improvement of livelihoods for forest dwellers when traded. Utilisation of NTFP provides an incentive for participatory forest management (Belcher & Schreckenberg 2007; Belcher 2005); and a possible solution to release the dependence on timber. NTFP have become an important source of sustainable cash income for people living in or near forests (Shackleton, Shanley & Ndoye 2007)).

Unlike timber marketing which is extensively discussed in forestry literature, the knowledge of NTFP marketing is limited especially in developing countries (Ahenken & Boon, 2008). In addition, most studies done relate to products procured for export markets (Claudio 2005); but this may not be important in terms of contribution to rural income and employment of local people living in communities adjacent to forests. Despite the importance of NTFP trade, NTFP markets are informal and dispersed; with no documentation maintained leading to scanty information about contribution of NTFP trade at local and national levels. Consequently, NTFP markets tend to be poorly acknowledged and appreciated despite their importance in income generation for rural livelihoods (Arnold, 1998).

Based on the above background, this study investigated patterns of NTFP trade and factors that influence it. This will contribute knowledge to stimulate a better understanding of the potential of forest products to improve rural livelihoods. Knowledge on the functioning of NTFP markets is important in order to attain efficient performance that is significant to the rural people and in formulation of policies for proper management of the underlying resources by targeting people that heavily depend on NTFP trade.

2. RESEARCH OBJECTIVE

The study investigated the factors that determine the involvement in NTFP trade. This was achieved through the following specific objectives:

– To establish the relationship between socioeconomic characteristics of traders and NTFP income .
– To determine the relationship between market characteristics and NTFP income.
– To determine the relationship between characteristics of traders and product traded.
– To determine the relationship between market characteristics and product traded.

3. LITERATURE REVIEW

The capacity of NTFP to generate income for households can be estimated through conducting surveys of NTFP traded in rural markets in villages neighbouring forests. Until recently, trade in NTFP has not been given much attention compared to timber products (Ngane et al. 2012) because NTFP have been viewed to be of minor importance (Makon, Ngatou, & Ndikumagenge, 2005). However, the importance of NTFP is quite high due to their increased use within households and for income generation (Ndoye & Teiguhong, 2004). Valuation of NTFP markets can be useful while making decisions about land management, land rights and citizen's livelihoods. Data on quantities of NTFP marketed, prices and periodic sales in local markets allows quantification and valuation of trade in NTFP. According to De Beer & McDermott (1989), the development of NTFP commercialization can be achieved if local markets are explored first; before export markets. They contend that export markets are difficult to develop due: to the high product standards expected, rapid changes

in fashion and stiff competition. In addition, direct contact with customers to obtain feedback is difficult to obtain in case of export markets. Local markets are accessible to the poor and play a crucial role in strengthening their livelihoods through increasing their income opportunities (Shackleton, Shanley, & Ndoye, 2007).

NTFP trade is often constrained by factors typical of underdeveloped areas including isolation, limited local buying, inadequate infrastructure, poor access to markets, weak political power, high transportation costs and inadequate education among traders (Belcher, Ruíz-Pérez, & Achdiawan, 2005). Sometimes trade in NTFP is seasonal yet important especially in times of hardships like droughts that lead to low agricultural productivity when NTFP extraction forms a fallback option (Takasaki, Barhan, & Coomes, 2004). During the rainy season, due to accessibility constraints, there is limited activity in NTFP collection and trade (Vodouche, Coulibaly, Assogbadjo, & Sinsin, 2008). Season is an important factor that influences the level of NTFP trade. Studies by Sunderland and Obama (1999) and Ngane et. al. (2012) revealed that high NTFP values were collected during the rainy season when farm work is limited and when food supplies diminish. They further noted that during the dry season labour is diverted to agricultural activities instead of NTFP collection. Despite the benefits from NTFP trade, primary collectors often get fewer benefits compared to middlemen and higher players in the marketing chain (Belcher & Schreckenberg, 2007). In Uganda, charcoal burning, commercial firewood extraction and rattan collection are illegal; but collection of firewood for home is allowed. This limits the amount of legal revenue from such products and instead promoted illegal harvesting and trade leading to revenue loss for local governments and the nation at large.

National policies and rules in Uganda affect the use of NTFP. Forinstance, permit systems were introduced to regulate the collection, trade, processing and marketing of NTFP. Although policy has emphasized the involvement of local people in the management of forest resources, it hardly seems to be effective in reality due to the inadequate implementation and monitoring capacity of authorities. Depletion and overuse of commercial species like rattan have been reported in Uganda [National Environmental Management Authority (NEMA, 2010)]. As a result, rattan traders and carpenters are progressively being forced to use other materials like vines of *Alchornea cordifolia* (NEMA, 2010).

NTFP trade is beneficial to stakeholders in terms of generating income that is used to acquire other household necessities. It is generally the poor and marginalized households that engage in local trade in NTFP and it is particularly important for women (Kaimowitz, 2003; Neumann & Hirsch, 2000). Financial returns form NTFP trade can be substantial contributing more income than formal employment. In developed regions of the world like USA and Europe, NTFP processing and trading activities have prospered and traditional products are appreciated and favoured by both the rich and poor (Cocks, 2006). In West and Central Africa, income from selling NTFP was more than the salary of teachers (Awono et al. 2002; Ndoye & Awono, 2005). In Cameroon the total value of NTFP traded was estimated at USD 19 million; which was approximately 2.8% of the regional economy (Awono et al. 2002). Apart from income generation, NTFP trade saves cash through the supply of

products (Murwendo, 2011). In Uganda, a proportion of trade in NTFP is informal and not recorded at the level of local livelihood (Bush, Nampindo, Aguti, & Plumptre, 2004). Thus, the value recorded for NTFP commercialization is often lower than is actually derived. Therefore, policies geared towards increase in economic returns of NTFP will lead to internalization of forest resource values and an increased incentive for conservation and local forest resource management.

4. METHODS

4.1 STUDY AREA

Mabira CRF lies partly in Buikwe, Mukono and Kayunga districts and occupies an area of 306km^2 with an altitudinal range of 1070 – 1340 m above sea level. It is situated between latitude 0° 22' and 0° 35' and between longitude 32° 56'and 33° 02'E. The study sites were eleven markets in villages adjacent Mabira CFR where NTFP extracted from the forest reserve are traded (Figure 1). These included; Nazigo, Busana, Rwankima, Kitigoma, Mukono, Kyerima, Nakifuma, Ntunda, Kyabazala, Lugazi and Najjembe.

4.2 RESEARCH DESIGN

A market survey of NTFP traders in eleven markets surrounding Mabira CFR was conducted. Semi-structured questionnaires, field observations and key informant interviews were used to gather the required data. Village leaders provided information for classifying markets thus identifying which markets to visit. Consequently, 11 markets that fulfilled the criteria of NTFP availability on market days were selected. Classification of the markets was based on their frequency of occurrence; whether periodic or permanent and NTFP traded in order to attain proper planning for the surveys.

With their consent, all the vendors selling NTFP were counted after a clear explanation of the purpose of the study, and research objectives. Having agreed to participate, the researcher proceeded with the interviews. Due to the likely differences between wet season and dry season in the availability of forest products, surveys were done in the same markets every quarter. A total of 60, 46, 40 and 42 traders were interviewed pro-rata during the four quarters of 2014.

4.3 DATA COLLECTION TECHNIQUES

Data were collected according to slight modifications of Martin (1995). The study commenced with a reconnaissance survey in all the identified markets. This was intended to pretest the questionnaires, gain rapport and build trust among the NTFP traders. Data were collected from 11 markets in March, June, September and December of 2014. A native local language speaker was engaged as a research assistant during the data collection period (Tabuti, Dhillion, & Lye, 2003). The markets surveyed were all within a distance of 6Km from the forest reserve. A short interview was conducted with each seller, using a semi -structured questionnaire. Information was sought on the socioeconomic characteristics of traders and factors that affect traders' access to NTFP markets, products traded and income obtained.

5. DATA ANALYSIS/ FINDINGS

Cross tabulations were used to analyse the relationship between NTFP income groups (below and above the median) and each of the independent variable. Significant variables were further modelled using logistic regression analysis with NTFP income groups as the dependent variable. Independent variables were; age, sex, education level, marital status, employment status, market, nature of stall, product and market accessibility were.

A market access index was constructed for each trader using distance to the market, type of transport used, availability of developed road network and transport cost, as indicators. Information on these variables was collected from traders in each market during the interviews. The scores attached to each indicator are indicated in table 1. Each market was assigned a rank of 1 to 11 based on the ascending order of market access. Traders from villages near the market, with developed road network, access to transport facilities and low transport charges, were assigned a higher ranking. The average score of all index values for each trader was used as a market access index. A higher score implied a higher market access.

5.1 FINDINGS

5.1.1 CHARACTERISTICS OF NTFP TRADERS

Females were dominant in all the quarters, comprising more than 50% of all the traders. A majority of the traders were above 30 years of age and had attained only up to ordinary level of education. NTFP traders had low education levels according to formal education levels in Uganda as laid out by the Ministry of Education and Sports. On average, 22% of the traders had no formal education, 45% had attained primary level, 29% ordinary level and 16% Advanced level and no traders had attained tertiary/University level of education.

Traders were both married and unmarried while a few were either widows or orphans. About 35% of the traders derived their livelihood from NTFP trade only, while 65% engaged in other activities like agriculture, trade in other merchandise and formal employment, in addition to NTFP trade.

There was variation in the number of NTFP traders per quarter at 60, 46, 40 and 42 in ascending order. These numbers were influenced by weather conditions prevailing at the time of the survey. The first quarter was a dry season while the second, third and fourth quarters were characterized by rainy conditions; and the markets therefore had reduced numbers of traders.

The age of traders was significantly associated with the product traded (Pearson $X^2 = 85.1094$, Pr = 0.04). Half of the traders below 19 years and those between 19-30 years traded in *Raphia* strings, 22% of traders above 50 years traded in palm leaves and 22% of traders between 41-50 years traded mainly in mats. The sex of traders was significantly associated with product traded (Pearson $X^2 = 83.3838$, Pr = 0.000).

A majority of the males (30%) traded in *Raphia* strings, whereas most of the females (29%) traded in mats. Though female traders were dominant in all quarters, products traded were highly restricted according to sex.

Mats, baskets, firewood, brooms and palm leaves were commonly sold by women, while the men majorly traded in *Raphia* strings, charcoal, mingling sticks, stools and tool handles. Palm leaves were sold by only women; but their harvesting was done at a cost by men due to their location deep inside the forest. NTFP traders possessed between 5 months to 10 years experience in the business of gathering and selling NTFP. More than 25% of the traders of palm leaves and *Raphia* strings had been in the business for more than 10 years. About 26% of *Raphia* traders had engaged in the activity for less than a year indicating an increasing interest in the product.

5.1.2 CHARACTERISTICS OF SURVEYED MARKETS AND PRODUCT TRADED

Permanent stalls were 16% of the 179 stalls surveyed, 63% were temporary and 21% of the respondents traded on an ambulatory basis. Mukono, Kitigoma, Kayanja and Rwankima markets operated daily and the rest were periodic occurring once a week or once a fortnight. Mukono comprised mostly of permanent stalls while Kitigoma, Kayanja and Rwankima were road side markets, with no established structures. There was a significant relationship between the nature of stall and product traded (X^2 = 125.5709, d.f. = 32, P = 0.000). About (38%) of permanent stalls had firewood, 21% of temporary stalls had palm leaves and 41% of traders that operated on an ambulatory basis sold mats, baskets and *Raphia* strings. Permanent stalls contained high value finished products like, musical instruments, crafts and rattan furniture. Mingling sticks, palm leaves and stools were sold mainly in temporary stalls.

The level of trade was significantly associated with the products sold (X^2 = 103.8366, d.f. = 64, P = 0.001). About 27% of wholesalers sold *Raphia* strings and 13% sold firewood, while 50% of the processors and 28% of retailers sold mats. In general, the majority of the traders in all markets were retailers (45%),   27% of the traders were involved at all levels of the production and marketing chain. Only 7% of traders were wholesalers, and a minimum number were involved as primary collectors only. Mukono market had the highest number of products (27).

There was a significant variation between the products traded in different markets (X^2 = 600.8443, d.f = 176, P = 0.000). Vendors in Kayanja specifically sold charcoal, while those in Rwankima and Kitigoma traded only in firewood. Traders in Mukono mainly sold finished products like musical instruments, household items and handicrafts. Mukono, Lugazi and Nakifuma markets had many traders in the third quarter compared to the other markets; while Kayanja, Kitigoma and Kyerima had more traders in the first quarter. Rwankima had the least number of traders in all quarters since the market specialized in the sale of only one product (firewood).

5.1.3 FACTORS THAT AFFECT NTFP INCOME LEVELS

The mean net annual income from NTFP was $ 1,123.516 with a median of $ 352.64 and thus a huge variation that is highly positively skewed (skewness = 5.939). This implies a high income inequality within the area. The data was thus classified based on the median to divide the sample into two equal levels in order to explain the variation in NTFP income with other characteristics of traders and market. Significant variables in the bi-variate analysis were regressed against NTFP income.

Cross tabulations (Table 3) for each of the independent variables and NTFP income (dependent variable) revealed a significant relationship for the product traded, market accessibility, nature of the stall, quarter of the year, education level of traders and level of trade with NTFP income at 90%. Age, sex, length of stay in business, employment and marital status of traders, did not significantly affect NTFP income.

The significant variables were used in the binary logistic model and explained 39% of the variation in income. The model was satisfactory (R^2 = 0.39, P = 0.000) as illustrated in Table 4. Each of the potential determinants of income is further described below.

More than 60% of the traders in March and December earned more than median income compared to 48% and 40% in June and September respectively. NTFP income was significantly related to the season of collection (Pearson X^2 = 6.427, Pr = 0.091). This result was further confirmed by the Logistic Regression model. NTFP traders in the months of June and September were likely to obtain lower NTFP incomes than traders in the March and December (Table 3).

There were no significant differences in NTFP income according to differences in age groups. However, unlike the rest, more traders (53%) aged above 50 years earned less than the median while more than half of the traders aged between 19-50 years obtained NTFP incomes above the median.

There were no significant differences in the respondents' income levels according to differences in marital status. However 59% of the widowed traders earned less NTFP income than the median; compared to the married and single traders who earned above the median.

There was not enough statistical evidence to conclude that unemployed or employed respondents obtained significantly different incomes from NTFP trade. It is likely that respondents having other livelihoods did not influence NTFP income.

Respondents with higher levels of education earned more income than the rest. The higher the education level, the more the size of respondents who earned more than the median as seen from table 3. However from the logistic regression (Table 4), it is likely that there is no differences in incomes by education levels. There is not enough evidence to conclude significant group differences as illustrated in Table 3.

The market did not significantly determine the amount of income from NTFP trade (Pearson Chi^2 = 18.84, Pr 0.064) as seen in Table 3. From the logistic regression model, traders in Kyerima market obtained significantly different incomes than traders from Nazigo market. A respondent from Kyerima market is more likely to earn less income than a respondent from Nazigo market. However there is not enough evidence to conclude that respondents from the other markets other than Kyerima earn incomes different from traders in Nazigo market.

There was enough statistical evidence to conclude that the size of respondents by income levels was different for different stall types indicated in Table 3 (Pearson Chi^2 = 10.4691, Pr = 0.005). About 79% of traders with

permanent stalls obtained income above the median compared to 57% ambulatory traders and 46% of traders with temporary stalls. However, from the logistic regressions in Table 4, there is no enough evidence to conclude that vendors with different stalls are likely to earn different incomes.

Sex of the respondents had no significant Chi-square statistic; however, more females (66%) earned above the median income compared to males (29%). There was no enough statistical evidence to conclude that vendors' time in business affected the NTFP income earned, however fewer traders (46%) that had been in business for 6-10 years earned more than the median income.

The level of trade significantly affected the income earned. The number of vendors earning more than the median were different according to their levels of trade (Pearson Chi^2 = 2.3295, Pr = 0.675) (Table 3). About 83% of the processors obtained NTFP income above the median, compared to 52% of retailers; and 60% that were involved along the whole production and marketing chain. The majority (64%) of primary collectors earned below median income.

There was a significant relationship between the product traded and income earned (Pearson Chi^2 = 50.009, Pr 0.000) as reflected in Table 3. The majority of traders who sold finished products like decorative items, music instruments, mats and baskets, plus those who sold charcoal and firewood, obtained income above the median. However for some products like fruits, mingling sticks, *Raphia* strings, brooms and stools, income obtained was below the median. Hence, the type of product traded determines the income earned. Similarly, there were differences in the levels of incomes earned in relation to the product traded.

There was enough evidence to conclude that vendors who earned more than median income could easily access the market (Pearson Chi^2 = 4.1602, Pr 0.04). A majority of traders with easy access to markets (64%) earned income above the median; while the majority of traders (52%), who had difficulties accessing the market, earned income below the median (Table 3). Logistic regression model (Table 4) revealed not enough evidence to conclude that market accessibility influences the level of income earned from NTFP trade.

Logistic regression results suggest that there is a no relationship between socioeconomic characteristics of traders and NTFP income earned. In addition the analysis revealed a relationship between market characteristics and NTFP income. Therefore the product sold, level of trade, market where products are sold and season of the year (quarter) can be used to specify the income earned from NTFP trade.

5.2 DISCUSSION

5.2.1 TRADER'S SEX AND NTFP TRADE

Both men and women engaged in NTFP trade but females dominated the activity in all the four quarters being more than 50% in the surveyed markets. Other studies have reported similar trends (Barirega, Tabuti & Van Damme 2012; Obua, Agea, & Ogwal 2010) in Uganda, (De Caluwe, 2011) in West Africa, (Awono, Ndoye & Preece, 2010) in Cameroon and (Aiyeloja, Oladele & Ezeugo, 2012) in Nigeria. In Uganda, women constitute

the backbone of household economy (Agea, 2010). The high presence of women in NTFP trade points to the reality that this activity is an important livelihood coping strategy to generate household income. Promoting NTFP trade could, therefore result into improved livelihoods for the households of NTFP traders in rural areas especially those headed by women.

The study depicts a differentiation in NTFP marketing activities according to sex with regard to palm leaves. Men extracted the product from the forest on behalf of women at a cost; but women processed palm leaves into marketable products such as mats and baskets, which were later sold on market days. The weaving of mats, bags and baskets are compatible with child rearing and other household chores done by women at home. This greatly influences the involvement of women traders in the processing and trade of these products. It is argued that a large percentage of women's involvement in NTFP trade is facilitated by easy access to the forest and low thresholds of skill and capital required (Asfaw et al. 2013). A study in Africa revealed that income from NTFP is more important to rural women than men (Shackleton & Shackleton, 2006); this explains their heavy involvement in the trade. NTFP trade is traditionally considered a marginal activity reserved for women and children and is not attractive to men. The traditional division of labour within a household also leads women to specialize in the sale of NTFP while men specialize in high value business ventures like sale of timber. Camou-Guenero et al. (2008) reported differences in preferences for useful plant species as well as a general interest in forest resources among men and women.

5.2.2 AGE AND NTFP TRADE

The age of NTFP traders varied between 14 to 75 years with a mean age of 41 years. The same observation was also made in Sarele Nigeria (Agbogidi, 2010); with traders of between 30-50 years being dominant in NTFP trade and in Nigeria (Aiyeloja et al., 2012); where a majority of NTFP traders were aged between 31-40 years. Age is a vital factor since NTFP trade involves expenditure of energy and travelling for long distances in search of the products. As such young traders tend to get more resources from the forest than older traders. Collection of valuable forest products can be an accumulation strategy to establish a household by the young people. Older people lack the needed physical strength to gather resources from the forest as harvesting these resources usually demand a lot of energy. On the other hand, some young people consider forest product collection old-fashioned. In addition, they may lack the necessary skills and experience as compared to old people. The collection of forest products, which involves long walks and carrying heavy loads, can be labour intensive. Furthermore, if the collection of forest products from protected forests is restrictive, elderly people will less likely take the risk of entering into these areas. Young adults are more likely to undertake labour-intensive and risky activities; hence their heavy involvement in NTFP trade. Hence, age is expected to have a negative contribution to NTFP income. On the other hand, older people possess more detailed knowledge of NTFP than the younger generation (Camou-Guenero et al. 2008). Because the harvesting of firewood and

charcoal is prohibited by National Forestry Authority (NFA), only energetic people, who can easily dodge forest patrol guards, tend to be attracted to their harvesting and trade leaving out old and weak individuals.

5.2.3 EDUCATION LEVEL AND NTFP TRADE

NTFP traders tend to have low education levels. Better educated individuals have access to a wider range of income generating opportunities and do not find it sufficiently rewarding to get involved in collecting forest products. Previous studies have shown education to reduce dependence on forest products (Illukpitiya & Yanagida 2010; Mamo et al. 2007). However, in the current study an opposite trend was observed. This could be attributed to the fact that in general traders in the study area had low education levels which renders them unemployable on technical jobs that require specialized skills. This intensifies the involvement of uneducated people in NTFP activities where less skill is required. Other studies, however, have indicated that more education is related to more success in NTFP commercialization (Malleson et al. 2014; Willem te velde, 2004).

5.2.4 LEVEL OF TRADE AND NTFP INCOME

Some individuals were involved along the whole supply chain, from harvesting to final selling of NTFP, which improved their profit margins; as was similarly observed in South Africa (Shackleton 2005). Wholesalers received higher value from NTFP trade compared to retailers and primary collectors. As expected, profit margins for wholesalers, transporters and exporters are often quite high. This could be an indicator of exploitation of producers by middlemen. Primary collectors are subject to high levels of exploitation which keeps them in a powerless position. There is often a big difference between the price the primary collectors receive and the final price of the product on the market. This implies that shortening the marketing chain would leave more of the NTFP value in the hands of primary collectors. However if costs borne by intermediaries and the functions they perform are considered, the differences between purchasing and selling prices would be less exploitative (Neuman & Hirsch 2000). Several costs are incurred by intermediaries between the points of purchase and sale, including: transport, storage, taxes, packaging and salaries. If intermediaries are by-passed, primary collectors would be exposed more directly to risks of the trade like: price fluctuations, bureaucratic requirements including permits and unofficial payments (bribes) which are at times required to transport NTFP to the market, which reduces the value obtained from NTFP trade (Kusters 2009). High profit margins were obtained for traded NTFP in similar studies in Uganda (Barirega et al. 2012; Tugume et al. 2016) which indicated minimal exploitation of primary collectors by middlemen. The current finding contradicts the general belief that final sellers exploit producers (Neuman & Hirsch 2000). In the current study, 27% of the traders directly sold their products; thus they received maximum benefits. Since NTFP was profitable at all levels, it's not necessary to eliminate middlemen completely. Direct selling of final products results into greater income per product sold, and this may act as an incentive to harvest the species sustainably.

5.2.5 CHARACTERISTICS OF MARKETS

Permanent structures offer secure storage space, thus owners of such stalls engage in trade of many high value products. The permanent structures also facilitate a consistent supply of products that continually attract potential buyers eventually leading to high sales. For instance crafts traded in Mukono market, that predominantly has permanent stalls for NTFP, attract tourists along the Kampala- Jinja highway. Similar trends were reported in South Africa (Pereira, Shackleton & Shackleton, 2006; Shackleton, 2005).

High market access increases income from NTFP trade due to the reduction in transport costs; and at the same time it facilitates easy movement of products in large volumes to the market. Poor market access may limit forest resource availability as a source of income. It is generally believed that good market access may imply less forest dependence because alternative income opportunities are abundant. But the point that good access to markets and high prices of some forest products can influence some individuals to specialize in high value environmental products challenges this assumption. Access to outside markets may influence forest resource extraction in different ways. On one hand, access to markets may open up better employment opportunities, thereby decreasing dependence on forest resources. On the other hand, market access may facilitate commercialization of forest resources, and thus provide an incentive to extract more. High extraction rates of some species is likely to result into forest degradation, and eventual species extinction; especially for highly demanded plant species in the study area like *Markhamia lutea, Phoenix reclinata, Calamus* sp and *Ficus natalensis*. Therefore, it is hard to determine, a priori, the impact of market accessibility on forest resources.

5.2.6 EFFECT OF CLIMATIC CONDITIONS ON NTFP TRADE

Climatic conditions affected the availability of and accessibility to forest products. This led to variation in the number of traders and NTFP volumes at the time of the surveys. The rainy season was associated with floods that made it difficult to harvest some products like *Raphia* from the forest. Wetting of palm leaves during the rainy season causes spoilage and reduction in their value acting as a deterrent to their harvest. Rainy seasons also offer suitable conditions for planting crops; so most people in such periods revert to agriculture instead of NTFP harvesting. All these reasons resulted into fewer traders in the first, second and third quarters, and hence a low supply of products on the market. During the dry season, when no planting is taking place, many people engage in NTFP harvesting because the forest is accessible; making harvesting of raw materials easy. Thus NTFP trade seems to be undertaken when demand for farm work is low, supply of raw materials high, and sources of raw material easily accessible. Other studies have reported a low availability of NTFP on markets during the rainy season (Shit & Pat, 2012; Vodouche et al. 2008). Findings from the current study contradicts those of Mallerson et al. (2014) which indicated that many NTFP related activities are carried out during the rainy season. A study by Ngane et al. (2012) in Cameroon similarly reported high volumes of NTFP collected during the rainy season; because of less work on farm.

6. CONCLUSION

NTFP markets are mainly run by women offering them an employment opportunity and a source of income used to obtain other household necessities. On the average, 47 traders were engaged in NTFP trading in the surveyed markets. Young energetic persons were more involved in NTFP trading compared to the elderly. Processed products earned more income compared to raw materials. Charcoal, firewood and tool handles also had high returns; but harvesting and trade in these products has to be approached with caution to avoid overexploitation of the plant species used in their production. It is worthwhile to engage in NTFP processing to obtain higher returns through value addition. The influence of seasonal shocks on NTFP income underscores the importantance of alternative survival means during such periods. Trading from permanent structures results into higher returns.

7. RECOMMENDATION

In order to maximize the benefits from NTFP trade, traders should engage in NTFP processing to add value to their products. In the study area, focus should be placed on production of musical instruments, crafts like mats, baskets, racks instead of selling raw materials. NTFP should be sold from permanent structures that are highly secure in terms of storage and which facilitate constant supply of high value NTFP as and when required. Furthermore, NTFP traders need to maintain short marketing chains avoiding middlemen if they are to maximise profits. Since most NTFP traders had low education levels, programmes that provide skills enhancement in value addition should be implemented targeting such categories of people that were highly dependent on NTFP trade and associated activities. This will promote value addition of traded products which will generate high revenues.

8. REFERENCES

Agbogidi, O. M. (2010). Ethnobotanical survey of non-timber forest products in Sapele Local Government Area of Delta State, Nigeria. *African Journal of Plant Sciences, 4*(3), 183-189.

Agea, J. G. (2010). Use and Potential of Wild and Semi-wild Food Plants Traded in Bunyoro- Kitara Kingdom, Uganda. Ph.D. thesis, School of Environment, Natural Resources and Geography, Bangor University, United Kingdom.

Ahenken, A., & Boon, E. (2008). Enhancing food security, poverty reduction and subsistence forest Management in Ghana through non-timber forest products farming: Case study of Sefwi WIawso District. GRIN publishing at www.grin.com/de/preview/.html

Aiyeloja, A. A., Oladele, A. T., & Ezeugo, O. E. (2012). Evaluation of non timber forest products trade in Ihiala local government area, Anambra State, Nigeria. *International Journal of Science and Nature., 3*(2), 366-372.

Akanni, K. A. (2013). Economic benefits of non-timber forest products among rural communities in Nigeria. *Environment & Natural Resources Research, 3*(4), 1-19.

Arnold, J.E.M. 1998. (eds) Current Issues in Non-timber Forest Product Research. CIFOR/ODA, Bogor, Indonesia. pp. 143-160.

Asfaw, A., Lemenih, M., Kassa, H., & Ewnetu, Z. (2013). Importance, determinants and gender dimensions of forest income in the eastern highlands of Ethiopia: The case of communities around Jelo Afromontane forest. *Forest Policy and Economics, 28*, 1-7. doi: http://dx.doi.org/10.1016/j.forpol.2013.01.005.

Awono, A., Ndoye, O., & Preece, L. (2010). Empowering women's capacity for improved livelihoods in non-timber forest product trade in Cameroon. *International Journal of Social Forestry., 3*, 151-163.

Barany, M., Hammett, A. L., Leaky, R. R. B., & Moore, K. M. (2005). Potential income generating opportunities for smallholders affected by HIV/AIDS: Linking agro-ecological change and non-timber forest product markets. *Journal of Management Studies, 39*, 26-39.

Barirega, A., Tabuti, R. S., & Van Damme, P. (2012). Potential commercialisation and value chain improvement of wild foods and medicinal plants in Uganda. *Journal of Biological Sciences, 4*(2), 108-116.

Banjade, M.R., Paudel, N.S., 2008. Economic potential of non-timber forest products in Nepal: myth or reality? Journal of forest and Livelihood, 7 (1), 36-48.

Belcher, B. M. (2005). Forest product markets, forests and poverty reduction. *International Forestry Review, 7*(2), 82-89.

Belcher, B., & Schreckenberg, K. (2007). Commercialisation of forest products: A reality check. *Dev Pol Rev, 25*, 355-377.

Camou-Guenero, A., Reyes-Garcia, V., Martinez-Ramos, M., & Casas, A. (2008). Knowledge and use value of plant species in Raramuri Community: A Gender perspective for conservation. *Human Ecology, 36*, 259-272.

Claudio, O. D. (2005). Not just Minor forest products. The Economic rationale for the consumption of wild food plants by subsistene farmers. *Ecological Economics, 58*, 64-73.

De Caluwe, E. (2011). *Market chain analysis of boabab (Adansonia digitata L.) and Tamarind (Tamarindus indica L.) products in Mali and Benin.* (PhD), Ghent University, Ghent, Belgium.

Falconer, J. 1996. Developing research frames for nontimber forest products. In: Ruiz-Pérez, M. and

Fontana, M., Joekes, S. and Masika, R. 1998. Global Trade Expansion and Liberalisation: Gender Issues and Impacts. BRIDGE Report No. 42. IDS, Sussex, UK. Commissioned by DFID.

Haggblade, S., Hazell, P. and Reardon, T. 2002. Strategies for Stimulating Poverty-Alleviating Growth in the Rural Nonfarm Economy in Developing Countries. Environment and Production Technology Division (EPTD) Discussion Paper No. 92. IFPRI and Rural Development Department of the World Bank, Washington, DC.

Illukpitiya, P., & Yanagida, J.F. (2010). Farming Vs forests: Trade-off between agriculture and the extraction of non-timber forest products. *Ecological Economics*, 69, 1952-1962.

Kamanga, P., Vedeld, P., & Sjaastad, E. (2009). Forest incomes and rural livelihoods in Chiradzulu District, Malawi. *Ecological Economics, 68*, 613-624.

Kusters, K. (2009). *Non-timber forest product trade. A trade-off between conservation and development. Assessing outcomes of non-timber forest product trade on livelihoods and the environment with special emphasis on the Damar Agroforests in Sumatra Indonesia.* Amsterdam: Rozenberg publishers.

Malleson, R., Asaha, S., Egot, M., Kshatriya, M., Marshall, E., Obeng-Okrah, K., & Sunderland, T. (2014). Non-timber forest products income from forest landscapes of Cameroon, Ghana and Nigeria- an incidental or Integral contribution to sustaining rural livelihoods? *International Forestry Review 16* (3).

Mamo, G., Sjaastad, E., & Vedeld, P. (2007). Economic dependence on forest resources. *Forest Policy and Economics*, 9, 916-926.

Martin, G. J. (1995). *Ethnobotany: A methods manual.* London: Chapman & Hall.

Murthy, I. K., Bhat, P. R., Ravindranath, N. H., & Sukumar, R. (2005). Financial Valuation of Non-timber forest products flows in Uttara Kannada District,Western Ghat, Karnataka. *Current Science, 88*(10).

Ndoye, O., & Tieguhong, J. C. (2004). Forest Resources and rurla livelihoods. The conflict between timber and non timber forest products in the Congo Basin. Scans. *Forest Resources, 19*, 36-44.

NEMA. (2010). The state of the environment report for Uganda. National Environmental Management Authority (NEMA), Kampala.

Neuman, R., & Hirsch, E. (2000). *Commercialisation of non-timber forest products. Review and analysis research.* Bogor, Indonesia: CIFOR.

Ngane, B. K., Ngane, E. B., Sumbele, S. A., Njukeng, J. W., Ngone, M. A., & Ehabe, E. E. (2012). Seasonality of Nno timber forest products in the Kupe Mountain region of South Western Cameroon. *Scientific Research and Essays, 17*(18), 1786-1797.

Obua, J., Agea, J. G., & Ogwal, J. J. (2010). Status of forests in Uganda. *African Journal of Ecology*, *48:*853-859.

Pereira, T., Shackleton, C. M., & Shackleton, S. E. (2006). Trade in reedbased craft products in rural villages in Eastern Cape, South Africa. *Development Southern Africa, 23*, 477-496.

Scherr, S. J., White, A., & Kaimowitz, D. (2004). A new Agendas for forest conservation and poverty reduction. Making markets work for low income producers. Forest trends and Centre for International Forestry Research (CIFOR). *Forest Trends*.pp 6-17. Washington DC.

Shackleton, S. E. (2005). *The significance of the local trade in natural resource products for livelihoods and poverty alleviation in South Africa.* (PhD Thesis), Rhodes University, Grahamstown.

Shackleton, C. M., & Shackleton, S. E. (2006). Household wealth status and natural resource use in the Kat River valley, South Africa. *Ecological Economics, 57*(2), 306-317. doi: http://dx.doi.org/10.1016/j.ecolecon.2005.04.011.

Shackleton, C. M., Shackleton, S. E., Buiten, E., & Bird, N. (2007). The importance of dry woodlands and forests in rurla livelihoods and poverty alleviation in South Africa. *Forest Policy and Economics, 9*, 558-572.

Shackleton, S., Shanley, P., & Ndoye, O. (2007). Invisible but viable: recognising local markets for non timber forest products. *International Forestry Review, 9*(3), 697-712.

Shit, P.K., & Pat, C. K. (2012). Non-timber forest products for livelihood security of tribal communities: A case study in Paschim Medinipar District, West Bengel. *Journal of Human Ecology, 40*(2) : 149 -156.

Tabuti, J. R. S., Dhillion, S. S., & Lye, K. A. (2003). Traditional medicine in Bulamogi county, Uganda: Its practitioners, users and viability. *Journal of Ethnopharmacology, 85*, 119-129.

Timko, J. A., Waeber, P. O., & Kozak, R. A. (2010). The socio-economic contribution of Non-Timber forest products to rural livelihoods in Subsaharan Africa: Knowledge gaps and new directions. *International Forestry Review, 12*, 284-294.

Tugume, P., Buyinza, M., Namaalwa, J., Kakudid, E., Mucunguzi, P., Kalema, J., & Kamatenesi-Mugisha, M. (2016). Non-Timber Forest Products trade and community livelihoods around Mabira Central Forest Reserve. *Journal of Agricultural Studies,* 4, (4). Doi:10.5296/jas.v4i4.9482.

Vodouche, F. G., Coulibaly, O., Assogbadjo, A. E., & Sinsin, B. (2008). Medicinal plant commmercialisation in Benin; an analysis of profit distribution equity across supply chain actors and its effect on the sustainable use of harvested species. *Journal of Medicinal Plants Research, 2*, 331-340.

Willem te Velde, D. (2004). Successful Non-timber forest product commercialisation. A quantitative analysis based on household and trader level data. Project funded by UNEP-WCMR & ODI.

9. TABLES AND FIGURES

Figure: 1 Study Area *Location of study sites (markets) adjacent to Mabira CFR. The map shows the the location of Mabira CFR in Uganda and its administrative boundaries.*

9.1 LIST OF TABLES

Table 1: Scores for market access indicators *The table shows indicators that were used to determine the market accessibility index of NTFP users/traders*

Indicator	Score					
	1	2	3	4	5	6
Distance (Km)	5	4	3	2	1	0
Transport cost to markets (USD)	>10	5.1-10	2.1-5.0	1.1 - 2	<1	0
Status of road network	Not Developed	Developed				
Type of transport used	Car	Motor cycle	bicycle	walking		

Source: Researcher generated

Table 2: Variables used in the Logistic regression model and their expected signs. *The operational definitions and a priori expectations of variables, used in the regression analysis to predict factors that determine engagement in NTFP trade and value derived therefrom.*

Variable	Expected sign	Description
Trader characteristics		
Age	±	Age of NTFP trader
Sex	±	Sex of NTFP trader (Male or female)
Education level	-	Education level of NTFP trader(non-formal or formal i.e. primary, ordinary &advanced levels, Graduate
Marital status	±	Marital status of trader (married, single, widowed)
Employment status	-	Whether trader is employed (or have other livelihood activities) or not
Market characteristics		
Nature of stall	±	Physical structures where trade is conducted (temporary or permanent) or ambulatory.
Market access	+	Accessibility of market where NTFP are traded
Level of trade	+	Level of trader in the market chain (Primary collector, retailer, wholesaler)

Source: Researcher generated

Table 3: Cross tabulation of income and the other potential determinants of income (reporting frequencies and row percentages

Variable	Below Median	Above median	Total
Quarter	Pearson chi2(3) =6.472 Pr = 0.091		
	N (%)	N (%)	N (%)
1	19 (37.3)	32 (62.7)	51 (100)
2	24 (52.2)	22 (47.8)	46 (100)
3	24 (60)	16 (40)	40 (100)
4	16 (38.1)	26 (61.9)	42 (100)
Total	83 (46.4)	96 (53.6)	179 (100)
Age(yrs)	Pearson chi2(4) = 1.9125 Pr = 0.752		
	N (%)	N (%)	N (%)
1(<18)	4 (36.4)	7 (63.6)	11 (100)
2(19-30)	12 (41.4)	17 (58.6)	29 (100)
3(31-40)	23 (43.4)	30 (56.6)	53 (100)
4(41-50)	22 (48.9)	23 (51.1)	45 (100)
5(>50)	22 (53.7)	19 (46.3)	41 (100)
Total	83 (46.4)	96 (53.6)	179 (100)
Marital Status	Pearson chi2(4) = 2.8972 Pr = 0.575		
	N (%)	N (%)	N (%)
Single	28 (48.3)	30 (51.7)	58 (100)
Married	43 (42.6)	58 (57.4)	101 (100)
Widow	10 (58.8)	7 (41.2)	17 (100)
Orphan	1 (50)	1 (50)	2 (100)
Total	83 (46.4)	96 (53.6)	179 (100)
Other livelihood activities	Pearson chi2(2) = 0.5725 Pr = 0.751		
	N (%)	N (%)	N (%)
Not employed	55 (45.1)	67 (54.9)	122 (100)
employed	27 (50)	27 (50)	54 (100)
Total	83 (46.4)	96 (53.6)	179 (100)
Education level	Pearson chi2(3) = 6.5745 Pr = 0.087		
	N (%)	N (%)	N (%)
0(Non formal)	20 (57.1)	15 (42.9)	35 (100)
1(Primary level)	42 (50.6)	41 (49.4)	83 (100)
2(O- level)	20 (36.4)	35 (63.6)	55 (100)
3(A- level)	1 (16.7)	5 (83.3)	6 (100)
Total	83 (46.4)	96 (53.6)	179 (100)
Market	Pearson chi2(11) = 18.8403 Pr = 0.064		
	N (%)	N (%)	N (%)
1(Nazigo)	6 (46.2)	7 (53.8)	13 (100)
2(Busana)	8 (66.7)	4 (33.3)	12 (100)
3(Rwankima)	3 (42.9)	4 (57.1)	7 (100)
4(Kitigoma)	6 (50)	6 (50)	12 (100)
5(Mukono)	2 (15.4)	11 (84.6)	13 (100)
6 (Kyerima)	8 (61.5)	5 (38.5)	13 (100)
7(Kyegalaso)	1 (25)	3 (75)	4 (100)
8(Nakifuma)	9 (37.5)	15 (62.5)	24 (100)
9(Ntunda)	9 (52.9)	8 (47.1)	17 (100)
10(Kyabazala)	11 (68.8)	5 (31.3)	16 (100)
11(Lugazi)	19 (50)	19 (50)	38 (100)
13(Najjembe)	1 (10)	9 (90)	10 (100)
Total	83 (23.2)	96 (32.2)	179 (76.4)
Nature of the stall	Pearson chi2(2) = 10.4691 Pr = 0.005		
	N (%)	N (%)	N (%)
1	6 (20.7)	23 (79.3)	29 (100)
2	61 (54)	52 (46)	113 (100)
3	16 (43.2)	21 (56.8)	37 (100)
Total	83 (46.4)	96 (53.6)	179 (100)
Gender	Pearson chi2(1) = 1.2674 Pr = 0.260		
	N (%)	N (%)	N (%)
1	32 (52.5)	29 (47.5)	61 (100)
2	51 (43.6)	66 (56.4)	117 (100)
Total	83 (46.6)	95 (53.4)	178 (100)

Variable	Below Median	Above median	Total
Length of time vendor has spent in the business (yrs)	Pearson chi2(4)=2.3295 Pr = 0.675		
	N (%)	N (%)	N (%)
0	0 (0)	1 (100)	1 (100)
1(<1yr)	13 (39.4)	20 (60.6)	33 (100)
2(1-5)	33 (45.2)	40 (54.8)	73 (100)
3(6-10)	20 (52.6)	18 (47.4)	38 (100)
4(>10)	17 (50)	17 (50)	34 (100)
Total	83 (46.4)	96 (53.6)	179 (100)
Level of trade	Pearson chi2(5) = 10.545 Pr = 0.061		
	N (%)	N (%)	N (%)
0	0 (0)	1 (100)	1 (100)
1(wholesaler)	9 (64.3)	5 (35.7)	14 (100)
2(Processor)	1 (16.7)	5 (83.3)	6 (100)
3(Retailer)	45 (48.4)	48 (51.6)	93 (100)
4(Collector)	4 (100)	0 (0)	4 (100)
5(All levels)	24 (40)	36 (60)	60 (100)
Total	83 (46.6)	95 (53.4)	178 (100)
Distance travelled to look for NTFP	Pearson chi2(4) = 2.5128 Pr = 0.642		
	N (%)	N (%)	N (%)
0	34 (50)	34 (50)	68 (100)
< 1 km	10 (41.7)	14 (58.3)	24 (100)
1-5 km	11 (57.9)	8 (42.1)	19 (100)
> 5 Km	31 (44.3)	39 (55.7)	70 (100)
5	0 (0)	1 (100)	1 (100)
Total	86 (47.3)	96 (52.7)	182 (100)
Product traded	Pearson chi2(20) = 50.009 Pr = 0.00		
	N (%)	N (%)	N (%)
Baskets	5 (33.3)	10 (66.7)	15 (100)
Fruits	2 (100)	0 (0)	2 (100)
Mats	9 (25)	27 (75)	36 (100)
Mingling	1 (50)	1 (50)	2 (100)
Mingling sticks	10 (76.9)	3 (23.1)	13 (100)
Palm lea	2 (100)	0 (0)	2 (100)
Palm leaves	21 (75)	7 (25)	28 (100)
Raffia	26 (66.7)	13 (33.3)	39 (100)
Serving mats	2 (100)	0 (0)	2 (100)
Various	2 (25)	6 (75)	8 (100)
Baskets	2 (100)	0 (0)	2 (100)
Brooms	4 (66.7)	2 (33.3)	6 (100)
charcoal	1 (8.3)	11 (91.7)	12 (100)
Drums	0 (0)	1 (100)	1 (100)
firewood	9 (37.5)	15 (62.5)	24 (100)
Mats	2 (50)	2 (50)	4 (100)
Racks	1 (33.3)	2 (66.7)	3 (100)
stools	6 (46.2)	7 (53.8)	13 (100)
tool handles	1 (100)	0 (0)	1 (100)
tool handles	2 (66.7)	1 (33.3)	3 (100)
winnowing trays	1 (100)	0 (0)	1 (100)
Total	109 (50.2)	108 (49.8)	217 (100)
Accessibility of the NTFP market	Pearson chi2(1) = 4.1602 Pr = 0.041		
	N (%)	N (%)	N (%)
MAI 1-2	58 (51.8)	54 (48.2)	112 (100)
MAI 2.1 - 4	25 (36.2)	44 (63.8)	69 (100)
Total	83 (45.9)	98 (54.1)	181 (100)

Source: Analysis of primary data

Table 4: Binary Logistic Regression model of income from NTFP

Number of obs	=	165					
LR chi2(35)	=	89.35					
Prob > chi2	=	0.00					
Pseudo R2	=	0.39					
Income	Below median Above median	Coef.	Std. Err.	z	Reference P>z	[95% Conf.	Interval]
Quarter of the year of the surve	_IQUARTER_1				Reference		
	_IQUARTER_2	-1.54	0.73	-2.11	0.035	-2.98	-0.11
	_IQUARTER_3	-1.97	0.82	-2.39	0.017	-3.58	-0.36
	_IQUARTER_4	-0.67	0.77	-0.86	0.387	-2.18	0.84
Education level	_IEDUCLEV_0				Reference		
	_IEDUCLEV_1	-0.54	0.67	-0.82	0.415	-1.85	0.76
	_IEDUCLEV_2	0.38	0.79	0.48	0.632	-1.16	1.92
	_IEDUCLEV_3	0.49	1.55	0.32	0.749	-2.53	3.52
Market	_IMARKET_1				Reference		
	_IMARKET_2	-2.50	1.54	-1.62	0.105	-5.51	0.52
	_IMARKET_3	-18.50	1311.75	-0.01	0.989	-2589.47	2552.48
	_IMARKET_4	-18.83	1311.75	-0.01	0.989	-2589.80	2552.15
	_IMARKET_5	-1.52	2.54	-0.60	0.549	-6.51	3.46
	_IMARKET_6	-3.95	1.65	-2.40	0.016	-7.18	-0.72
	_IMARKET_7	-2.15	2.63	-0.81	0.415	-7.31	3.02
	_IMARKET_8	0.70	1.35	0.52	0.601	-1.94	3.34
	_IMARKET_9	-2.12	1.93	-1.10	0.271	-5.90	1.66
	_IMARKET_10	-2.11	1.53	-1.38	0.169	-5.11	0.89
	_IMARKET_11	1.11	1.27	0.88	0.380	-1.37	3.60
	_IMARKET_13	-15.91	3622.20	0.00	0.996	-7115.30	7083.47
Nature of the stall	_ISTALL_1				Reference		
	_ISTALL_2	-1.57	1.00	-1.58	0.115	-3.53	0.38
	_ISTALL_3	1.89	1.44	1.32	0.188	-0.93	4.71
	_ILEVEL_0				Reference		
	_ILEVEL_1	-15.79	3622.20	0.00	0.997	-7115.17	7083.59
	_ILEVEL_2	-14.32	3622.20	0.00	0.997	-7113.70	7085.06
	_ILEVEL_3	-14.18	3622.20	0.00	0.997	-7113.56	7085.20
	_ILEVEL_5	-13.32	3622.20	0.00	0.997	-7112.70	7086.06
	Mats	-0.90	1.60	-0.56	0.576	-4.04	2.25
	Mingling sticks	-5.34	1.96	-2.72	0.006	-9.18	-1.50
Level of trade	Palm leaves	-2.87	1.64	-1.75	0.080	-6.08	0.34
	Raffia	-3.51	1.57	-2.24	0.025	-6.58	-0.44
	Various	-1.48	2.27	-0.65	0.514	-5.93	2.97
	brooms	-4.53	1.89	-2.40	0.017	-8.24	-0.82
	charcoal	14.32	3622.20	0.00	0.997	-7085.06	7113.71
	firewood	14.30	1311.75	0.01	0.991	-2556.68	2585.27
	mats	-0.93	2.49	-0.37	0.709	-5.81	3.95
	stools	-1.42	1.96	-0.72	0.469	-5.27	2.43
	tool handles	0.32	2.02	0.16	0.872	-3.63	4.27
Accessibility of the market	_IMKTACESS_1				Reference		
	_IMKTACESS_2	2.03	1.37	1.48	0.139	-0.66	4.71
Constant	_cons	18.30	3622.20	0.01	0.996	-7081.09	7117.68

Source: Analysis of primary data