



MARKET PERFORMANCE AND UTILIZATION OF *Garcinia Kola* (Heckel) (BITTER KOLA) IN ABIA STATE, NIGERIA

¹Olowoyo, F.B., ²Samson, E.O., ¹Okpara, I.G., ³Nwachukwu, J.Q. and ¹Oyewusi, E.O.

¹Forestry Research Institute of Nigeria, Federal College of Forest Resources Management
Ishiagu, Ebonyi State

²Forestry Research Institute of Nigeria, Rain Forest Research Station Awi, Cross River State

³Forestry Research Institute of Nigeria, Humid Forest Research Station, Umuahia Abia State

Corresponding Author's email: felixolowoyo@yahoo.com

Abstract

This study analysed the marketing performance and utilization of bitter kola in Abia State, Nigeria. One hundred and eighty structured questionnaires were administered on the respondents who were bitter kola producers, marketers and consumers. The data for the study were captured using a structured questionnaire. Multiple regression analysis and cost and returns were estimated. The result of the regression analysis showed that the coefficient of age was statistically significant at 1% and inversely related to value of sales. The coefficient of household size and level of education were significant at 5% and positively related to value of sales. The coefficient of marketing experience was significant at 1% and directly related to value of sales. The coefficient of distance was statistically significant at 10% and inversely related to value of sales. The result of the cost and returns shows a monthly revenue of N39,760 for bitter kola and a Net return of N13,403.01. Benefit cost ratio for marketers was 1:1.51, which implies that every one naira spent about N1.51 was returned to the kola marketer. The most severe constraint to bitter kola marketing are deforestation, seasonal fluctuation in production, lack of modern processing technology and price fluctuations. It was recommended that marketers should be given better access to credit at low interest rate to boost bitter kola marketing business, while agricultural extension model is adopted, the government direct promotion and practice of extension delivery in Nigeria should be reviewed.

Keywords: Producers, marketers, consumers, regression, constraints

Introduction

Garcinia Kola Heckel (Bitter Kola) is an economic and highly valued nut among other tropical trees available in large quantity in West Africa (Ikpesu *et al.*, 2015). The tree is commonly found in humid lowland forest of Nigeria, Cameroon, Ghana and the Benin Republic (Unaeze *et al.*, 2013). Market performance refers to the end results of these policies: the relationship of selling price to costs, size of output, efficiency of production, progressiveness in techniques and products (Bain, 2021). The performance of a firm can be measured through sales revenue, market share, profitability, competitive advantage, customer satisfaction and loyalty. Marketing Performance is marketing's results or output compared against the set objectives. To effectively define success and then beat expectations, marketers must understand that Marketing Performance has two main drivers: Marketing Execution and Marketing Performance Management. Marketing Execution is all market-facing activities; ranging from over-arching global marketing campaigns to individual

field events and digital marketing (Griebel, 2021). Execution is the muscle behind everything the marketing organization does. Marketing Performance Management (MPM) includes the processes, technologies and actions used by marketing organizations to plan marketing activities, evaluate marketing results against established goals, and make more impactful decisions (Vandita, 2019). Agricultural biodiversity provides people with food and raw materials for products; such as clothing cotton, shelter, fuelwood, medicinal plants and roots, and biofuel resources, as well as employment and livelihoods, including those derived from subsistence agriculture (Swain, 2017). The forests, in addition to their important role in protecting the fragile country's environment, provide variety of goods and services, the major forest products are timber, fuelwood, and a number of other non-wood products (Ojedokun 2019). Bitter kola has been used over the years to fight infections from the common cold to hepatitis (Iheke *et al.*, 2017). A 2018 study showed that bitter kola can help combat coughs,

bacterial infections, and viral infections, eating bitter kola when an infection starts may help fight the infection and make you feel better more quickly (Kaimi, 2020). It is found in Benin, Cameroon, Democratic Republic of the Congo, Ivory Coast, Mali, Gabon, Ghana, Liberia, Nigeria, Senegal and Sierra Leone. Its natural habitat is subtropical or tropical moist lowland forests, as indicated by Odebunmi *et al.* (2009), *Garcinia kola* has 722.10mg/100g of potassium (K), 67.07 ± 0.12 mg/kgDM of calcium (Ca), 114.83 ± 3.47 mg/kgDM of magnesium (Mg), 6.10 ± 0.43 mg/kgDM of iron (Fe), 2.30 ± 0.08 mg/kgDM of zinc (Zn), and 188.57 ± 0.37 mg/kgDM of phosphorus (P) (Odebunmi, 2009). The tree produces edible and medicinal seeds which are widely consumed (Okigbo, 1977). The nuts have a bitter taste followed by slight sweetness; hence the name bitter kola. Despite its bitter taste, *Garcinia kola* nuts are commonly eaten as snacks and used for their stimulant effects due to high caffeine content (Ayensu, 1978). The trees are abundant in densely populated areas of natural and secondary forests where the predominant land-use system is tree-crop plantation farming (Ojedokun, 2019). The major places where the commodity is found growing wild are forest reserves and free areas of the rainforests (Aiyelaagbe *et al.*, 1996) or it is either planted or conserved on farms of oil- palm- cocoa- yam plantations (Adebisi, 2004). These two growing regions are found in low-altitude areas with an annual rainfall of 2,000 to 2,500mm, temperatures of 21 – 32°C and a minimum relative humidity of 76% (Ntameg, 1997). Apart from being a stimulant, *Garcinia* nut has a bitter astringent and resinous taste when chewed and is often used as an aphrodisiac (Iheke *et al.*, 2017). It is highly valued for its perceived medicinal attributes and the fact that consumption of large quantity does not cause indigestion (as kola nuts do) make it a highly desired product (Adebisi, 2004). *Garcinia kola* is characterized by a slow rate of growth; difficulties are always encountered in attempting to raise its seedlings because the tree has a naturally long gestation period which can last up to 10-15 years before flowering and fruiting, but Marcots farming method can lead to fruiting after only 4-5 years (Adebisi, 2004). Ofori *et al.* (2007) identified several ethnobotanical uses to which the local people of South-east Nigeria put *Garcinia* seeds. These include the use as antidotes to snake bite, poison or overdose and use as a snake repellent; among the notable clans of Eastern Nigeria, *Garcinia kola* is very important and well recognized plant used for centuries to treat chest cold in traditional medicine (Okojie *et al.*, 2009). Ofusori *et al.* (2008) reported improved respiratory function after 28 days use of cola extract on rats, supporting the folklore use among the Notable clan. Eye-drops containing 0.5% extract of *Garcinia Kola* seeds also reduces eye pressure (Adefule -Ositelu *et al.*, 2008). The market price of this important forest product is escalating annually due to inadequate supply as a result of relying heavily on natural sources, which are supplemented hardly at all by collections from a few stands in farms and home gardens. Many households make and sustain their livelihoods from the collection

and marketing of various non-timber forest products in Sub-Saharan Africa (Ogunwusi, 2012). Seasonal fluctuations, in production, deforestation, pests and disease, lack of adequate resource inputs, inadequate information and the absence of good roads and modern techniques have reduced the motivation of collectors to source bitter kola from the forests. Hence, there are few or no statistics on the economics within which bitter kola marketers operate to guide realistic policy and programme formulation to achieve profitability in the enterprise. Thus, we undertook Market Performance and utilization of bitter kola.

Methodology

The study was carried out in four communities in Abia State, Nigeria. They are geographically situated within latitude 5°N and 7°N and longitude 7°E and 9°E Greenwich meridian (NRCRI, 2019). The study was purposively carried out in four Local Governments of Ikwuano, Umuahia North, Umuahia South and Bende due to the possession of Research based Institutes and a viable market suitable for the crop, with a total population of approximately 692,710 (NPC, 2006).

Sampling Technique

A purposive sampling technique was adopted in the selection of 180 respondents across the four Local Government Areas. The first stage involved selecting one community purposively from each Local Government, the second stage-random selection of three villages from each of the selected communities making a total of twelve villages. From Ikwuano L.G.A, Umudike community was selected, the villages were Umudike, Amaoba and Umugbalo. From Bende L.G.A, Bende Community was selected, the villages were Amaogwu, Agbomiri and Ndiokorieukwu. From Umuahia North L.G.A, Ibeku community was selected, the villages selected were Okwuta, Lodu and Umuaroko, while from Umuahia South L.G.A, Olokoro community was selected, the villages were Umuuala Olokoro, Itu Olokoro and Itaja Olokoro. From each village, 5 farmers having a tree stand of *Garcinia* in his/her farm, 5 marketers and 5 household consumers of *Garcinia* gave data for this study through copies of well designed structured questionnaire, total 180.

Data Analysis

Data collected were analyzed using descriptive statistics, cost and returns analysis and multiple regression analysis. The multiple regression analysis was used to examine the factors influencing the value of sales and is specified implicitly thus;

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7) + e \dots (1)$$

Where;

Y = value of *Garcinia Kola* sold in Naira (N)

X₁ = age of marketers in years

X₂ = educational level of marketers in years

X₃ = marketing experience of marketers in years

X₄ = household size (number)

X₅ = membership of social organization (1= Yes, 0=No)

X₆ = total household income(N)

X_7 = distance to market in km

e = error term

For the cost and returns in the output of *Garcinia kola* marketing, gross margin analytical procedure was employed thus:

$$GM = TR - TVC$$

Where:

GM = Gross Margin

TVC = Total Variable Cost

Marketing margin was arrived at thus:

$$\frac{\text{Selling Price} - \text{Cost Price}}{\text{Selling Price}} \times 100 \dots (2)$$

While marketing efficiency was also estimated thus:

$$\frac{\text{Value added by marketing (net return)}}{\text{Total marketing cost}} \times 100 \dots (3)$$

Results and Discussion

Table 1 show that majority of the bitter kola producers (85.2%) were males and 14.8% females, while for marketers 82.6% and 17.4% were females and males and for consumers 60.7% and 39.3% were females and males. Men dominated the collection of bitter kola in the study area because of the drudgery of bitter kola sourcing. Thus women engaged in mostly marketing the seeds and consumption activities, while men did most of the harvesting and processing as earlier reported by Aiyelaja *et al.* (2012). The high percentage of females has the implication that bitter kola marketing is gender specific. Women did marketing better than men because of their bargaining ability. This observation agreed with Anuebunwa (2007) and Ogunwande *et al.* (2009). The table also shows that the producers (63% and 37%), marketers (56.5% and 43.5%) and consumers (16.1% and 23.1%) were within the age range of 21 – 30yrs and 41 - 50yrs respectively, while 32.1% and 28.6% which represent the consumers fall between the age range of 31 – 40 and above 50years old respectively. The implication of this is that young people engage more in the bitter kola marketing business than the older people in the study area. Marketing is best accomplished by young people because of its furious nature. Nwaru (2004) agreed with this finding who reported that age is necessary in marketing of Agricultural and Forest produce. The result also revealed that the majority of the producers (37% and 63%), marketers (37% and 63%) and consumers (26.8% and 62.5%) were single and married respectively, while just 10% of the consumers were widows. This gives a vivid confirmation that the married in the study area were much involved in bitter kola marketing; and this confirms the findings of Taphone (2009) who reported that married people have more responsibilities in taking care of their family members and this may be the reason why the enterprise is dominated by them to meet those responsibilities. Marriage is a highly cherished value among people in the study area as reported by Ekong (2003). The result further showed that many of producers (44.9%, 37.0%), consumers (26.8%, 39.3%, 19.6%) and little of

marketers (37.0%) were literate while only 18.5% of producers, 63% of marketers and 14.3% of consumers were illiterate in the study area. Education helps for prudent resource management and easy access to information in order to maximize profit. Nwaru (2001), Iheke (2010), are consistent to this finding and (Adebayo and Adeola 2005). The result shows that the majority of the producers (66.7%), marketers (67.4%) and consumers (62.5%) constitute the household size ranging from 1-5 persons, while 22.2% and 11.1%, 13.0% and 19.6%, and 37.8% falls between the range of 6-10 and above 10 persons of the producers, marketers and consumers respectively. The bitter kola collectors had expanded households providing cheap labour during harvesting and processing (Awotide *et al.*, 2011). The harvesting and marketing of non-timber forest product have been noted to support large household in rural areas during scarcity (Schreckenborg *et al.*, 2006, Sani *et al.*, 1999 and Onyioha *et al.*, 2009) is consistent with this findings. The result in the table reveals that many of the producers (48.1%), marketers (63%) and consumers (25%) had years of experience ranging between 1-5 years, while (33.3%, 32.5% and 21.4%), (7.4%, 4.3% and 16.1%) and (11.1%, 0% and 37.5%) of producers, marketers and consumers were between 6-10yrs, 11-15yrs and above 15 years respectively. Long years of involvement in marketing (marketing experience) exposes the marketer to marketing ideas that will help him/her to overcome marketing intricacies in order to achieve high profit. (Okoye *et al.*, 2008).

Table 2 shows the multiple responses of respondents on the various consumption reasons of bitter kola; 60.7% of the respondents have medical reasons, 17.9% - cultural, 8.9% - social, while 12.5% of the respondent have both medical and cultural reasons. Among the various ailments and attributes which the respondent claimed that bitter kola could resolve are cold remedy and snake repellent (42.9%), eye pressure, immunity and food poisoning (3.6%), chronic rheumatism, snake repellent and back pain (7.1%), snake repellent (7.1%), cold remedy (26.8%) and all the above mentioned (12.5%). The mode of usage which the respondent claimed are daily (37.5%), weekly (30.4%), fortnightly (12.5%), and monthly (19.6%). About 66.1% of the respondent asserted that they used it for all their family members, while 33.9% disclaimed the usage. The improvement noticed with the usage of bitter kola is either instant (42.2%) or gradual (51.8%); while the forms of usage are as raw (98.2%) and grounded (1.8%) as claimed by the respondents. Almost all the respondent (92.9%) agreed to recommend bitter kola for usage, while 7.1% disclaimed the recommendation of usage. Among the various cultural and social reasons which the respondents claimed that bitter kola are used for are weddings and hospitality (19.6%), naming and wedding ceremonies (12.5%), traditional health care (19.6%), hospitality and traditional health care (12.5%). All mentioned above except Naming, Oath taking and Traditional health care (7.1%). All aforementioned except Divination and hospitality (54%). All except

Naming and wedding ceremony (3.6%). The major sources of bitter kola according to respondents are Market (96.4%) and Bush (3.6%). The quantity purchased at a time according to the respondents are 1-3kg by 80.4% of respondents, 4-6kg by 16.1% and 7-10kg by 3.6% respondents. The amount spent on bitter kola at a time of purchase varies from N50 –N100 by 51.8% of the respondents, N150 –N200 by 35.7%, N300 –N400 by 7.1% and more than N500 by 5.4% of the respondents. All the respondents claimed that seed is the part of bitter kola commonly used

Cost and Returns of *Garcinia kola* market in the study area

The result for cost and returns of bitter kola Market in the study area is presented in Table 3. The results shows a monthly revenue of about N39,780 for the *Garcinia kola* marketers in the study area, total variable costs estimated as N26,248, and fixed cost as N128.01. The result further shows a Net return of N13,403.99. Variable cost items were about 99.51% of the total cost of marketing in the study area. The result further shows a RCR of 1:1.51. This implies that for every one naira spent about N1.51 was returned to the kola marketer. This is in line with research findings of Njoku (2006), Obasi and Mejaha (2007). The result further shows a marketing efficiency ratio of 0.51. The marketing efficiency is a measure of market performance. It shows the return recorded by the marketers from a unit cost incurred in the business. This marketing ratio of 0.51 implies that the bitter kola marketers returned N0.50 for every N1 input in the marketing business. This result shows that the marketers were efficient in terms of output-input ratio in the business and it corroborates with research of Enete (2013).

Market Margin Analysis

The results in Table 4 shows the market margin analysis for *Garcinia kola* marketers in the study area. The results shows a market margin of 37.06 and a market share of 62.94 for the *Garcinia Kola* marketer (Table 4).

Determinants of sales value

The results for the determinants of sales value is presented in Table 5. The result shows that semi-log functional form was chosen as lead equation among the four functional forms fitted in the model. The lead equation was chosen based on conformity to *a priori* expectations, the value of R² and number of significant variables. The result shows that 5 variables out of the 7 fitted in the model were significant. The variables are age, level of education, marketing experience, household size and distance. The R² value of 0.823 implies that 82.3% of the total variation in value of sales (Y) is explained or accounted for by the independent variables (X), the remaining 17.7% was lost due to error or variables not included in the model. The F value of 14.08 is highly significant at 1% implying that there is goodness of fit in the model. The coefficient of age was statistically significant at 1% and inversely related to the dependent variable (value of sales). This is as expected conforms to *a priori* expectation and

corroborates with Henri-Ukoha et al., (2010). This implies that as age of marketers increases, the dependent variable (Value of sales) decreases. The coefficient of household size and level of education were significant at 5% and positively related to the dependent variable (value of sales). This is also as expected and conforms to *a priori* expectations. This implies that as the number of household and educational level increases, the dependent variable (value of sales) will increase as more of the product will be sold by the household members who assist in the marketing of the product. This corroborates with the research of Amaefula et al. (2010) who also got positive relationship for household size in their study. The coefficient of marketing experience was significant at 1% and directly related to the dependent variable (Value of sales). This is as expected and conforms to *a priori* expectation. This implies that the more experienced the marketers, the higher their value of sales. This is in line with Mkpado and Onuoha (2012), who reported that marketing experience has positive influence on value of sales. The coefficient of distance was statistically significant at 10% and inversely related to value of sales. This implies that the further the distance of market to the marketers, the lower the value of sales. This corroborated with research of Obasi (2014) who also reported negative relation for distance.

Table 6 showed the constraints militating against bitter kola marketing by the respondents in the study area. Deforestation (95.65%), seasonal fluctuation in production (84.78%), lack of modern processing technology (82.61%) and price fluctuation (73.1%) were the most severe constraints to bitter kola marketing in Abia State. The findings corroborate Yusuf et al. (2014) who reported that transportation, irregular supply of product, poor marketing and price fluctuation were major challenges facing the marketers of non-timber forest producer such as bitter kola in Nigeria. Famuyide et al., (2012) indicated that price fluctuation as a major constraint to bitter kola marketing is due to the fact that the forest –fruits are not always available throughout the year due to the seasonal nature and perishability which makes them scarce, leading to unwanted change in prices of the fruits. The least severe constraints to bitter kola marketing in the study area were lack of transport (55.17%) and lack of storage facility (41.30%).

Conclusion

From this study, majority of the respondents were within their productive age although females were more involved in marketing than males in the study area probably because of its time-wasting nature while males were more involved in production of bitter kola. Majority of the respondents were married and had formal education up to secondary school level. Furthermore, from the study it can be concluded that bitter kola marketing in the study area is profitable because most stakeholders were married. Also the study concluded that age, household size, level of education marketing experience and distance are the significant factors determining the bitter kola marketer's revenue.

Most consumption reasons discovered are medical, social and cultural in nature. Finally most of the severe constraints to bitter kola marketing discovered are deforestation, seasonal fluctuation in production, lack of modern processing technology and price fluctuation. Based on the result of this work, the following recommendations were made as it has been observed from this study that majority of producers were males and majority of marketers were females. It is hereby recommended that Adult education should be given to bitter kola marketers to enhance the adoption of new marketing innovation and strategies, and also to the producers for increased knowledge of modern technology. Access to affordable agricultural marketing loans should be enhanced through the provision of minimal and interest free loans. Also our unemployed youths and young school leavers should be encouraged through awareness campaign to venture into bitter kola marketing as a profitable venture in the study area. Private sector and non-governmental organizations should ensure training for the marketers to enhance high productivity in bitter kola marketing. Finally whatever agricultural extension model is adopted, the governments direct promotion and practice of extension delivery in Nigeria should be reviewed.

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Table1: Socio economic Distribution of the respondents

Variable	Producers	%	Marketers	%	Consumers	%
Gender						
Male	23	85.2	8	17.4	22	39.3
Female	4	14.8	38	82.6	34	60.
Total	27	100.0	46	100.0	56	100.0
Age						
21 – 30	17	63.0	26	56.5	9	16.1
31 – 40	-	-	-	-	18	32.1
41 – 50	10	37.0	20	43.5	13	23.1
Above 50	-	-	-	-	16	28.6
Marital Status						
Single	10	37.0	17	37.0	15	26.8
Married	17	63.0	29	63.0	35	62.5
Windows	-	-	-	-	6	10.7
Divorced	-	-	-	-	-	-
Educational Level						
Non-formal education	5	18.5	29	63.0	8	14.3
Primary	12	44.9	17	37.0	15	26.8
Secondary	10	37.0	-	-	22	39.3
Tertiary	-	-	-	-	11	19.6
Household size						
1 – 5	18	66.7	31	67.4	35	62.5
6 – 10	6	22.2	6	13.0	21	37.5
Above 10	3	11.1	9	19.6	-	-
Years of Experience						
1 – 5	13	48.1	29	63.0	14	25.0
6 – 10	9	33.3	15	32.5	12	21.4
11 – 15	2	7.4	2	4.3	9	16.1
>15 yrs	3	11.1	-	-	21	37.5
Religion						
Christianity	27	100.0	45	97.8	56	100.0
Trad. worshippers	-	-	1	2.2	-	-

Source: Field survey, 2019

Table 2: Usefulness of *G. cola* to the Respondents

Consumption reasons	Medically	34	60.7
	Culturally	10	17.9
	Socially	5	8.9
	Medically / culturally	7	12.5
	Total	56	100.0
Ailments / attributes	Cold remedy /snake repellent	24	42.9
	Eye pressure / immunity / food poisoning	2	3.6
	Chronic rheumatism snake repellent and back pain	4	7.1
	Snake repellent	4	7.1
	Cold remedy	15	26.8
Frequency of Consumption	All mentioned	7	12.5
	Daily	21	37.5
	Weekly	17	30.4
	Fortnightly	7	12.5
Used for all family members.	Monthly	11	19.6
	-Yes	37	66.1
	No	19	33.9
Improved noticed	Instant	27	48.2
	Gradual	29	51.8
Usage form	Raw	55	98.2
	Grounded	1	1.8
Recommended	Yes	52	92.9
	No	4	7.1
Cultural / Social reasons for usage	Wedding / Hospitality	11	19.6
	Naming / Wedding ceremony	7	12.5
	Traditional healthcare	11	19.6
	Hospitality / Traditional healthcare	7	12.5
	All except Naming/Oat taking/Traditional Healthcare	4	7.1
	All except Divination / Hospitality	3	5.4
Source of Kola	All except Naming / wedding ceremony	2	3.6
	Market	54	96.4
	Bush	2	3.6
Quantity purchased a time	1 – 3kg	45	80.4
	4 – 6kg	9	16.1
	7 – 10kg	2	3.6
Amount spend on kola / time	₦50 – 100	29	51.8
	150 – 200	20	35.7
	300 – 400	4	7.1
	>500	3	5.4
Parts of kola commonly used	Seed	56	100

Source: Field survey, 2019

Table 3: Cost and Returns Analysis Of G. kola Marketing in the study area (Monthly)

A	>Returns	Mean Value
	Selling Price (per paint)	6800
	Quantity sold (per paint)	5.85
	Total Returns (#)	39780
B	Variable Cost	
	Purchase cost (4280)	25038
	Transportation	520
	Market charge	250
	Nylon	80
	Storage	110
	Feeding	250
	Total Variable Cost	26248
	Contingences (10% Of TVC)	2624.8
C	Fixed Cost	
	Table	52.45
	Paints	45.56
	Basin	30
	Total Fixed Cost	128.01
	Total Cost (FC + VC)	26376.01
D	Net Returns (TR-TC)	
	Total Returns	39780
	Total cost	26376.01
	Net Returns (#)	13,403.99
E	RCR (TR/TC)	1:1.51
F	M.E (NR/TC)	0.501

Source: Field Survey, 2019

Table 4: Market Margin Analysis

	Price	Market Margin	Market share
Selling Price	6800		
Purchase Price	4280	37.06	62.94

Source: Field survey, 2019

Table 5 Regression Analysis for determinants of sales value

Explanatory Variable	Linear	Semi-log(+)	Double-log	Exponential
Constant	25.812 (2.94)**	2.324 (4.56)***	-4.677 (-1.17)	-59.790 (1.09)
Age (X ₁)	-0.537 (-1.656)	-0.0079 (-4.36)***	0.1766 (0.66)	-0.4012 (1.06)
Level of Education (X ₂)	-0.18 (-1.95)*	0.09 (2.51)**	0.01 (2.05)*	0.14 (1.82)*
M.Exp (X ₃)	0.63 (1.42)	0.17 (4.40)***	0.15 (1.99)*	0.07 (1.92)*
Household Size (X ₄)	0.04 (0.56)	0.14 (2.53)**	0.21 (1.44)	0.98 (1.95)*
Membership of Social org(X ₅)	-2.07 (-2.89)**	-0.04 (-0.49)	-0.18 (-1.58)	-0.10 (-1.04)
Total HH income (X ₆)	1.15 (3.10)***	0.16 (1.35)	0.28 (2.89)***	0.08 (1.98)*
Distance(X ₇)	-0.564 (-1.39)	-0.212 (-1.93)*	-0.032 (-1.48)	-0.001 (-0.22)
R ²	0.805	0.823	0.624	0.57
F ratio	3.678***	14.08***	9.099***	6.32***

Source: Field survey data, 2019

Figure in parenthesis are the t-ratio. *, **, *** = Significant at 10%, 5% 1% , respectively

Table 6: Constraints faced by Bitter kola Marketers in the Study Area

Problem encountered	*Frequency	Percentage	Rank
Lack of transport	24	52.17	7 th
Lack of storage facility	19	41.30	8 th
Prince fluctuation	34	73.91	4 th
Middlemen low price	26	56.52	6 th
Season fluctuation in period	39	84.78	2 nd
Deforestation	44	95.65	1 st
Lack of modern Process technology	38	82.61	3 rd
No access to credit facilities	31	67.39	5 th

Source: Field survey, 2019

**Multiple responses*

Note: = Rank 1 is considered the most severe constraint, while rank 8 is the least severe constraint