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Financial Analysis of Bee Honey Marketing in Ikwuano Local Government Area, Abia State Nigeria

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Abstract

The study examined the profitability of bee honey marketing in Ikwuano Local Government Area of Abia State, Nigeria. Purposive sampling technique was used in the selection of 45 bee farmers. The data, collected by means of a well structured questionnaire, was analyzed using descriptive statistics such as mean, percentage and frequency distribution table. Regression analysis was also used to determine the factors that influenced profitability of the bee honey marketing in the study area. The result showed that the business is male dominated. Net return analysis showed that honey bee production in the study area was profitable posting gross margin and net income of N131,033.28 and N125,512.12 respectively. The multiple regression analysis using linear functional form as the lead equation showed that the entire significant variables (variable cost, quantity of honey and price of production) had positive influence on the profitability of commercial honeybee production in the study area. The research highlighted some of the major problems which include pest attack, inefficient processing and storage system, small scale production and inadequate capital. It is recommended that government should encourage bee farming through the provision of incentives such as credits to enable the farmer expand production and serves as poverty alleviation outfit. Extension service agents can be used to create awareness and educate women on the benefit of engaging in bee honey business. Bee farmers can form cooperative society. The benefit of this is large scale production which will introduce wholesalers and retailers back in the system. It will also broaden farmers' capital based for business expansion.

Keywords

Profitable, Marketing Share, Credit Incentive, Processing, Large scale Production

1. Introduction

BEE honey can be described as the sticky and sweet like substance obtained from the social and colonial insect called honey bees (Apismellifera) [1]. Honey bees are a subset of bees which fall into the order of exploring Hymenoroptera and the sub-order Aprocrita. The science and practice of exploiting honey bees products and services known as 'APPICULTURE', has been in existence for thousands of years [2]. Men have been harvesting bee honey from the wild nest for several years and it was discovered that bee honey can be obtained in a more convenient and easier way, if bees are encouraged to nest in hives. This led to the origin of beekeeping and management in hives. It is widely practiced in Nigeria and other countries of the world as result of extensive and magnificent important of honey in the areas of food and medicine [3]. As reported by Fabunmi) [4], the relevance of honey bee to both the local, national and global economics is over emphasized. Honey bee contributes $15bn to the value of United States annually.

The use of bees in biological (non-pesticide) control of agricultural pest is also an industry generating $20M in the United State, per year. About $20M worth of honey is produced in the US annually, while over $30M is made by American beekeepers from renting out bees for crop pollination. The market for honey beverages in the US is worth about $195M per year aside from the processing and packaging of bee honey by products, such as pollen, propolis and royal jelly as food supplement which generate more than $1bn annually. Moreover the beneficiaries of the bee wealth in the US are not limited only beekeepers and crop farmers.

Many non-beekeepers also generates income from other bee based business like, honey packaging, production of honey based cosmetics, candle-making, medicinal practice predicted on bees and honey, honey (bee therapy) bee food service industry such as baking with honey, honey sports beverage and honey wine production.

Beekeeping is also a veritable means of creating jobs particularly for the unemployed youths and poor rural population. Ojeleye [3] reported that some industries such as food, pharmaceutical and cosmetics as well as brewery industries depend on bee honey as a source or part of the raw materials needed in production of their commodity. For example drugs, body creams, lip balm, confectionaries etc. Bee honey is a sweetener in food and an alternative to sugar whose consumption can be detrimental to human health. It can be used as food supplement since it contains some of the nutrients needed for body metabolism, thus combating malnutrition. Bee honey is useful in the treatment of various ailments such as cough, constipation, diabetes, sore burns, indigestion, and arthritis. It is also used as an elixir to relieve sore throat [2]. The inherent problem of bee honey marketing could be traced to poor transportation and logistics, inefficient processing, packaging and handling of honey bee [5]. It is therefore very necessary to undertake a financial analysis of bee honey marketing. The specific objectives of the study are to:

i. describe socio-economic characteristics of bee honey marketing in the study area;
ii. determine the costs and returns associated with the marketing of bee honey in the study area
iii. describe the marketing channel of bee honey in the study area.
iv. determine the marketing margin, marketing efficiency and marketing share of bee honey marketers in the study area.
v. determine factors affecting profitability of bee honey marketing in the study area and
vi. identify the constraints facing honey bee marketers in the study area.

2. Material and Methods

Purposive sampling technique was used which led to the selection of 45 bee honey marketers due to the limited number of bee keepers in the study area. Objectives (i), (iii), (v) & (vi) was analysed using descriptive statistics such as mean, percentage and frequency distribution table. In objective (ii) net return analysis was used to determine the profitability of commercial bee honey marketing in the study area; while objective (iv) was analysed using regression analysis.

Model specification

$$GM = \sum P, Q, - \sum PX,\ xi \text{----------(i)}$$

Where
GM =Gross margin
Pi Unit Price of output
Pxi unit price of Input
Qi = quantity of each output
Xi = Input variable
$\sum$ = summation sign

$$GM = TR - TVC \text{----------(ii)}$$

The implicit model is as follow

$Y = F(X_1, X_2, X_3, X_4, X_5, X_6, X_7 \text{----------} ei)$

Where
Y = Gross Margin
X_1 Age
X_2 Marital Status
X_3 = Educational Level
X_4 = House hold Size
X_5 = Working Experience
X_6 =Variable Cost
X_7 = Credit Access
X_8 = Quality of money
X_9 = Price of Product
X_{10} =Scale of Production
X_{11} = Location
X_{12} Level of technology
X_{13} = Farm Income
X_{14} = Depreciation cost
ei =error term

Four functional forms (linear, exponential, semi log, and double log) were used. The best fitted in terms of R^2, magnitude of the F-ration, number of significant parameters, and conformity to *apriori* expectation, was chosen

3. Result and Discussion

3.1. Socio Economic Characteristics of Respondence

Table 1 presents the distribution of respondents according to age. It is evident from the table that majority (42.5%) of the respondents were 41 and 50 years, 40.0%,12.5% and5.0 others were between ages of 31and 40, 21 and 30 and 51 and above years respectively. This indicated that most of the bee farmers in the study area were in their productive age. The age of a farmer affects his/her ability to adopt new innovation and production techniques in agriculture as well as his working capacity.

Table 1. *Distribution of the respondents according to age.*

AGE	FREQUENCY	PERCENTAGE (%)
21-30	5	12.5
31-40	16	40.0
41-50	17	42.5
51-60	2	5.0
TOTAL	40	100

Source: field Survey Data, 2012.

Table 2 presents the distribution of respondents according to sex. The analysis showed that most (64.4%) of the honey bee farmers were male while the remaining (35.6%) of the respondents were females. It can therefore be concluded that

honey bee production in the study area was dominated by male. This may be due to the fact that females play supportive roles like cooking and other domestic activities in the family. This result is contrary to Onyebinama [6] who noted that although more males were involved in honey bee production, the gender difference were not significant.

Table 2. *Distribution of respondents according to sex.*

SEX	FREQUENCY	PERCENTAGE
MALE	29	64.4
FEMALE	16	35.6
TOTAL	45	100

Source: field Survey Data, 2012.

The distribution according to marital status is shown in Table 3. The marital status analysis of the respondents shows that 55.0 of them are married while 37.5 and 7.5 of the respondent are single and widowed respectively. The result implies that majority of the farm house holds are stable. According to Nwaru [7], this stability should create conducive environments for good citizenship training; development of personal integrity and entrepreneurship which are very important for efficient use of resources.

Table 3. *Distribution Of Respondents According To Marital Status.*

MARITAL STATUS	FREQUENCY	PERCENTAGE
SINGLE	15	37.5
MARRIED	22	55.0
WIDOWED	3	7.5
TOTAL	40	100

Source: field Survey Data, 2012.

Table 4 presents the distribution of respondents according to educational level. The result showed that a good proportion (62.5%) of the respondents had secondary education, 20.0% of them possessed primary education while the tertiary institution education constituted 17.5%. Education is very important among the farmers; because it enables them adopt improved agricultural practices and innovation for improved productivity. This finding conforms to that of Okolo [8].

Table 4. *Distribution of respondent according to educational level.*

LEVEL OF EDUCATION	FREQUENCY	PERCENTAGE
PRIMARY	8	20.0
SECONDARY	25	62.5
TERTIARY	7	17.5
TOTAL	40	100

Source: field Survey Data, 2012.

The distribution of respondents according to family size is presented in Table 5. The family size analysis of the respondents showed that about 50% of the respondents had between 6-10 persons in their family while 40.0%, 7.5% and 2.5 had between 1-5 persons. 10-15 persons and <15 respectively. The corollary is that there is likelihood for respondent to assess their farm lands from their family. The higher the family size, the more the availability of potential labour [8].

Table 5. *Distribution of respondents according to house hold size.*

HOUSEHOLD SIZE	FREQUENCY	PERCENTAGE
1-5	16	40.0
6-10	20	50.0
10-15	3	7.5
ABOVE 5	1	2.5
TOTAL	40	100

Source: field Survey Data, 2012.

Table 6 presents the distribution of respondents, according to years of farming experience. Farming experience analysis of respondents showed that majority (27.5%) of the respondents had between 8-10 years of marketing experience while 25.0%, 12.5% and 10.0% had between 5-7, 2-4, and 11-13and 14-16 years of marketing experience respectively. The number of years a farmer spent in honey bee production could be an indication of the practical experience acquired over the years. Therefore the implication of this finding is that most honey bee farmers in the study area were experienced in the business [8].

Table 6. *Distribution of respondent according to working experience.*

WORKING EXPERINCE (YEARS)	FREQUENCY	PERCENTAGE
2-4	10	25.0
5-7	10	25.0
8-10	11	7.5
11-13	5	12.5
14-16	4	10.0
TOTAL	40	100

Source: field Survey Data, 2012.

3.2. Profitability of Commercial Honey Bee Production in the Study Area

The cost and returns associated with commercial honey bee production in Ikwuano local government area of Abia state Nigeria is shown in Table 7. The cost components were divided into variable and fixed cost. The variable cost components include the wages for capital labour, baiting materials, smoker fuel, bottles for packaging, to mention but a few. Fixed cost components include depreciation cost of hives and other equipment.

The total revenue per farmer per season was pooled at N408,616.67 with gross margin N131,033.28. The revenue was obtained from sales of bee honey and bee wax. Hence, based on the net return profile in Table 7, it can be seen that the net income per farm per season is N125,512.12. Thus, this research showed that honey bee production in Ikwuano Local Government area of Abia State, Nigeria, was profitable. The profit level is plausible hence bee keeping can be used as a poverty alleviation measure especially for the unemployed youths. This result is consistent with Duruson [9] who obtained a similar net income value on the honey bee farmers in Ikwuano LGA of Abia State. The result also conforms to Igbokwe and Mbanaso [10] who obtained a net profit of N13, 546.41 per farm per season solely from honey production in Abia State. Higher profit is possible when other

bees produce are equally harnessed for sales.

Table 7. *Net returns analysis of bee honey production per farm per season in ikwuano local government area of abia state, nigeria.*

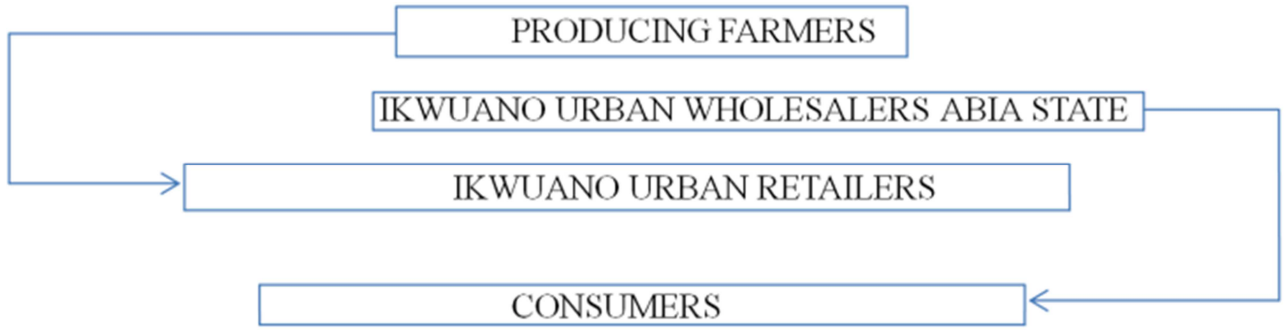
ITEM	UNIT	UNIT COST (N)	QUALITY VALUE (N)
(A)Total value from bottle honey sales	907.55	295	267,727.25
Total value of bee wax kg sales	1118.17	1.26	140,889.42
Total Revenue			
Total variable cost			
(TVC) Labour/Man-day	2296.08	51	117,100.00
Baiting materials	501.45	69	34,600.00
Smoke fuel	79.55	22	1,750.00
Bottles	17.32	6913	119,712.00
Gallons	275	16	4,400.00
(B)Total Variable cost (TVC)	3169.4	7071	277,562.00
Total mean variable cost 70.43	157.13	6,168.04	
(C)Gross Margin (A-B)	131,033.28		
(D)Fixed cost depreciation of Fixed assets	5,521.16		
Such as hives and other equipment's			
Total fixed cost (TFC)	67,430.00		
(E) Total main Fixed cost	1498.44		
(F) NET ICOME (C-D)	125,512.12		

Source: field Survey Data, 2012.

Ogubunka [11] affirms that beekeeping is very profitable in the tropics due to excellent fauna and flora. The return per naira invested by the respondents was greater than zero indicating that for every N1.00 invested in bee honey production, N11.0 was generated. Also, the rate of returns on equity was 0.009%, indicating that for every naira invested into honey bee production, there was 0.009% returns on equity. The implication is that there is a relatively high return hence the payback period on borrowed funds is expected to be short. The result is in harmony with Igbokwe and Mbanaso [10] that obtained N1.80 on return per naira invested in honey bee production with 8% returns on equity above the investment and expenses incurred. This finding is in conformity to that of Olukosi and Erhabor [12].

3.3. The Marketing Channel of Honey Bee

The marketing channels for honey bee marketing in Ikwuano Local Government Area of Abia State are presented in Figure 1.0. It shows that major participants in the distribution channel were the producers and honey bee traders (wholesalers and retailers). Honey bee has simple and similar channels and distribution. These commodities were assembled from the producing areas to retailers in Ikwuano Local Government of Abia State, Nigeria. The major source of honey bee production is the National Root Crop Research Institute which serves as the primary main source. The retailers finally sales the commodity to the end users (consumers). The arrows represent alternative routes of the bee honey marketing channels. This entails a skip of the normal route where a retailer bypass the wholesalers and buy directly form the producers and also consumers buy directly from the wholesalers skipping the retailers. The essence of this skipping is to purchase goods in fresh conditions and at a highly reduced price.



Source: field Survey Data, 2012.

Figure 1. *Schematic representation of honey bee marketing channels in Ikwuano Local Government Area of Abia State.*

3.4. Estimate of Marketing Margin, Marketing Efficiency and Marketing Share

Table 8 shows the marketing margin, marketing efficiency and market share of the producers, wholesalers and retailers of the honey bee marketers in Ikwuano Local Government area of Abia State. Marketing price of the producers, wholesalers and retailers of honey bee for one bottle were shown to be N570, N720, and N980 respectively, while their marketing margins were N570, N150 and N260 respectively. The result further shows that the percentage shares of the producers/farmers, wholesalers and retailers were 58.16%, 15.30% and 26.53% respectively.

The producers' marketing margin and share of the market were considered to be the highest when compared to both the wholesalers and retailers. The reason could be attributed to the farmer's access to the market information and improved transportation. The implication is that wholesaler's tendency to exercise how economic power on price on the expense of the producer's price appeared to have been checked. More so, producers benefited more from the marketing of honey bee because of various roots available to marketing their produce. The implication of this result is that consumers may have lost

confidence with wholesalers and retailers because of incident of adulteration. They therefore prefer to go directly to the farmers. This calls for an intense policy and sincerity by government and stakeholders to enforce compliance of the consumer protection programs. Eliminating wholesalers and retailers in the market system is not healthy because of the incident of unemployment.

Table 8. *Marketing margins, marketing efficiency and market share of the producers, wholesalers and retailers of honey bee marketers in ikwuano local government area of abia state.*

PRODUCERS	WHOLESALERS	RETAILERS	
Measurements	Bottle	Bottle	Bottle
Marketing Price	570	720	98
Marketing Margin	570	150	260
% Market Share	58.16	15.30	26.53

Source: field Survey Data, 2012.

3.5. Estimate of Factors That Affects the Profit of Commercial Bee Honey Production

The result of the multiple regression analysis models on the factors that influence the profitability of bee honey producers in Ikwuano Local Government area of Abia State Nigeria is shown in Table 9. The result shows that all the functional forms where statistically significant at 0.001% probability level implying that any of the functional forms is adequate in estimating and explaining the variations in the profitability equation of bee honey production in the study area. However, the profitability equation was best estimated and explained using the linear functional form which explained 92.3% of the total variation at 0.001% risk level. The form was also chosen based on other considerations such as greater number of significant variables and *apriori* expectation.

Table 9. *Estimate of factors that affects the profit of commercial bee honey production in ikwuano local government area of abia state, nigeria.*

FUNCTUONAL FORMS				
INDEPENDENT VARIABLE.	LINEAR	EXPONETIAL	DOUBLE LOG	SEMI LOG
Constant	-75155.514xxx	9.961xxx	0.260	-1154296.1xxx
	(-3.381)	(30.200)	(0.109)	(-4.377)
Location (X_{11})	-447.226	0.012	0.069	-14752.070
(-0.490)	(0.377)	(0.373)	(-0.723)	
Variable Cost (X_6)	-5.261xxx	-8.603E-5xxx	0.080	-1167.185
	(-7.327)	(8.075)	(-0.726)	(-0.096)
Scale Of Production	-3718.756	-0.088x	-0.233	-1526.477
(X_{10})	(-1.064)	(-1.703)	(-0.7510)	(-0.444)
Educational Level	138.464	-0.014	0.025	1096.034
(X_3)	(0.191)	(-1.270)	(0.102)	(0.040)
Price of Bottled	75.489xxx	0.000	0.838xx	123679.396xxx
Honey (X_9)	(4.833)	(1.323)	(2.812)	(3.744)
Quality of Honey	1102.844xxx	0.017xxx	1.291	95457.077xxx
(X_8)	(5.035)	(5.108)	(4.653)	(3.105)
Credit Access (X_7)	-5480.396	-0.122	-0.161	-17975.296
	(0.870)	(-1.302)	(-0.650)	(-0.654)
House Hold Choice	1247.974	-0.022	-0.024	16692.227
(X_4)	(0.895)	(-0.872)	(-0.199)	(1.232)
R square (R^2)	0.923	0.872	0.910	0.854
Adjusted R^2	0.906	0.844	0.876	0.798
F-ratio	53.818xxx	30.656xxx	26.678xxx	15.361xxx

The coefficient of variable cost (-5.261) was negative and statistically significant at 10.0% alpha level. The sign is in accordance with the *apriori* expectation. This implies that the higher the price of the variable cost the lower the use of inputs in other to maximize profit. This result supports the findings of Nwaru and Ekumankamma [13] that as the input price increases, reduced inputs are used. The coefficient of the price of bottled honey (75.489) was positive and statistically significant at 1.0% alpha level. This suggests that the profit arising from the sales of the bottled honey would increase as the price of the product increases. These results are in consonants with Kadurumba [14] who obtained similar results in his study of economics efficiency of processed palm oil in Imo State Nigeria. The coefficient of quality of honey (1102.44) was positive and statistically significant at 1.0% profitability level. High quality commands higher prices, hence higher profit. This result is consistent with the findings of Umberger *et al* [15] that quality is an important factor for the consumer's preference and willingness to consume any food item.

Table 10. *Problems of honey bee marketers in ikwuano local government area of abia state.*

PROBLEMS IDENTIFIED	FREQUENCY	PERCENTAGE
Pest Attack	12	30
Scale of Production	7	17.5
Cost Of Production	3	7.5
Price Fluctuation	2	5.0
Inadequate Capital	5	12.5
Inadequate Storage Facilities	11	27.5
Total	40	100

Source: field Survey Data, 2012.

3.6. Problems of Honey Bee Marketers

Table 10 show the distribution of honey bee marketers according to problem constraining bee honey marketers in Ikwuano Local Government area. The Table shows that the major problem facing honey business was the attack from pest. The attack of pest led other by 30%. This was followed by inadequate storage facilities (27.5%). The rest are scale of production (17.5%); inadequate capital (12.5%); cost of production (7.5%) and price fluctuation (5.0%).

4. Conclusion

The result of the study shows that the bee honey marketing is profitable to producers who benefited more from the marketing of honey bee than wholesalers and retailers. The implication of this result is that consumers may have lost confidence with wholesalers and retailers because of incident of adulteration. They therefore prefer to go directly to the farmers. However, eliminating wholesalers and retailers in the market system is not healthy because of the incident of unemployment.

Pest attacks, poor storage, processing facilities and inadequate finance were identified as the major constraint militating against bee honey marketing in the study area. Multiple regression analysis showed that production cost (variable cost), quality of honey and price of product had positive influence on the profitability of commercial honey in the study area. This implies that as they increase, the profit accruing to the honey bee farmers would also increase. The result of the analysis also showed that the business of bee honey was dominated by male. This is also not healthy as women constitute a good number of farming population in Nigeria. The following recommendation is therefore necessary to address the problem.

Recommendations

1. Since the enterprise was found to be profitable, government should encourage bee farming through the provision of incentives such as credits to enable the farmer expand production and serves as poverty alleviation outfit.
2. Based on the population of beekeeper in Ikwuano Local Government it is possible that much has not been known about commercial honey bee production. This may also be the reason why consumers go to producers directly in addition to being dominated by men. Extension service agents can be used to create awareness and educate women on the benefit of engaging in bee honey business.
3. Bee farmers can form cooperative society. The benefit of this is large scale production which will introduce wholesalers and retailers back in the system. It will also broaden farmers' capital based for business expansion.
4. Finally, policy should be made particularly as it regards improving the educational status of the farming institution. Non-formal adult education program may be instituted. This is necessary because improved level of education is panacea to improving level of production and productivity which may add to increase income of the farmers.

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