



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

**An Appraisal of Beekeeping Activities among Beneficiaries and Non-Beneficiaries of  
Ekiti State Agricultural Credit Agency (ESACA) Scheme in Nigeria**

By

**<sup>1</sup>Fakayode, S. B, Babatunde, R.O, Olowogbon, S.T, and Adesuyi W. S**

Department of Agricultural Economics and Farm Management, P.M.B 1515,  
University of Ilorin. Ilorin. Nigeria

<sup>1</sup>Corresponding Author: mobile gsm no +2348060236283 e-mails:  
[segun\\_fakayode@yahoo.com](mailto:segun_fakayode@yahoo.com), [wemimoshadrach@yahoo.com](mailto:wemimoshadrach@yahoo.com)

***Contributed Paper presented at the Joint 3<sup>rd</sup> African Association of Agricultural  
Economists (AAAE) and 48<sup>th</sup> Agricultural Economists Association of South Africa  
(AEASA) Conference, Cape Town, South Africa, September 19-23, 2010***

## ABSTRACT

*The study examined beekeeping activities in Ekiti State, Nigeria. Specifically the study appraised the costs and returns structure of beekeeping activities by beneficiaries of the ESACA scheme, examined the constraints to beekeeping under the scheme and outside the scheme and identified factors that affect beekeeping under the scheme and outside the scheme. A total of 150 beekeeper households were selected; 75 households each for ESACA beneficiary and non-beneficiary respondents across communities popularly known for beekeeping in Ekiti state. Descriptive statistics, costs and returns, regression and Kruscal-wallis analyses were employed for data analysis. Beekeeping was found to be more profitable under the ESACA scheme than outside the scheme with returns to beekeeping labour and management of ₦128.5 and ₦87.0 per hive for beneficiary and non-beneficiary respondents respectively. The pooled regression result showed that the ESACA scheme enabled beneficiary respondents to be more economically viable than the non-beneficiary respondents. The bee-keepers are also faced with numerous constraints including inadequate credit, pests and diseases, bee aggressiveness, bush burning, absconding of bees, theft, inadequate technical assistance and poor market problems. The study therefore calls for that ESACA authority should extend its credit facilities to more beekeepers, need to increase loan sums and other credit facilities disbursed to beekeepers and the discouragement of bush burning by the hunters and other forest users during the dry season.*

**Key words:** Kruscal-wallis, costs and returns structure, regression, technical assistance

## Introduction

In Nigeria agriculture is one of the tile important sectors of notable economic relevance in her economic development and growth. This sector provides about 80 percent of food for her increasing population, employs 75 percent of the acute labour force, accounts for over 60 percent of the non-oil foreign earnings as well as providing raw materials for the nation's based industries (Ajekigbe 2007). Agriculture also contributes about 40 percent to the nation's Gross Domestic Product (GDP) (Central Bank of Nigeria, 2008). However, since the discovery of petroleum, the agricultural sector has suffered much neglect. Ayorinde (2005) lamented that 'With the oil boom came the food doom'. He explained further that Nigeria gradually became an importer of food of all sorts and this has worsened the standard of living of Nigerians especially those in urban areas. Agriculture therefore became faced with lots of

problems. These include: inadequate credit facilities and subsidy, small scale production due to land tenure system, poor researches and extension services amongst others.

Over the year, successive Nigerian governments therefore undertook several programmes to improve agricultural production in the country. These programmes include namely the River Basin Development Authority Programme (RBDA) in 1970, Operation Feed the Nation (OFN) in 1976, Structural Adjustment Programme (SAP) in 1985 and the National Economic Empowerment Development Strategy (NEEDS) in 2003 amongst others. Despite all these efforts, the problems facing agricultural production still persist. Difficulties with these programmes are not only with their large numbers and poor management, but they lacked sharp focus as well as technical personnel. These programmes hardly reached the target beneficiaries, quickly loose tempo resulting in uncountable number of abandoned projects (Adekunle, 2007).

In addition, the State and Local Government initiatives at addressing problems of agriculture were also established. These initiatives were aimed at improving agricultural production at the State and Local Government Area levels. They include; the State Economic and Empowerment Development Strategy (SEEDS), Local Government Economic and Empowerment Development Strategy (LEEDS), State Agricultural Development Programmes (ADPs), State Agricultural Inputs Supply Agency (AISAs) amongst others.

This study therefore sought to examine bee keeping facilities and activities under the Ekiti State Agricultural Credit Agency (ESACA) lending scheme. The study sought to provide ways by which mistakes of government initiatives could be remedied.

Over the years, emphases have been more towards the promotion of various types of small-scale income generating activities such as beekeeping. Not until recently, modern beekeeping was almost non-existent in Nigeria. The country's crude honey produced each year came mostly from bee hunters and a few traditional beekeeper.

In Ekiti State however, most honey bees are reared in local hives, wooden reeds and tree trunks. Harvesting is carried out with crude technologies. This has limited the quantity and quality of honey produced in the State (Oluwatusin, 2006). With this state of beekeeping in Ekiti State, the facilities for beekeeping under the ESACA scheme are aimed at improving the quality and quantity of honey produced. The beekeeping facilities under the scheme include: Credit facilities and affordable rate of interest, subsidy on honey extraction machine and the provision of modern bee hives for commercial beekeeping.

The foregoing therefore raises the following research questions:

- What is the nature of beekeeping practices of the ESACA scheme?
- What benefits accrue to the beneficiaries of the ESACA scheme?
- What are the constraints to beekeeping under the ESACA scheme?

This study sought to provide answers to these pertinent questions

### **Objectives of the Study**

The main objective of the study was to examine beekeeping activities under the ESACA scheme. The specific objectives were to:

- Examine the socio-economic characteristics of beekeeper beneficiaries and non-beneficiaries of the ESACA scheme.

- Determine and examine the costs and returns structure of beekeeping under the ESACA scheme and outside the scheme.
- Examine the constraint to beekeeping under the scheme and outside the scheme.
- Examine the factors that affect beekeeping under the scheme and outside the scheme.

### **The Ekiti State Agricultural Credit Agency's Lending Scheme**

The ESACA was established to eradicate poverty and create wealth as means of enhancing economic welfare of individuals, families, communities and the citizens of Ekiti State at large. The agency was established in May, 1999 to provide food for the rapidly increasing population, create employment opportunities, enhance people's economic status, provide growing markets for manufactured goods and provide exports and foreign exchange earnings (ESACA, 1999). Under the scheme, credit facilities are made available for both agricultural and non-agricultural purposes as follows:

- Foods crops (arable crops) farming such as those for maize, rice, yam, cassava and vegetables.
- Tree crops (perennial crops) maintenance, including cocoa, improved oil palm, cashew and citrus farms.
- Livestock production/farming including poultry, cattle, piggery, rabbitary, goat, sheep and other small-live-stock farming.
- Fishery
- Bee-keeping
- Snail farming
- Dry season farming
- Agro-based industries.

- Marketing of non-farm produce like kerosene, clothes, essential commodities and household utensils.
- Artisanship
- Skill acquisition activities as well as:
- Small-scale entrepreneurship

All indigenes and non-indigenes residing and working in the Ekiti State are qualified to apply for the ESACA loans. Target groups under the scheme include individual farmers, registered co-operatives or groups of livestock producers, bee keeper's associations, farm settlers, irrigation/fadama farmers, civil servants, companies and education institutions. The scheme's beneficiaries are usually granted a period of moratorium; usually three months in the case of non-agricultural loans, after which loan repayment is expected to be completed within twelve months. For agricultural loans, the period of moratorium ranges from three to twelve months depending on the gestation period of the enterprise concerned after which loan repayment must be completed within three to six months. A nominal interest of 10 percent per month is payable after the moratorium and the appropriate accounts into which repayments must be paid are notified.

There are conditions that govern prospective beneficiaries' eligibility to obtain ESACA loans. First, a prospective beneficiary must purchase an application form at a prescribed fee of ₦500.00 only. He must be able to provide two guarantors and be ready to furnish a proportion of the total cost of his proposed project for which loan is requested. He must also be ready to follow improved production practices and advice as furnished to him by ESACA authorities. In the case of agricultural loans for the purchase of machines chemicals, fertilizers, improved planting materials and livestock production, the agency makes direct payment to the agreed

suppliers. In return, the supplier furnishes the agency copies of delivery note made to the borrower. For poultry and other livestock endeavours, applicant must have a minimum of two years experience of his or her proposed enterprise to qualify for loan. Table 1 shows the time or period of the year for which loan can be requested vis-à-vis the moratorium.

Table 1: ESACA Period of Loan Request and Moratorium

<b>Enterprises</b>	<b>Period of the Year</b>	<b>Moratorium in months</b>
Cassava farming	February – June	6 – 12
Maize/Rice farming	January – June	3 – 5
Yam farming	July – September	6 – 9
Marketing	Anytime of the year	3
Perennial crops maintenance	Anytime of the year	3 – 8
Livestock production	Anytime of the year	3 – 6
Fishery	Anytime of the year	3 – 6
Beekeeping	Anytime of the year	3 – 6
Snail farming	Anytime of the year	3 – 6
Rabbit farming	Anytime of the year	3 – 6
Irrigation/Fadama farming	September – November	3

Source: ESACA, 1999

There are three types of loan facilities under the ESACA scheme; the short term loan which is payable within one year; medium-term loan which is payable within two to four years and long-term loan which is payable from five years and above. In addition, the loan volume ranges from small-scale loan, medium-scale loan and large scale loan. The small-scale loan is between ₦10,000 to ₦ 30,000; the medium-scale loan ranges between ₦31,000 to ₦100,000 while large-scale loan is above ₦100,000. Table 2 presents the total disbursement of ESACA loan as at May, 2008.



Table 2: ESACA Loan Disbursement to Farmers in Ekiti State as at May, 2008

Local Government Areas	Number of Beneficiaries	Amount in Naira Million
Ado	2,406	99.6
Ekiti East	1,182	39.6
Ekiti South West	1,138	28.6
Efon	712	27.3
Emure	573	17.0
Ekiti West	868	26.5
Gbonyin	911	22.8
Ido/Osi	1,404	44.1
Irepodun/Ifelodun	1,184	37.3
Ijero	1,512	39.3
Ikere	1,280	46.9
Ikole	1,866	56.5
Ilejemeje	427	11.9
Ise/Orun	1,081	32.7
Moba	719	13.9
Oye	1,172	52.3
Beekeeper's Association	25	2.6
<b>Total</b>	<b>18,460</b>	<b>599.4</b>

140 naira equals 1 US Dollar

Source: Nation Newspaper, 2008

Over the years, emphases have been laid on the promotion of various types of small-scale income generating activities such as beekeeping.

## Methodology

### Study Area and Data

The study was carried out in Ekiti State ( $7^{\circ}15^1$  -  $8^{\circ}5^1$  N;  $4^{\circ}45^1$  E), Nigeria. Ekiti state has a population of 2,737,186 (NPC, 2007). The State consists of 16 Local Government Areas and covers a total land area of 23,212.64 square kilometres. It is dominated by derived savannah

vegetation in the north and forest savannah in the south. Agriculture in the state is rain-fed while mixed cropping is widely practiced. The state is categorised into two Zones, A and B, based on agronomic and ecological considerations (Fakayode, *et al*, 2008). Average annual rainfall in the area ranges between 1,200mm and 1800mm, almost evenly distributed throughout the wet season while temperatures range between 21 and 28°C. Major crops grown in the state include oil palm, cocoa, coffee, yam, cassava, maize, vegetables and fruits (Fakayode *et al*, 2008).

For the study, a total of 150 beekeeper households were selected; 75 households each for beneficiary and non-beneficiary respondents. For the non-beneficiary respondents, a two stage sampling techniques was employed. The first stage involved the selection of 11 communities popularly known for beekeeping in Ekiti state. This was followed by the selection of 75 beekeeper non-beneficiary households across these communities. For the beneficiary respondents, the sampling procedure involved the random selection of 75 beekeepers from the ESACA beekeeper loan beneficiary frame/list. The sample design outlay for selection is as presented in Table 3.

Table 3: Sampling Design Outlay for Selecting the Study's Respondents

<b>Communities</b>	<b>No. of Beneficiaries</b>	<b>No. of Non-Beneficiaries</b>
Ado	6	8
Aromoko	8	8
Aiyetoro	8	8
Ikere	10	8
Ipere	8	8
Aisegba	5	5
Ijan	6	6
Ikole	5	5
Iyin	7	7

Ilawe	6	6
Eporo	6	6
<b>Total</b>	<b>75</b>	<b>75</b>

Source: Field Survey, 2009

### Analytical tools

For the study, the farm budget, regression and the Kruskal-wallis One-way Analysis of Variance (ANOVA) analyses was used. The farm budget analysis was used to determine the structure of costs and returns to beekeeping. The equations are outlined thus:

$$GM = \sum_{i=1}^n GR - TVC \dots\dots\dots (1)$$

$$RLM = GM - \sum_{i=1}^n (r + R_i + D + L_u) \dots\dots\dots (2)$$

Where GM=Gross Margin, GR=Gross Revenue, TVC=Total Variable Cost, RLM=Returns to Labour and Management, r=Imputed interest on Credit,  $R_i$ =Imputed rents on forest reserve/land, D=Depreciation on tools and equipments,  $L_u$ =Imputed Costs of Non-paid labour.

### Regression Analysis

The OLS regression/production function analysis was employed to examine the influence of the ESACA scheme beekeeping in the study area, as well as to know whether the non-beneficiary respondents were really worse-off than their beekeeper beneficiary counterparts.

The implicit form of the equation is given as follows:

$$Y = f(X_1, X_2, X_3, X_4, D, \mu) \dots\dots\dots (3)$$

Where Y=Output of honey in kg,  $X_1$ =Production Expenses in naira (₦),  $X_2$ =Household size of respondents,  $X_3$ =Years of involvement in beekeeping,  $X_4$ =Number of hives used

D=ESACA membership dummied as 1 for members and 0 for non-members and  $\mu$ =Error Term

### Kruskal-Wallis One-way Analysis of Variance (ANOVA) by Ranks

To examine constraints to beekeeping under and outside the ESACA scheme, the Kruskal-Wallis One-way Analysis of Variance (ANOVA) by Ranks was used. This involved assigning of priorities to identified constraint. The identified constraints are: inadequate equipment, credit/capital, pests and disease, theft, bee aggressiveness, absconding of bees, inadequate marketing facilities and bush burning.

The equation for extracting the rank is outlined as 4:

$$H = \frac{12}{N+1} \sum \frac{1}{n_i} [R_i - n_i \frac{(N+1)}{2}]^2 \dots \dots \dots (4)$$

Where  $R_i$  is the sum of the ranks assigned to observations in the  $i$ th sample and

$n_i \frac{(N+1)}{2}$  is the expected sum of ranks for the  $i$ th treatment (Wayne,1990).

## Results and Discussion

### Socio-economic Characteristics of Respondents

The socio-economic characteristics of the respondent are expected to play important roles in the economic performance of beekeepers activities. This is as presented in Table 4.

Table 4: Socio-economic Characteristics of Respondents

Nature of Credit	Beneficiaries		Non-beneficiaries	
	Frequency	Percentage	Frequency	Percentage
<b>Gender</b>				
Male	67.0	89.3	75.0	100.0
Female	8.0	30.7	0.0	0.0
Total	75.0	100.0	75.0	100.0
<b>Age</b>				
21 – 30	27.0	36.0	3.0	4.0
31 – 40	35.0	46.7	37.0	49.3
41 – 50	8.0	10.8	22.0	29.3
51 – 60	2.0	2.7	13.0	17.3
Total	75.0	100.0	75.0	100.0

Mean	34.3		39.8	
Coefficient of variation	0.25		0.14	
Education				
Tertiary	33.0	44.0	20.0	26.7
Secondary	32.0	42.7	35.0	46.7
Primary	7.0	9.3	12.0	16.0
Non-formal	3.0	4.0	8.0	10.7
Total	75.0	100.0	75.0	100.0
Years of involvement				
1 – 5	27.0	36.0	19.0	72.0
6 – 10	48.0	64.0	56.0	28.0
Total	75.0	100.0	75.0	100.0
Mean	6.2		4.4	
Coefficient of variation	2.4		0.5	
Level of involvement				
Major	58.0	77.3	14.0	18.1
Minor	17.0	22.7	61.0	81.9
Total	75.0	100.0	75.0	100.0
Membership of Association				
Member	75.0	100.0	58.0	77.3
Non-member	0.0	0.0	17.0	22.7
Total	75.0	100.0	75.0	100.0

Source: Field Survey, 2009.

The table showed that most beneficiary respondents (89.3%) were male while all the non-beneficiary respondents were males. This implies that bee-keeping in the study area is basically a male dominated activity..The respondents were also found to be young and agile of average ages: 34 and 40 years for the beneficiary and non-beneficiary respondents respectively. Almost all the respondents (over 90.0%) had acquired the basic primary school education implying that they could easily comprehend and use new techniques in their bee-keeping enterprises. Most beneficiaries were involved in bee-keeping as a primary occupation: as a major means of livelihood. Only few of the non-beneficiaries majored in bee-keeping. However, most of the respondents were long experienced bee-keepers with

about 6 and 4 years of involvement for beneficiary and non-beneficiary respectively. All the beneficiary bee-keepers belonged to one multi-purpose cooperative or the other while only About three-quarters of the non-beneficiaries were cooperative members. As cooperative members beekeepers can pool their resources within their societies to be plough into beekeeping so that the issue of inadequate funds for investment is reduced to the barest minimum.

### **Nature of Credit acquired by Respondents**

The role of credit cannot be over emphasized in any agricultural business. Credit is a catalyst for the development of small scale holder agriculture as it provides additional financial resources that are needed for optimum farm production.

Table 5: Nature of Credit acquired by Respondents

<b>Nature of Credit</b>	<b>Beneficiaries</b>		<b>Non-beneficiaries</b>	
	Frequency	Percentage	Frequency	Percentage
<b>Access to Credit</b>				
Access	75.0	100.0	28.0	37.3
No Access	0.0	0.0	47.0	62.7
Total	75.0	100.0	75.0	100.0
<b>Amount of Loan ('000 Naira)</b>				
≥ 0	0.0	0.0	47.0	62.7
1 – 20	0.0	0.0	2.0	2.7
21 – 40	58.0	77.3	26.0	34.7
41 – 60	15.0	20.0	0.0	0.0
61 – 80	1.0	1.3	0.0	0.0
81 – 100	1.0	1.3	0.0	0.0
Total	75.0	100.0	75.0	100.0
Mean	<b>35.8</b>		<b>10.9</b>	

Coefficient of variation	0.3		1.3	
<b>Source of credit</b>				
Government (ESACA)	75.0	100.0	0.0	0.0
ESACA and formal	33.0	44.0	0.0	0.0
No credit	0.0	0.0	47.0	62.7
Formal	0.0	0.0	28.0	37.3

Source: Field Survey, 2009. Note: \$1 equals ₦140

Table 5 revealed that all beneficiary respondents had access to credit from ESACA and other formal sources. Average loan accessed was N36,000. Over one-third of the non-beneficiary respondents (37.3%) had access to credit obtained from formal institutions that averaged ₦11,000. Though bee-keepers obtained funds for their operations in the study area, the study findings reveals that very meager sum were accessed by the farmers. the sum could only be useful for small-scale bee-keeping activities. This is more so considering the inflationary trends in Nigeria's economy.

### Tools and Equipment

Table 6 shows the types of tools and equipments used by respondents.

Table 6: Tools and Equipment used by Respondents.

Equipments	Beneficiaries		Non-beneficiaries	
	Frequency	Percentage	Frequency	Percentage %
Hives and stand	75.0	100.0	75.0	100.0
Protective suit and head shield	75.0	100.0	75.0	100.0
Rubber Boot	75.0	100.0	75.0	100.0
Gloves	75.0	100.0	75.0	100.0
Cutlass	75.0	100.0	75.0	100.0

Beehive Tool	75.0	100.0	75.0	100.0
Smoker	75.0	100.0	75.0	100.0
Extractor	55.0	73.3	15.0	20.0
Presser	20.0	26.7	60.0	80.0
Sieve	20.0	26.7	60.0	80.0
Brush	75.0	100.0	75.0	100.0
Funnel	75.0	100.0	75.0	100.0
Bottle	75.0	100.0	75.0	100.0

Source: Field Survey, 2009.

The Table shows that both crude and modern tools were used by respondents, though the prevalence of improved tools was not pronounced. Popular implements employed were cutlass, knife and pressers and modern implements were smokers, extractors protective suit and head shield. These findings agree with Ogunleye (2006) that the art of beekeeping includes the use of both crude and modern tools. In addition to this it was revealed that forest lands for bee-keeping is a limiting. Table 7 indicates that about a quarter each of the beneficiary and non-beneficiary respondents were operating their bee-keeping activities on rented lands

Table 7: Sources of forest reserves used by respondents

Source of Forest reserve	Beneficiaries		Non-beneficiaries	
	Frequency	Percentage	Frequency	Percentage
Government ESACA	75.0	100.0	0.0	0.0
Borrowed	0.0	0.0	18.0	24.0
Leased	29.0	38.7	15.0	20.0
Inherited	14.0	18.7	48.0	64.0

Source: Field Survey, 2009.



### Costs and Returns Estimates

The costs and returns position of the two groups of beekeeper respondents are shown as in Table 8. The Table revealed that the average revenue were ₦186.6 and ₦156.6 per hive for beneficiary and non-beneficiary respondents respectively. Average costs of production were ₦31.7 and ₦30.7 per hive for beneficiaries and non-beneficiary respectively. Thus beekeeping was found to be more profitable under the ESACA scheme than outside the schemes with average returns to labour and management of ₦128.5 and ₦87.0 per hive for beneficiary and non-beneficiary respondents respectively. This could be as a result of the incentives enjoyed by the beekeepers beneficiaries. The interest rate on loan granted to beneficiaries was 10% lower than the interest rate of about 20% at which the non-beneficiaries obtain their own loan. Additionally, the beneficiary respondents also enjoyed a 6 months moratorium before they began to offset the ESACA loans collected. It is important to note however that the returns profile of both respondents is not that worthwhile, implying that more still needs to be done in terms of improving returns from beekeeping management practices in the study area.

Table 8: Summary of cost and returns

Items	Beneficiaries Average cost per hive (₦)	Non-beneficiaries Average cost per hive (₦)
Gross revenue	186.6	156.6
<i>Less</i>		
Total variable cost	30.1	30.7
<i>Equals</i>		
Gross margin	151.5	125.9
<i>Less</i>		
Imputed interest on loan	1.8	9.4
<i>Less</i>		
Imputed rent on forest reserve	5.3	6.7

<i>Less</i>		
Depreciation	12.0	15.0
<i>Less</i>		
Imputed cost of non-paid labor	3.9	7.7
<i>Equals</i>		
Returns to labor and management	128.5	87.0

Source: Field Survey, 2009.

### ESACA Credit Impact on Beekeeping Production

Regression analysis was carried out to determine the influence ESACA credit might have on the quantity of honey extracted by beekeepers. The results of the pooled regression are as shown in Tables 9.

Table 9: Summary of Pooled Regression Analysis for Respondents

Explanatory Variables	Quantity of honey extracted by Beekeepers			
	Linear	Semi-log	Double-log	Exponential
	function	function	function	function
	(1)	(2)	(3)	(4)
Constant	33.34* (1.97)	3.036*** (15.75)	7.081** (2.90)	212.3*** (5.491)
Production expenses (X <sub>1</sub> )	-1.24E-03* (-1.72)	-8.61E-05 (-1.04)	-0.787 (1.011)	-603.4*** (-7.30)
Household size (X <sub>2</sub> )	-0.625 (-0.25)	-0.088*** (-3.16)	0.025 (0.109)	54.26** (2.20)
ESACA membership (X <sub>3</sub> )	0.870 (0.342)	-0.999*** (-8.132)	1.154*** (8.44)	-2.119 (-0.146)
Year of involvement (X <sub>4</sub> )	4.276 (0.930)	0.033 (0.671)	1.255** (2.971)	220.2*** (4.91)
Number of hives (X <sub>5</sub> )	14.724*** (26.38)	-5.11E-03 (-0.802)	0.282*** (7.57)	1038.2*** (19.9)
R <sup>2</sup>	0.898	0.497	0.524	0.873

F-value	220.6	25.53	25.20	151.7
---------	-------	-------	-------	-------

Source: Field Survey, 2009. \*\*\*, \*\*, \* indicate t-values significant at 1%, 5% and 10% levels respectively. Figures in bracket are t values.

The Table result showed the variation in quantity of honey harvested as explained by the explanatory variables. Based on lead equation selection criteria/plausibility, the double-log function was chosen as the lead equation as equation 2. The double-log model indicates that the variable coefficients for household size, access to ESACA credit, years of involvement in beekeeping and the number of hives used have the expected positive sign while production expenses have the expected negative sign. Variables that are positively signed were expected to enhance the quantity of honey extracted by the respondents while variables with negative coefficients are expected to limit the quantity of honey extracted by respondents. Three of the variables: access to ESACA credit, years of involvement in beekeeping and the number of hives were found to be statistically significant at 1 percent level of significance, implying that these variables significantly affect the quantity of honey harvested by respondents the remaining variables; production expenses and household size were statistically insignificant implying that they did not significantly affect the quantity of honey harvested by respondents.

The model's  $R^2$  is 0.524 implying that the variables included in our model explained 52.4% variation in the quantity of honey harvested. The f-ratio is 25.209 and significant at 1% level implying that the joint effects of variables included in the model were significant.

$$\log Y = 7.081 - 0.787\log X_1 + 0.02532\log X_2 + 1.255\log X_3 + 0.282\log X_4 + 1.154D..(5)$$

$$(2.909) \quad (-1.011) \quad (0.109) \quad (2.971)** \quad (7.577)** \quad (8.442)**$$

\*figures in brackets are t-values

### Constraints Limiting bee-keeping Practices

During the course of the study, respondents reported constraints they faced in their bee-keeping enterprise. These problems were analysed and ranked as in Tables 10 and 11.

Table 10: Kruskal-Wallis Ranking of Constraints to Bee-keeping by Beneficiaries

Constraints	Mean rank	Rank
Inadequate credit	352.11	7
Pests and diseases	293.43	3
Bees aggressiveness	327.43	4
Bush burning	331.19	5
Absconding of Bees from hives	247.29	2
Theft by outsiders	247.29	2
Inadequate technical assistance	335.86	6
Poor market	159.63	1
Chi-squared ( $\chi^2$ )	<b>158.84</b>	
Degree of freedom	<b>7</b>	
Assmp. Sig.	<b>0.001</b>	

Source: Field Survey, 2009. 1 – 7 implies lowest to highest rank.

Table 11: Kruskal-Wallis Ranking of Constraints to Bee-keeping by Non-beneficiaries

Constraints	Mean rank	Rank
Inadequate credit	352.11	7
Pests and diseases	293.43	3
Bees aggressiveness	332.42	4
Bush burning	344.37	5
Absconding of Bees from hives	247.29	1
Theft by outsiders	264.13	2
Inadequate technical assistance	352.45	6
Poor market	264.13	2

---

Chi-squared ( $\chi^2$ )	<b>158.93</b>
Degree of freedom	<b>7</b>
Assmp. Sig.	<b>0.001</b>

---

Source: Field Survey, 2009. 1 – 7 implies lowest to highest rank.

The Tables show the ranking of constraints reported by the two groups of beekeeper respondents. Although the degree of prevalence of the constraints differs across the two groups, the respondents were being faced with similar set of constraints were inadequate credit, pests and diseases, bee aggressiveness, bush burning, absconding of bees, theft , inadequate technical assistance and poor market problems. All of these constraints were indicated as significant constraints. In case of the beneficiary respondents, the Chi-square ( $\chi^2$ ) is 158.848 and statistically significant at 1% level implying that the identified constraints were significant ones and statistically different from one another. For non-beneficiary respondents, the Chi-square ( $\chi^2$ ) is 158.937 and statistically significant at 1% level implying that the identified constraints were significant one and statistically different from one another.

## Conclusion

Despite the ESACA credit premium placed on bee-keeping in the Ekiti state, Nigeria, the industry still remains in a rudimentary stage. Though the bee-keepers are young agile men, who have had at least basic formal education and benefiting from their enterprise, their receipts is far below what could possibility encourage and sustain any meaningful commercial honey bee production. The bee-keepers are also faced with numerous constraints including inadequate credit, pests and diseases, bee aggressiveness, bush burning, absconding of bees, theft, inadequate technical assistance and poor market problems. Based on the study findings therefore, it is recommended that ESACA authority should extend its credit facilities

to more beekeepers. The Volume of loan and other credit facilities disbursed to these beekeepers should be increased to reasonably productive sums. The women folks should also be encouraged into the business. This can be achieved via incorporating more women into the ESACA scheme. As regarding the technical constraints, it is advocated that more extension agents should be recruited and readily available to help these beekeepers with the techniques required for optimum honey production. Bush burning by the hunters and other forest users during dry season should be discouraged by ESACA authorities especially in forest reserves while possibilities and avenues for the export of honey and bye-products should be sought, stimulated and encouraged, so as to increase the country's foreign earnings

## References

- Adekunle, A. O. "Unlocking the potential of small-scale farmers in Nigeria: The Extension key" A paper presented at the Faculty of Agriculture Lecture, University of Ilorin held on July 13, 2007. Pg 10-13.
- Adeyemi, T. O. "Statistical Techniques for Educational Research" Universal Publisher, Surulere, Lagos. 191-193 (2003):.
- Ajekigbe, J. M. "Financial Intermediation for unlocking Agricultural Potential in Nigeria". A PowerPoint Presentation held at First Bank Lagos, Nigeria on February 8, 2007.
- Akande, T. "An overview of the Nigerian Rice Economy". The Nigerian Institute of Social and Economic Research (NISER), Ibadan, Nigeria. Pg 1-11 (2003).
- Ayorinde, K. L. "Agricultural Development Option as Tool to fight hunger and underdevelopment: The Kwara State Approach". A Paper presented at the National War College 14<sup>th</sup> Geostrategic Study Tour to Kwara State. Conference Room, Governor's Office, Ilorin. 5 December, 2005. 17PP.
- Central Bank of Nigeria (CBN), Annual Progress Report 2006.
- Ekiti State Agricultural Credit Agency Information Manual for Loan Applicants. (ESACA, 1999)
- Fakayode, B. Segun, Omotesho, O.A, Tsoho, A. Bello and Ajayi, P, Dayo. 'An Economic Survey of Rural Infrastructures and Agricultural Productivity Profiles in Nigeria. *European Journal of Social Sciences* 7(2) (2008):Eurojournals inc. Eurojournals, Inc. England Available on-line at [http://www.eurojournals.com/ejss\\_7\\_2.htm](http://www.eurojournals.com/ejss_7_2.htm)
- Ogunleye, R. F. "Beekeeping and Aquaculture: the procedure" in Introduction to Entrepreneurship Development in Nigeria, University of Ado-Ekiti Press. Pg 140-153 (2006)..
- Oluwatusin, F. M. "Costs and Returns in Modern Beekeeping and honey production in Nigeria". *Medwell Pakistan Journal of Social Science*; 5(4): 310-315 (2006).
- National Population Commission, 2006 Census Reports.
- Nurosis, M. J/Statistical Package for Social Science (SPSS): "SPSS Base System User's Guide". Microsoft Corporation Chicago. Pg. 338-350.(1990).
- Wayne, D. W. "Applied Non-Parametric Statistics" Second Edition, PNS-Kent Publishing Company. Pg 226-235(1990)