

**AN ECONOMIC APPRAISAL OF AN IMPROVED METHOD
OF BEE KEEPING IN NIGERIA: A CASE STUDY OF THE
APICULTURE UNIT, FEDERAL COLLEGE OF
AGRICULTURE UMUDIKE.**

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ABSTRACT

This study evaluated the improved method of bee keeping at Federal College of Agriculture Umudike for a period of 3 years to determine the economics of bee keeping as a farming enterprise. The cost-route approach was used in data collection from 30 Langstroth hives used for the study. Data collected were analysed using gross margin and capital budgeting analytical tools. The results showed a gross margin of N6643.3 (1990), N10,6398 (1991) and N20,946 (1992). The gross margins were computed using the prevailing market prices during the study period. The investment analysis, also showed that bee keeping is economically feasible: (1 naira (N) = US \$0.1600 average for the period).

INTRODUCTION

The history of bee keeping in Nigeria is well documented (Meek, 1930; Taylor, 1942; Birket - Smith, 1957; Ayoade, 1977; Iridi-Obi, 1985; Nwali *et al.*, 1992). Bee keeping as an agricultural enterprise has a lot of potentials as a source of food. Several studies have explored the food value of honey (Knott 1941; Heydak 1944;

Vignec and Julia, 1954; Anon, 1971; Coggins, 1975; Segeral *et al.* 1991).

There is money in honey (Iridi-Obi, 1978). Smith (1960) referred to bee farmers as silent millionaires in Europe. Besides income, considerable medical literature exists on the use of honey and honey derivatives for the treatment of various disorders (Beck, 1935; Ainley, 1942; Seymour and West, 1951; Bulmar, 1955; Rubin *et al.* 1959;

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Blomfield, 1973 Iridi-Obi, 1986). Honey is a good export commodity. The world total exports rose from 150, 162 tonnes in 1975 valued at \$121 million to 269,402 tonnes in 1984, valued at \$256 million (FAO, 1977-1984).

Although bee keeping has the above potential benefits, its importance seems to have decreased as civilisation advanced. In Nigeria, organized bee keeping farms are very few and most of them have technical and personal problems. In order to provide solutions to these problems, the Federal College of Agriculture Umudike established an Apiculture Unit and offers six months short course on bee keeping to promote beekeeping among Nigerian farmers. There is now a campaign for the promotion of bee keeping with the formation of Nigerian Bee keepers Association in 1993.

The adoption of beekeeping as a farm enterprise entails that complete information including the profitability of bee keeping as an enterprise, should be provided. There is need to provide not only technical information but also economic justification for farmers to undertake bee keeping as an enterprise. At the moment there is scanty and outdated information on the economics of bee keeping in Nigeria.

This paper evaluates the economics of bee keeping, using the Apiary located at Umudike. The specific objectives are as follows:

- a. to estimate the costs and returns from bee keeping using improved methods;
- b. to determine the problems associated with bee keeping and
- c. to make recommendations on the strategies for promoting bee keeping in Nigeria.

MATERIALS AND METHODS

The data for the study were collected from the College Apiary using the cost-route approach. The bee species studied was Apis mellifera. A total of 30 Langstroth bee hives (45 x 38 x 28cm) were used for the study. The hives were mounted on stands and labelled for easy monitoring of honey yields from each hive.

The empty hives were set between April and July 1990 in different locations in citrus orchards, cassava plots and agro-forestry experimental plots in the College and National Root Crops Research Institute's Stations, respectively. The hives were externally inspected daily but internal inspections were weekly and monthly as the need arose.

The various bee keeping equipment used were costed and depreciated for those with longer

life span using the straight line method. The harvesting of honey was done between December and March each year. This is the period every hive is expected to have honey. The mean annual salary of one of the apirist on N3714 and the wages (at the prevailing rates) for two casual labourers were used in the calculation. The study covered a period of three years 1990 - 1992. The data collected were analysed using gross margin and capital budgeting tools.

RESULTS AND DISCUSSION

Honey and Beewax Production:

Table 1 shows the relative yields of honey beewax during the study period. The result shows that honey yield increased with the age of the colonies whereas there was an inverse relationship between beewax yield and age of the colony. It appears from this result that as the bees settle down in their new environment and the number of workers increased, the yield of honey increased too.

Table 1: Comparative Honey and Beewax Yield Per Season 1990-1992.

Years	Honey Yield/Season (Litres)	Beewax Yield/Season (kg)
1990	200	18
1991	206.7	16
1992	322	15
Average Yield/Year	242.9	16.3
Mean Yield/Colony	8.1	5.4

In the case of beewax, as more honey is stored, little is left for beewax production because it has been estimated that almost 6-7 pounds of honey is used for one pound of beewax (Ibok Bassey, 1989). Table 1 also indicates that the average yield per colony was 8.1 litres. This is above the African average yield of 8 litres (Segeren et al. 1991).

Gross Margin Analysis:

The estimated gross margins for the 30 hives were N6643.3, N10,639.8 and N20,946 for 1990, 1991 and 1992 respectively (Table 2). These were based on the prevailing market prices during the study period. The result shows that the gross margins increased over the years. The bee hive has a life span of about 5 years or more depending on nature of the wood used. The

result suggests that an investor should expect higher returns in later years of the project. The gross margin is not a sufficient tool for estimating the profitability of a farm because the fixed costs are

not included in its calculation, hence the need for investment analysis.

Table 2: Gross Margins for 30 hives for the study Period 1990-1992.

Item	Years		
	1990 N	1991 N	1992 N
<i>Gross Revenue</i>			
Beewax	1,620	1200	1,350
Honey	6,112	11,561	21,775
Total	7,732	12,761	23,125
<i>Variable Costs</i>			
Sugar	175	175	400
Jam	65	75	200
Common Salt	150	150	150
Duplicating paper	50	70	-
Matches	7.5	7.5	7.5
Omo	7.3	7.3	7.3
Toilet Soap	50	50	50
Casual Labourers	340	510	680
Bottles	100	800	400
Sub total V.C.	944.8	1844.5	1894.8
<i>Interest on Operating Capital</i> (15% small scale Holder)	143.9	276.7	284.2
Grand Total V. C.	1088.7	2121.2	2179
Gross Margin	6643.3	10,639.8	20,946

Investment Analysis:

The estimated gross output, costs and returns for the period of 3 years of the improved method of bee keeping is shown in Table 3. These are based on data collected during the period of this study (1990-1992). The result shows that the apiary made a negative return (N499) in the first year of

operation. This may be due to the new environment from which the bees were operating as well as the initial high investments in the first year of the project. The bees needed time to locate sources of nectar and an increase in bee population in order to increase honey production. However, as the colony advanced in age there was substantial

increase in honey production and consequent increase in net

returns (N3242 in 1991 and N13,307.4 in 1992).

Table 3: Estimated Gross Output, Costs an Returns from 30 hives 1990-1992 (in Naira)

Item	Years		
	1990 N	1991 N	1992 N
<i>Gross Revenue</i>			
Beewax	1,620	1200	1,350
Honey	6,112	11,560	21,775
a) Total Gross Revenue	7,732	12,761	23,125
<i>Operating Costs</i>			
Sugar	175	175	400
Jam	65	75	200
Common Salt	150	150	150
Duplicating papers	50	70	-
Matches	7.5	7.5	7.5
Omo	7.30	7.30	7.30
Toilet Soap	50	50	50
Bottles	100	800	400
Casual Labour	340	510	680
b) Total Operating Costs	944.8	1844.8	1894.8
<i>Fixed Costs</i>			
Helmet (Straw hat and veil)	30	40	40
Smoker	50	50	50
Rainbooth	46.7	46.7	46.7
Plastic Can (Small)	6.7	6.7	6.7
Cheese cloth (15m)	50	50	50
Labels (1000)	33.3	33.3	33.3
Defoaming Can	64	64	64
Plastic Can (large)	20	20	20
Harvesting Can (Iron)	68	68	68
Cutlass (2)	53.3	53.3	53.3
Metal file (2)	13.3	13.3	13.3
<i>Item</i>			
Bee Brush	10	10	10
Bee suit	133.3	133.3	133.3
Plastic Bucket (3)	30	30	30
Inspect net (2)	33.3	33.3	33.3
Bee hive (30)	1920	1920	1920
Linch foam (2)	80	80	80
Queen trap	66.7	66.7	66.7
c) Total fixed Costs	2708.6	2718.6	2718.6
Apirist salary P. A.	3504	3714	3924
Total Cost (b + c)	7157.4	8277.4	8537
d) Interest on Capital (15%)	1073.6	1241.6	1280.6
e) Total costs (b + c + d)	8231	9519	9817.6
Net Returns (1 - e)	-499	3242	13,397.4

Table 4 presents the cash flow and the Net present value (NPV) analysis of the improved method of bee keeping. The results indicated that at the given costs of capital (15%, 18%, 25% and 35% respectively) the Net Present Values of the cash flows were positive (N10,773.2 and N10,009.3, N8,489.1 and N6,812.9

respectively). The current interest rate for direct production in Agriculture is 18% (NACB Umuahia 1993). The implication of this result is that bee keeping is economically feasible and is advisable for farmers to invest in it.

Table 4: Cash Flow and Net present value analysis of improved method of bee keeping [(No Terminal Values) Values in Naira]

Year	Net Cash Flow	Discount Factor at 15%	Net present Value at 15%	Discount Factor at 18%	Net present value at 18%	Discount Factor at 25%	Net present Value at 25%	Discount Factor at 35%	Net present value at 35%
1990	-499	0.870	-434.13	0.847	-422.7	0.800	-399.2	0.741	-369.8
1991	3242	0.756	2451	0.718	2327.8	0.640	2074.9	0.549	1779.9
1992	13307.4	0.658	8756.3	0.609	8104.2	0.512	6813.4	0.406	5402.8
			10,773.2		10,009.3		8,489.1		6,812.9

Problems Associated with Bee keeping in Nigeria:

A number of problems were encountered during the study. The first problem was that of predators which include wax moth, wall gecko, lizards, and termites. The control measure applied was the use of salt or spent engine oil around the hives. No chemical pesticides were used as these also affected the bees.

Environmental problem was another factor that militated against bee keeping. It was observed that when the weather was too hot or too cold, the tendency was for the bees to

abscond from the hives. To avert this, the hives were relocated in some cases and shade provided in other cases. On the other hand, where the environment was too cold as was the case with hives located in thick bushes, the trees around the hives were either cut to let in light or the hives were relocated.

Bush fire, particularly during the dry season was yet another problem. To avert this, the surroundings in which the hives were located during the dry season were cleared. The problem of farm and wild animals was also there. There were cases when the hives were pushed down by

cattle. The same applied to other wild animals where the hives were placed on their route. The hives were protected from animals by fencing around their locations.

CONCLUSION

The study analysed the economic viability of bee-keeping in Nigeria using improved technology. The results confirm that bee keeping is a viable economic venture in Nigeria.

The result has a number of policy implications. Firstly, land is a limiting factor to increased agricultural production in some States in Nigeria. Since hives occupy minimal space, the campaign for bee-keeping among Nigerian farmers should be directed more to these States. Secondly, the high rate of

unemployment among Nigerian youths can be reduced by encouraging them to engage in bee keeping, subsidized by government.

Finally, the government should encourage the various Nigerian Colleges of Agriculture to incorporate bee-keeping into the curriculum, through increased funding.

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