A COMPARATIVE ANALYSIS OF BEEKEEPING AND CROP PRODUCTION IN ADAMAWA STATE, NIGERIA

MUHAMMAD R. JA'AFAR-FURO*
DEPT. OF AGRIC. AND NATURAL RESOURCES, FUFORE LOCAL GOVERNMENT AREA, ADAMAWA STATE, NIGERIA.
E-MAIL:jaafarfuro@yahoo.com
Phone No.:+237-08036047153

ABDURRAHMAN SULEIMAN
TRAINING AND PLANNING DEPARTMENT, BAUCHI STATE AGRICULTURAL DEVELOPMENT PROGRAMME, BAUCHI, NIGERIA

YUSUF EL-SAHAB HONG
PLANNING DEPT., MINISTRY OF AGRICULTURE, HEADQUARTERS, YOLA, ADAMAWA STATE, NIGERIA.

ABSTRACT

A comparative analysis of the beekeeping industry and crop production in Adamawa State, Nigeria was conducted to determine the more profitable form of sustainable income for small-scale farmers. Data were collected from 120 traditional beekeepers across the state who engaged in both forms of farming. Farm budgeting analysis and descriptive statistics revealed that beekeeping was a far more profitable and cost effective form of farming among the respondents. The investment return on beekeeping was 9.12 compared to 0.40 for crop production. It is therefore, recommended that apiculture should be adopted by various governments as a strategy towards addressing the issue of low income among the less privileged farmers especially where farm inputs and soil fertility are major problems.

Keywords: Adamawa, Analysis, Beekeeping, Comparative, Nigeria

INTRODUCTION

The scourge of desertification has had devastating effects in the northern states of Nigeria including Adamawa State. This destruction results from the removal of the natural plant cover that serves as good source of soil fertility through sedimentation with sand dunes of the Sahara desert to the gradual extinction of water bodies, (rivers, streams etc) through excessive evaporation, resulting from inadequate trees/plants along the banks to conserve moisture. These conditions lead to poor agricultural output in general and consequently impoverishment of the people since the state is mostly agrarian. The search for sustainable forms of farming, which will be complementary and also improves the biodiversity, therefore becomes imperative. Hence, this study in Adamawa State.

MATERIALS AND METHODS

This research was conducted in Adamawa State in the northern part of Nigeria during the 2002/2003 and 2003/2004 cropping seasons (2 years). Two (2) Local Government Areas (LGAs) where beehive products are mostly produced and crop production more pronounced were chosen from each of the four (4) agricultural zones of the state. A list of 120 traditional beekeepers was drawn randomly across the study area, with 30 respondents from each zone to give a wide spread. Eight (8) well-trained enumerators (forestry officers in each LGA) collected the data through a cost-route method using structured questionnaires and interviews under the supervision of the three researchers for two (2) years (2002-2004). The data were collected from farmers who were both beekeepers and crop producers. Farm budgeting and descriptive statistics were used in analyzing the data. A straight-line depreciation was applied on the fixed cost items before inclusion in the computation. All the figures used were averages of the 2 years study period except for the fixed cost items. As the research focused on the benefits accruable to beekeepers, only colonized beehives were considered.

RESULTS

Table I: Beekeepers' Crop Production activity and Income Derived From It, in Adamawa State, Nigeria

TYPE OF CROP	AREA CULTIVATED BY ALL BEEKEEPERS (hectre)	INCOME REALISED BY ALL BEEKEEPERS(₦)*
Sorghum	75.1(17.42)	693,987.5(12.94)
Rice	90.3(20.94)	1,484,230.0(27.68)
Maize	127.7(29.62)	1,599,530.0(29.83)
Sugar Cane	14.5(3.36)	146,904.5(2.74)
Groundnuts	45.6(10.58)	562,100.0(10.48)
Cowpea	26.1(6.05)	289,910.0(5.41)
Cassava	19.4(4.50)	111,025.0(2.07)
Millet	15.0(3.48)	168,750.0(3.15)
Bambara nuts	4.1(0.95)	59,900.0(1.12)
Vegetable	2.8(0.64)	46,250.0(0.86)
Potatoes	5.8(1.35)	63,000.0(1.17)
Yams	3.8(0.88)	124,500.0(2.32)
Beniseeds	1.0(0.23)	12,400.0(0.23)
Total	431.2(100)	5,362,487.0(100)
Average	3.59	44,687.39

Note: Values in Parentheses show percentage of the total
Naira= ₦150: US$1
Source: Field Survey (2002-2004)

Table II: Beehive Crops Yields Per Season and Income realized by Beekeepers in Adamawa State, Nigeria

Item	Honey	Beewax	Gross Revenue (Naira:₦)
Cummulative Yield for all the the beekeepers.	28,880.68 litres	3,128.27kg	-
Cummulative number of beehives used by all the beekeepers	3,253	3,253	-
Revenue realized by all the beekeepers (₦*)	10,163,338.50	2,596,711.95	12,760,050.45
Average Yield per colony	8.88 litres	0.96kg	-
Average Revenue realized, per beekeeper (₦*)	84,694.49	21,639.27	-
Average number of beehives per beekeeper	27	27	-

Note: Naira =₦150:US$1
Source: Field Survey (2002-2004)

Table III: Computed Costs and Returns to Apiaries in Adamawa State, Nigeria

Item	Value in Naira (₦)*	Percentage of Gross Revenue and Total Cost
Revenue		
Honey	10,163,338.50	79.65
Beewax	2,596,711.95	20.35
Gross Revenue	12,760,050.45	100
Variable Costs (VC)		
Casual Labour	568,470.00	45.10
Baiting materials	181,427.20	14.39
Cost incured in solving environmental problems	122,369.00	9.71
Control of Pest & Predators	98,780.00	7.84
Batteries	13,580.00	1.08
Corn stock	25,410.00	2.02
Matches	1,785.00	0.14
Total Variable Costs (TVC)	**1,011,821.20**	**97.60**
Fixed Cost (FC)		
Beehives (3252)	217,513.20	17.26
Buckets	19,660.00	1.55
Torch light	6,247.50	0.50
Ropes	5,110.00	0.41
Total Fixed Cost (TFC)	**248,530.70**	**2.40**
Total Cost, TC, (TVC + TFC)	**1,260,351.90**	**100**
Net Return, NR, (GR – TC)	**11,499,699.25**	-
Return on every Naira Invested ($^{NR}/_{TC}$)	**9.12**	-

* ₦140:US$1

Source: Field Survey (2002-2004)

Table IV: Computed Costs and Returns to Crop Production Enterprise in Adamawa State, Nigeria

Item	Income Realized by 120 beekeepers(₦)*	Area Cultivated by 120Beekeepers (hectre)
Revenue		
· Cereals	4,870,807.50(90.83)	384.90(89.26)
· Root crop	298,525.00(5.57)	29.00(6.73)
· Fibre	193,154.50(3.60)	17.30(4.01)
Gross Revenue (GR)	**5,362,487.00(100)**	**431.20(100)**
Variable Costs (VC)		
· Labour		
Land Clearing	336,336.00(8.77)	-
Land ploughing	733,040.00(19.12)	-
Planting	294,601.50(7.68)	-
First weeding	603,680.00(15.75)	-
Second weeding	431,200.00(11.25)	-
Third weeding	301,840.00(7.87)	-
Spraying	4,900.00(0.13)	-
Harvesting	344,960.00(9.00)	-
Threshing/Bagging	129,360.00(3.38)	-
Transportation	172,480.00(4.50)	-
· Seeds	25,872.00(0.67)	-
· Herbicides	11,500.00(0.30)	-
· Insecticides	8,950.00(0.23)	-
· Fertilizer/Animal Waste	45,000.00(1.18)	-
· Bags	12,000.00(0.31)	-
Total Variable Costs (TVC)	**3,455,719.50(90.15)**	**-**
Fixed Cost (FC)		
· Ox-drawn plough	12,000.00(3.13)	-
· Oxen	250,000.00(6.52)	-
· Hoes	4,500.00(0.12)	-
· Matchets/Axes/Cutlasses	3,270.00(0.09)	-
Total Fixed Cost (TFC)	**377,770.00(9.85)**	-
Total Cost, TC(TVC + TFC)	**3,833,489.50(100)**	**-**
Net Return, NR(GR – TC)	**1,528,997.50**	**-**
Return on every Naira invested ($^{NR}/_{TC}$)	0.40	-

Note: Values in Parentheses show Percentage of total in each category.
Naira*: ₦150:US$1
Source: Field Survey (2002-2004)

DISCUSSION

The crop production and beekeeping yields and incomes are shown in Tables I and II respectively. In Table I, the farmers cultivated a total area of 431.2ha to realize a yield equivalent of ₦5,362,487 from growing cereals, root and fibre crops. In Table II, a total of 3252 beehives (log: 2187, straw: 941, clay pot: 105, gourd: 20) were used by 120 beekeepers to obtain 28880.68 litres of honey and 312.2kg of beeswax worth ₦10,163,338.5 and ₦2,596,711.95 respectively. This implied that with just an average number of 27 beehives, a beekeeper made an average of ₦84694.49 and ₦21639.27 from sales of honey and beeswax, respectively. On the other hand, only ₦4468.39 was realized as an average revenue from cultivating an average land area of 3.59ha for cereals, root and fibre crops.

The implication of the above results is that given the two types of farming, beekeeping is a better enterprise, generating a higher income for peasant farmers. These findings agreed with Dalang (2001) who noted that on a comparative basis, apiculture stands out conspicuously as a high revenue-generating venture compared to arable cropping. Tables III and IV show the investment analyses of beekeeping and crop production, respectively. Of the gross revenue in Table III, 79.65% was from honey and 20.35% was from beeswax. In Table IV, 90.83% and 3.60% were accounted for by cereals, root and fibre crops, respectively. This implied that the major outputs of the two (2) enterprises were honey for beekeeping and cereals for crop production during the two (2) production seasons in the study area. Furthermore, labour accounted for 45.1% of the total costs for beekeeping (Table III) compared to a much higher 87.45% for crop production labour costs (Table IV). Earlier studies by Nweke and Winch (1980), and Okorji and Obiechina (1985) are consistent with our result. They documented labour as a major limiting factor in peasant agriculture in Nigeria, accounting for over 70% of the total cost of production in most farming operations in rural settings. Arene (1995) puts labour as the most expensive farm input in a labour intensive economy like Nigeria.

Similarly, ₦11,499,699.25 was the net return from apiaries (Table III) compared to only ₦1,528,997.5 from crop production (Table IV). Also, the return on every Naira invested was 9.12 for beekeeping (Table III) and 0.40 for crop production (Table IV). This finding is consistent with Eluagu and Nwali (1999) and Farinde *et al* (2005) who also reported in separate surveys in the southern parts of Nigeria that the majority (over 86%) of the respondents confirmed that honey production was a viable and highly profitable enterprise. (Beekeeping there was generally traditional.)

Beekeepers acquired their beehives through various means, which include construction from local materials, purchase and inheritance or combination of these. Swarms were baited with attractants such as honeycombs, dead rodents, cow dung, perfumes, variety of scented herbs and fruit juice. Harvests were

conducted by using smoke from cornstalks to calm bees at night. Only a few bees were usually killed in this process. However, this procedure is now considered a serious offense by all local governments in the state. Farmers sold their beehive products either at home or in local markets usually to middlemen and a few consumers. Therefore, the price of beehive products, cereals and fibre crops, fixed and variable costs were determined locally.

LIMITATION OF THE STUDY

Although data were collected through a cost-route method, instances arose especially during harvest periods when beehive products were either consumed or given out as gifts between field visits. The amount of these products was usually not accurately accounted for by the beekeepers because these amounts were mostly based on memory. Nevertheless presumably the error in the estimations was approximately the same for beekeeping and crop production. The study was limited to only eight Local Government Areas (LGAs) of the state instead of all 21 LGAs due to time and financial constraints.

CONCLUSIONS

This comparative study indicated that beekeeping is a high income generating enterprise compared to crop production even with the traditional practices used by the farmers. Therefore to counter the effects of poverty and to improve the living standard of the rural farmers in the study area, beekeeping should be encouraged among the local people. The governments should as a matter of urgency introduce modern beekeeping methods (top-bar beehives), which will be sustained taking into account the abundance bee plants in the locality.

ACKNOWLEDGEMENTS

The authors are highly indebted to the Fufore Local Government Council, Adamawa State, Nigeria and the Adamawa State Local Government Services Commission, Nigeria, for the financial support.
Thanks are extended to all the forestry officers who participated in the data collection.

REFERENCES

[1] Arene, C.J., Measurement of Resource Productivity and the Efficiency of labour-use among smallholder Rice farmers in Nigeria. Modeling, Measurement and Control 12 (1995) No. 2:1-13.

[2] Dalong, M., Apiculture and Poverty Alleviation. Plateau Agricultural Development Programme, PADP, Newsletter 4 (2001) No. 5:6-9

[3] Eluagu, L.S., Nwali, L. N., An Economic Appraisal of an Improved Method of Beekeeping in Nigeria. A case study of the Apicultural Unit, Federal College of Agriculture, Umudike, Nigeria. Nigerian Agriculture Journal 30 (1999), 99-144.

[4] Farinde, A J., Soyebo, K.O.,Oyedokun, M.D., Exploration of Beekeeping as a Copping Strategy in a Deregulated Economy. Journal of Agricultural Extension 8 (2005), 76-80

[5] Nweke, F.I., Winch, T.E., Bases for Farming Resource Allocation in Smallholder Cropping System of South Eastern Nigeria: A case study of Awka and Abakaliki Villages. Discussion paper, Agricultural Economics. IITA, Ibadan, Nigeria (1980) 80:4

[6] Okorji, E.C., Obiechina, C.O., Bases for farmer Resource Allocation in the Traditional Farming System: A Comparative study of Productivity of farm Resource in Abakaliki Area of Anambra State, Nigeria. Agricultural System 17 (1985), 197-210