



## **Analysis of Income and Constraints to Chilli Pepper Production in Kaduna State, Nigeria**

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### **Author's contribution**

*The sole author designed, analyzed and interpreted and prepared the manuscript.*

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### **ABSTRACT**

The study determines the contribution of chilli pepper to household farm income and constraints associated with its production. The study was carried out in three local government areas in Kaduna state, Nigeria between August and November 2014 cropping season. Purposive and random sampling techniques were used for data collection and descriptive statistics was used. The results showed that 53% of chilli pepper farmers had formal education; the majority of the farmers (72%) do not participate in any chilli pepper related cooperative association. The 98.5% of chilli pepper farmers financed their production from personal savings and that 58.5% are visited by extension agents. The findings of the study showed that chilli pepper has the highest contribution to household farm income and production is yet to be maximized since several constraints still limit its production. The most severe problems included price fluctuation and high cost of farm inputs while pest and diseases and inadequate capital followed respectively. Chilli pepper production was declining and this is attributed to the speculative activities of middlemen that cause price fluctuations and high cost of farm inputs. It is therefore, recommended that chilli pepper farmers should join cooperative societies to enable them procure farm inputs at the subsidized rate.

**Keywords:** *Chilli pepper; constraints; price fluctuation; cost of inputs; production; Kaduna state.*

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## 1. INTRODUCTION

Agriculture in Nigeria is dominated by the small scale farmers who are engaged in the production of the bulk of food requirements of the country [1]. In spite of the fact that these small scale farmers occupy a unique and pivotal position, they belong in the poorest group of the population and as such cannot invest much on their farms [1]. According to [2], the vicious circle of poverty among these farmers has led to the unimpressive performance of the agricultural sector.

In the past two decades agricultural sector in Nigeria has contributed an average of 39% of the country's Gross Domestic Product and employing nearly 60% of its workforce. Over 80% of the country's population living in the rural areas is directly or indirectly dependent on agriculture for its livelihood [3]. Thus, resources must be used much more efficiently, which entails eliminating waste, thereby leading to increase in productivity and incomes [4].

Chilli pepper (*Capsicum frutescens*) is a high value crop that is grown for cash by farmers all over the world [5]. Nigeria is known to be one of the major producers of pepper in the world accounting for about 50 percent of the African production [5].

Nigeria has good soils and weather that can readily support the growth and production of pepper. Pepper grown in Nigeria is in high demand because of its pungency and good flavour. It can readily be dried, ground and packaged for export. Investing in pepper production is one of the ways of sourcing for foreign exchange [6]. Exportation of pepper in Nigeria has once been reported to be a lucrative business [5]. The major area for its production is the Northern region between latitudes 10°N and 12°30'N. Pepper is utilized mostly for culinary purposes and seasonings. It also has medicinal uses, internally as a stimulant and carminative and externally as a counter-irritant [7].

Despite the economic importance of pepper in terms of income generation to farmers hence there should be a valid economic reason to boost its production. Farmers are interested in total profit made from the farm not putting in to cognizance which of the crops gives the highest level of profit or at what percentage each crop is contributing to overall profit, this will encourage them to improve in productivity enhancement in

order to maximized profit. It is very important to carry out an investigation to ascertain some of the major constraints associated with it production and ways by which increased chilli pepper production can be achieved and contributed to the farmer's livelihood. Based on the above facts, the study was undertaken to determine the contribution of chilli pepper to household farm income and constraints face by chilli pepper farmers.

## 2. MATERIALS AND METHODS

### 2.1 Study Area

The study was conducted in three local government areas of Kaduna state namely Ikara, Kubau and Soba. These areas are located in the Northern guinea savannah ecological zone of Nigeria and they were chosen because about 80% of the farmers in the area are chilli pepper farmers [8].

Kaduna state lies between latitudes 09°02' and 12°32' North of the equator and between longitudes 06°15' and 08°50' East and the state shares boundaries with Katsina and Kano state to the north, Plateau to the north east, Nasarawa and Abuja to the south and Niger and Zamfara state to the west [8]. The state has a total land area of about 4.5 million hectares, with an estimated total arable land of about 2.02 million ha comprising 1.94 million ha upland and 0.08 million ha lowland. There are two distinct seasons in the state namely wet and dry seasons. Wet season generally spans from April to October, while dry season falls between October to March. The average rainfall is about 1,482 mm, while temperature ranges from 35°C-36°C during the humid period to as low as 10°C-23°C during the hamattan periods of November – February [8].

Kaduna state vegetation is divided into Northern Guinea Savanna and Southern Guinea Savanna. The soil is developed from undifferentiated complex igneous and metamorphic rocks. The fine top soil couple with reasonable organic matter in it enhances the fertility status, especially the southern part of the state. The physical properties of the soil are moderately good and allow continuous cropping for a variety of crops such as maize, rice, sugar-cane, ginger, sorghum, millet, soya-beans and groundnut. In 2011 the total number of households in the state that grew pepper stood at 84,471 [8].

## 2.2 Sampling Procedure

A multi stage sampling technique was employed to select the respondents for the study. In the first stage, Ikara, Kubau and Soba local government areas were purposively selected out of local government areas on the basis of being the most prominent producing areas of chilli pepper in the state [8]. In the second stage, two villages were purposively selected from each of the three local government areas because of the large number of chilli pepper farmers in the areas. In the third stage, simple random sampling non replacement method was employed to select 10% of the population of chilli pepper farmers in each of the villages; this resulted to a sample of 200 respondents used in the study.

## 2.3 Data Collection and Analysis

Primary data were collected through interview method with the aid of a structured questionnaire. Parameters included farm size, quantities and prices of various production inputs used in chilli pepper, quantity of chilli pepper produced and its price, and constraints faced by the farmers. Similarly, information on the quantity and price of other crops produced by chilli pepper farmers, as well as quantities and prices of various production inputs used in producing such crops during the period under review were obtained and used in the study to estimate the percentage contribution of chilli pepper and other crops to the household farm income of chilli pepper farmers in the area.

## 3. RESULTS AND DISCUSSION

Results revealed that 37.5% of the chilli pepper farmers were within the age range of 30-39 years with mean of 46 years (Table1). This implies that the farmers can participate actively in farming activities and this is in line with the findings of [9] who reported that younger farmers are more flexible to new ideas and risk; hence they are expected to adopt innovations more readily than older farmers. Results on education showed that 47% of chilli pepper farmers had no formal education, while 30% of the respondents are within 1-6 years of education which means they had only primary education, and 15.5% had secondary education while 7.5% had tertiary education. This indicates that the farmers' educational level is low. This finding is at variance with Amaza results [10].

The majority of the farmers (33.5%) had household size that ranged from 6-10 persons. The average household size was 11 persons implying that there is appreciable number of family labour supply to accomplish various farm operations. Farming experience is another important socio-economic factor that can bring about increase in productivity. The result shows that 24% of chilli pepper farmers had an experience of 6-10 years, 18.5% of the respondents are within 11-15 years of farming experience while 17.5% of the respondents are within 1-5 years of farming experience which means that chilli pepper farmers in the study area had vast experience in their production.

Results on cooperative membership shows the number of years spent by the farmers in cooperative association. About (72%) of chilli pepper farmers do not participate in any chilli pepper related cooperative association and the reasons for this include: Being small scale and unawareness of any association while 28% participated with average of 1.7 years. The effect of this result is that most of the chilli pepper farmers in the study area do not enjoy the assumed benefits accrued by co-operative societies through pooling of resources together for a better expansion, efficiency and effective management of resources and for profit maximization. Ekong [11] and Ajayi [12] stated that membership of cooperative societies has advantages of accessibility to micro-credit, input subsidy and also as avenue in cross breeding ideas and information.

The results in Table 1 shows that 98.5% of chilli pepper farmers financed their production from personal savings while 1.5% sourced credit, through Bank of agriculture. The low access to credit could be attributed to the fact that government seldom grants financial credit to farmer. Ekong [11] reported that credit is a very strong factor that is needed to acquire or develop any enterprise; its availability could determine the extent of production capacity. It also agrees with findings of Nasiru [13] who noted that access to micro-credit could have prospect in improving the productivity of farmers and contributing to uplifting the livelihoods of disadvantaged rural farming communities. The result revealed that 41.5% of chilli pepper farmers in the study area are not visited by extension agents while 58.5% are visited with an average of a single visit and this could be attributed to increased extension agent-farmers' ratio by the KADP in the study area.

### 3.1 Contribution of Chilli Pepper to Household Farm Income

The main economic activities in the study areas were crops production. The summary of the contribution of chilli pepper to household farm income is presented in Fig. 1. The net average household farm income is derived from the total net revenues of chilli pepper and other crops produced by chilli pepper farmers for the year under review. The relative contributions of the various farm income sources are shown in Fig. 1.

The information obtained indicates that chilli pepper contribution is 42% of total household farm income in the study area this agrees with the findings of Suleiman and Isah [14] which reported that the importance of pepper production to food security especially in Nigeria is of significant importance for continued sustenance of improved agricultural productivity. Then followed by maize with 10.7%, rice (9.8%), soya beans (7.6%) and other crops (sorghum,

groundnut, onion, sugarcane, cowpea and tomatoes), about 30%. This finding provides enough evidence for the chilli pepper farmers to reallocate some resources into production of chilli pepper if only they view efficient utilisation of resources, profit and income as their main goals.

### 3.2 Constraints Associated with the Chilli Pepper Production in the Study Area

The problems faced by chilli pepper farmers in the study area were ranked according to their severity as stated by the farmers in Table 2. Price fluctuation was the most severe constraint of chilli pepper producers with about 42% of the respondents attesting to this fact. Speculative activities of marketing middlemen were responsible for price fluctuation by chilli pepper producers and this agrees with the findings by Suleiman and Isah [14] that frequent price variations of chilli pepper is major concern to producers, marketers and consumers.

**Table 1. Socio-economic characteristics of chilli pepper farmers in the study area**

Variable	Frequency (N=200)	Percentage
<b>Age (Years)</b>		
20-29	5	2.5
30-39	75	37.5
40-49	37	18.5
50-59	58	29.0
60 above	25	12.5
Min	22	
Max	80	
Mean	46	
SE	0.71	
<b>Educational status</b>		
No formal education	94	47.0
1-6	60	30.0
7-12	31	15.5
13 Above	15	7.5
<b>Household size</b>		
1-5	42	21.0
6-10	67	33.5
11-15	50	25.0
16-20	21	10.5
21-25	12	6.0
26-30	4	2.0
>31	4	2.0
Min	1	
Max	40	
Mean	11	
SE	0.53	

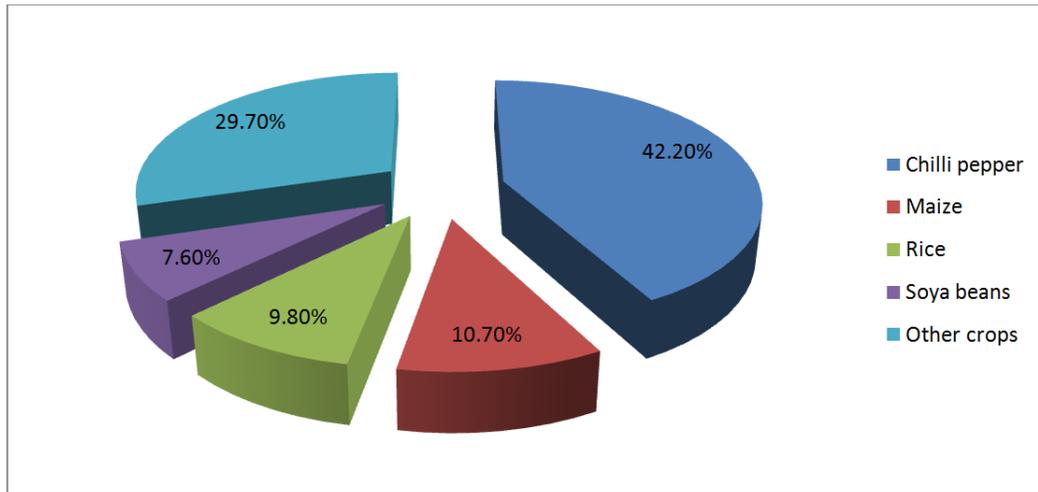
Variable	Frequency (N=200)	Percentage
<b>Farming experience</b>		
1-5	34	17.0
6-10	48	24.0
11-15	37	18.5
16-20	19	9.5
21-25	22	11.0
26-30	14	7.0
>31	26	13.0
Min	1	
Max	50	
Mean	17	
SE	0.81	
<b>Membership of cooperative society</b>		
Non members	144	72.0
1-5	24	12.0
6-10	30	15.0
>11	02	1.0
Min	0	
Max	15	
Mean	1.7	
SE	0.23	
<b>Source of capital</b>		
Informal	197	
Formal	3	98.5
Min amount of credit	0	1.50
Max amount of credit	150000	
Mean amount of credit	1750	
SE amount of credit	1025.89	
<b>Extension visit</b>		
No visit	83	41.5
1-2	91	45.5
3-4	25	12.5
>5	1	0.5
Min	0	
Max	5	
Mean	1	
SE	0.08	

N=Number of respondents

**Table 2. Constraints associated with the chilli pepper production in the study area**

Constraint	*Frequency	Percentage	Rank	Coping strategy
Price fluctuations	84	42	1	Join cooperative association and storage
High cost of inputs (fertilizer, labour and seed)	84	42	1	Use of poultry droppings, cow dung's, family labour and use of improved seed
Pest and diseases	58	29	3	Use of insecticide and wood ash
Inadequate capital	33	16.5	4	bank's loan and savings
Total	272			

\*Multiple responses allowed



**Fig. 1. Contribution of chilli pepper to total household farm income (Field survey, 2014)**

Chilli pepper related groups were formed as a coping strategy in order to maintain price stability. High cost of inputs (fertilizer, labour and seed) were also perceived to be most severe constraint of chilli pepper producers with about 42% of the respondents attesting to this fact. According to the respondents, fertilizer is made available when farmers are far into the production period, sometimes at the middle of the raining season and family labour was predominant in the study area and that is why there was acute shortage of labour.

According to the farmers, during active period of production every household would have been engaged in their farms. It was noted that the demand for labour is normally very high and expensive during the peak period of land clearing, ridging, harvesting, processing and weeding. Pest and disease was another severe constraint of chilli pepper producers with about 29% of the respondents attesting to this fact. Leaf coloration, premature falling of pod and seed dormancy were responsible for pre-harvest and post-harvest losses by chilli pepper producers and use of insecticides and wood ash were coping strategy to ameliorate this problem while about 16% of the respondent were moderately severe with lack of capital to expand their production and this constraint was ameliorated through banks loan and savings.

#### 4. CONCLUSION

Price variation and high cost of inputs (fertilizer, labour and seed) were the major constraints hindering the production of chilli pepper.

#### 5. RECOMMENDATIONS

Based on the findings, it is therefore recommended that chilli pepper farmers should join cooperatives to enable them procure farm inputs at subsidized rate and should properly dry and store the pepper when the prices are low and sell when prices are high.

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#### COMPETING INTERESTS

Author has declared that no competing interests exist.

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