

## Original Article

# Problems and prospect of onion production in Kajuru local government area, Kaduna state, Nigeria

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### ABSTRACT

This study focuses on the analysis of problems and prospect of onion production in Kajuru local government area of Kaduna state, Nigeria. A multi stage sampling technique was employed for collecting primary data from a sample of 100 onion farmers in the study area. Analytical tools used were; descriptive statistics and farm budgeting models using net farm income estimates. Findings indicated that most of the farmers were male and all of the farmers (100%) were in their working and active age (21–60 years) and have had substantial experience in onion production. The net farm income analysis showed that onion production was profitable (N 552, 474.00 K/ha). However, lack of farm inputs, market glut, and climatic problem were identified as the most significant constraints hindering onion production among the respondents in the study area, while lack of credit facilities was the least constraints identified. It is therefore concluded that all the various constraints reported by the farmers should be addressed forthwith, to make production of onion in the study area on the increase. Onion farmers should be encouraged to form cooperative societies so as to enable them obtain loans from commercial banks and agricultural and rural cooperative bank, at regulated interest rate and to also allow them to put their resources together to solve problems of high cost and lack of farm inputs.

**Keywords:** Analysis, constraints, costs, onion, return

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## INTRODUCTION

Onion (*Allium cepa* L.) is an important spice crop in Nigeria. It is extensively cultivated as a winter crop.<sup>[1]</sup> The total area under onion cultivation and its production are not satisfactory to meet the domestic demand and the country has to import thousands of tons of onion every year.

Among the major problems facing onion farming, low level of income, bad road network, lack of fertilizer has also posed threat to onion farming. Onion production has increase farmers income, and provides food and shelter to many households in Nigeria. The average yield of onion per hectare is very low compared to that of other developed countries. Cultivation of onion requires large amounts of fertilizers, and excessive use of chemical fertilizers increases the production cost and degrades the environment. Onion is not known with certainty as a wild plant. Nigeria like any other developing country is faced with rapid population growth and expanding urban population which

increase demand on agricultural production.<sup>[2]</sup> In Nigerian economy, Onion has become an important cash crop cultivated in virtually all the irrigable land of all the agro-ecological zones from North-east to the North-west.<sup>[3]</sup>

Onion (*A. cepa*) is a popular vegetable grown for its pungent bulbs and flavored leaves. The bulb is composed of concentric, fleshy enlarged leaf bases, or scales. The outer leaf bases lose moisture and become scaly and the inner leaf generally thickens bulbs develop. The green leaves above the bulb are hollow and arise sequentially from the moisture at the innermost point at the base of the bulb. The stem is very small and insignificant during vegetative growth. It has fibrous root system spreading beneath the soil surface to a distance of 30–46 cm.

Onions' position in the Nigerian markets is remarkable as it is marketed to the southern part of the country and marketed for export.<sup>[4]</sup> The demand for onions remain constantly increasing considering market size of the country with land size of

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923,768 square kilometer (km<sup>2</sup>) with variety of soils and a total population of 174,557,539 persons and growth rate of 2.54%. Onion is virtually used daily in homes, hotels, schools, and hospital as vegetable as stated by.<sup>[5]</sup>

Onion production in Nigeria is very high compare to other crops, capital intensive and also required technical know-how compared to other vegetables, the level of tool used in our production process is very limited, lack of good fertile soil for planting, lack of capital, inadequate manpower, the relatively poor performance of onion production in the country is constrained by a number of factors such as soil disease, climate, and weeds. Among these factors, disease, pest, and weed control is most important as it has been reported to be responsible for between 70% and 89% losses in the bulb yield.<sup>[6]</sup> Most of the onion produces uses subsistence tools, that are require in less quality. Onion production required adequate capital and resources efficiency to obtained high level of demand and supply respectively.

The use of herbicides has been tried and observed to reduce labor requirement and its attendant's costs, facilities, efficient weed control and also increase profitability in onion production.<sup>[7]</sup> Onions are highly perishables, since they are extremely sensitive to heat and humidity. They require much care from harvest to transport, with special attention for packing and storage. The poor state of road coupled with administrative wrangling, slow down the progress of delivery trucks, impairing the quality of merchandise and adding to costs. In view, of these the study seeks to examine the problem and prospect of onion (*A. cepa* L.) production in Kajuru Local Government Area of Kaduna State.

## METHODOLOGY

### Study Area

The project was carried out in Kajuru local government area in Kaduna State, Nigeria. Its headquarters are in the town of Kajuru (Ajure). The local government is located on longitude 9° 59'N and 10° 55'N and latitude 7° 34'E and 8° 13'E, with an area of 2464 km<sup>2</sup>. It was carved out of Chikun Local Government Area in March 1997 by the military administration of Gen. Sani Abacha's regime. At creation, it was made up of two traditional districts, Kajuru and Kufana. Additional districts were created, bringing the number to 14 districts.<sup>[8]</sup> Kajuru Local Government shares boundaries with Igabi Local Government Area to the North, Chikun Local Government Area to the West, Kauru Local Government Area to the East, Zangon Kataf Local Government Area, and Kachia Local Government Area to the South-West and South, respectively. Kajuru LGA has 96 localities with 53 km away. Kajuru local government area has a census population of 109,810; comprising 54,506 male and 55,304 female.<sup>[8]</sup> The area is marked with two distinct seasons of wet and dry season; the

wet season commences in the month of April while dry season extends from October to March and is marked by the hot dry north eastern harmattan winds. Farming is the main occupation of the people of Kajuru and it is characterized predominantly by mixed cropping, crops such as maize sorghum, millet, cowpea, rice, cassava, coco yam, sugarcane, tomato, pepper, acha, ginger, and potato are cultivated. Rain-fed agriculture is mostly practiced in the area with little fadama agriculture. Crop production is still manually done in small-scattered pieces of land with the use of implements such as hoes, cutlasses, knives, and axes with very few medium and large-scale farmers that are engaged in tractor ploughing which is visible along access roads.

### Method of Data Collection

Primary data were used for the study. Data were obtained using well-structured questionnaires that was administered to 100 randomly selected onion farmers in the study area. The questionnaire was used to draw information on issue of onion production in the study area.

### Sampling Techniques

Multi-stage and random sampling procedures were adopted to select respondents for the study. The first stage was random selection of five districts out of the ten districts in the Local Government Area, the districts selected were as follows; Idon, Buda, Kasuwan Magani, Kajuru, and Kufana, The second stage involved purposive selection of one villages each from the selected district where onion farming is been intensively cultivated. The selected were Idon, Buda, Kasuwan Magani, Gyngynere, and Kufana, random sampling was then used to select 20 respondents each among the population of onion farmers in the selected villages in the study area which gave a total of 100 respondents.

### Analytical Techniques

Simple descriptive statistical tools and net farm income analysis were used to analyzed the data collected.

### Simple Descriptive Statistics Tools

Simple descriptive statistics such as frequency distribution, percentages, and mean were used to present result of objective (i) and (iii).

### Net Farm Income Analysis

Net farm income analysis was used to estimate the profitability of onion production in the study area.

The net farm income analysis is specify as:  $NFI = GM - TFC$

Where:

$GM = TR - TVC$

NFI – Net farm income from onion production in Naira.

GM = Gross Margin from onion production in Naira  
 TR = Total Revenue obtained from onion farming in Naira  
 TVC = Total variable costs associated with onion production in Naira  
 TFC – Total fixed costs associated with onion production in Naira (depreciated value)

## RESULTS AND DISCUSSION

### Socio-Economic Characteristics of Respondents

#### Age of respondents

The result of age distribution of the respondents is presented in Table 1. The result showed that 56.0% of the cassava farmers fall between the age levels of 21 and 30 years, 32.0% of the onion farmers were in the age range of between 31 and 40 years and 12.0%, were between 41 and 50 years. The result shows that all of onion farmers sampled (100.0%) were in their working and active age with the mean age of 31.79 years of age, hence age may likely have positive impact on onion production in the study area. Abubakar<sup>[9]</sup> reported that the age of a farmer is a very important factor in agriculture because it can be used to determine the type of agricultural activities performed by the farmers.

#### Gender of respondents

The result of gender distribution of the respondents is presented in Table 1. The result reveals that 66.0% of the onion farmers in the study area were male while only 34.0% were female. This could attributed to the fact that onion production is tedious and stressful, hence may be more suitable for males than the females. This result was in agreement with the work of<sup>[10]</sup> that leadership roles visa-vise decision making are dominated by the men folk.

#### Marital status of respondents

The result of marital status of the respondent is presented in Table 1. The results indicated that 51.0% of the farmers were married, while about 40.0% of them were single, 6.0% were widow, and 3.0% of the respondents were divorcee. This revealed that majority of the farmers were married which therefore meant that they had family members to care for. It also showed that most of labor required for onion production may be provided by the family. The result obtained in this study opined with the findings of Ojo and Jibowo<sup>[11]</sup> who reported that married people are responsible individual whose views are highly respected within rural communities in Africa.

#### Household size of respondents

Table 1 shows that about 38.0% of the respondents had a household size that ranges between 1–5 and 6–10 persons, respectively. About 15.0% of the respondents had a household size that ranges between 11 and 15 persons and 9.0% of the respondents had a household size that ranges between 16

**Table 1: Socio-economic characteristics distribution of the respondents**

Variable	Frequency (F)	Percentage
Age range		
21–30 years	56	56.0
31–40 years	32	32.0
41–50 years	12	12.0
Mean age		
31.79 years		
Gender		
Male	66	66.0
Female	34	34.0
Marital status		
Single	40	40.0
Married	51	51.0
Divorcee	03	03.0
Widow	06	06.0
Household size		
1–5 persons	38	38.0
6–10 persons	38	38.0
Mean household size		
11–15 persons	15	15.0
16–20 persons	09	09.0
7.82 persons		
Educational level		
No formal education	09	09.0
Primary education	18	18.0
Secondary education	15	15.0
Tertiary education	58	58.0
Year of experience		
1–5 years	50	50.0
6–10 years	26	26.0
11–15 years	12	12.0
16–20 years	12	12.0
Mean experience		
7.74 years		
Total	100	100.0

Field survey, 2022

and 20 persons. The results revealed that majority (62.0%) of the respondents had a large household size that is above 6 people with a mean value of 7.82 persons which shows that their labor need may be provided by the family. This high household size means that farmers have the manpower and capacity to cultivate on a large scale. Kamara *et al.*<sup>[12]</sup> have established that household sizes are on average large in northern Nigeria.

### Educational level of respondents

The result of the educational level of the respondents is presented in Table 1. The results showed that 58.0% of the onion farmers had tertiary education, 18.0% had primary education while 15.0% of them possessed secondary school certificates and about 9.0% of the farmers had no formal education. This showed that majority (91.0%) of the onion farmers were educated. This implied that most of the farmers can read and write which will help them in interpreting in recommended rate of fertilizer and chemicals that needed to be applied to their onion plants following the producer instructions. The high level of education may also leads to better management especially in the area of record keeping. Farmer's efficiency in using information on new production technique increases with education and thus, their productivity.<sup>[13]</sup>

### Years of experience of respondents

The result of years of experience of respondents is presented in Table 1. The result revealed that 50.0% of the respondents had 1–5 years' experience in onion farming 26.0% had 6–10 years' experience, 12.0% had been into onion farming for as long as between the ranges of 11–15 and 16–20 years, respectively. This result showed that half (50.0%) of the onion farmers in the study area had an experience in onion farming that is 6 years and above with a mean farming experience value of 7.74 years which made them to have good knowledge of onion cultivation as well as having good management skill just as the saying goes that experience is the best teacher. This also implies that farmers with longer years of experience are less cautious of undertaking new risk, thus implore and adopt new method to enhance their willingness and eagerness to economic position. The result of this study in which the mean value of 7.74 years of experience in onion farming was obtained contradicts the findings of Yahaya *et al.*<sup>[14]</sup> that reported a mean value of 23.03 years of experience for farmers in Aliero local government area of Kebbi state, Nigeria.

### Source and Size of Farm Land

#### Source of farm land

Table 2 below shows the distribution of respondents based on source or ownership of farm land. The table revealed that 46.0% of the onion farmers got their farm land through inheritance, 25.0% of the respondents got their farm land through rent, 20.0% of the onion farmers purchased their farm land from land owners out rightly, 6.0% of the farmers obtained their farm land as gift, while the remaining 3.0% of the onion farmers are on leasehold system of land tenure. The result revealed majority (72.0%) of the onion farmers in the study area owned their farm land either through inheritance, purchased and gift which may be an advantage in the production of onion because the issue of fighting over land ownership is removed which is one of the problem militating against the success of farming across the country.

**Table 2: Distribution of the respondents based on land ownership and farm size**

Land source and Size	Frequency (F)	Percentage
Land ownership type		
Inheritance	46	46.0
Purchase	20	20.0
Gift	06	06.0
Rented	25	25.0
Leasehold	03	03.0
Farm size (hectare)		
0.1–0.9	24	24.0
1–1.9	58	58.0
2–2.9	18	18.0
Total	100	100.0

Field survey 2022

### Farm size

Table 2 below shows the distribution of respondents based on size of their farm. About 58.0% of the respondents had farm size that was between the ranges of 1 and 1.9 ha, 24.0% of the onion farmers had farm size that was <1 ha, while the farm size for 18.0% of the onion farmer's ranges between 2 and 2.9 ha. The result also revealed that the mean value for farm size in the study area was 1.17 ha. This clearly showed that all of the onion farmers in the study area were small scale farmers that probably produce onions at subsistence level to feed their family and sells when there is surplus. The size of farmland is another important component in the adoption literature. According to Bamire *et al.*,<sup>[15]</sup> a large farm size gives farmers the space to experiment with new varieties, which improves adoption of new ideas and innovations.

### Costs and Revenue Associated with Onion Farming in the Study Area

The cost and revenue associated with onion production per hectare of farm land cultivated in the study area are presented in Table 3. The result revealed that a total of thirty seven thousand one hundred and eighty five naira (N 37,185.00 K) was expended on fixed items for 1 ha of land put under onion production, two hundred and eighty nine thousand, four hundred and seven naira spent on variable items (N 289,407.00 K) and a total of three hundred and twenty six thousand, five hundred and ninety two naira (N 326,592.00 K) total production cost per hectare was expended. A total of eight hundred and seventy nine thousand, sixty six kobo (N 879,066.00 K) was realized on 1 ha of cultivated onion as total revenue which gave a gross margin value of five hundred and eighty nine thousand, six hundred and fifty nine naira (N 589,659.00 K) and a net income of five hundred and fifty two thousand, four hundred and seventy four naira (N 552,474.00 K) realized per hectare of onion cultivated which was considered as the profit made

**Table 3: Costs and revenue associated with onion farming per hectare in the study area**

Cost	Estimated mean value
Fixed cost (depreciated value)	
Sprayers	12,009.00
Containers	2,274.00
Farm tools	6,278.00
Farm land	16,624.00
[A]. Total fixed cost	37185.00
Variable cost	
Onion seeds/seedlings	38,092.00
Fertilizer and organic manure	116,637.00
Agrochemicals	27,776.00
Labour	90,252.00
Transportation	16,750.00
[B]. Total variable cost	289407.00
[C]. Total cost (A+B)	326,592.00
[D]. Total revenue	879,066.00
[E]. Gross margin (D-B)	589,659.00
[F]. Net farm income (profit) (E-A)	552,474.00

per hectare of farm land cultivated by the onion farmers. The result revealed that onion farming in the study area is highly profitable and can serve as another source of revenue for the farmers to meet their financial obligations.<sup>[14]</sup> In their study also reported that onion production was highly profitable with a net farm income of four hundred and nine thousand, six hundred and forty-two naira and twenty-five kobo (N 409,642.25 K). The estimated profit in this study was similar to that of Yahaya *et al.*<sup>[14]</sup> and others report.

### Constraints in Onion Production

The most significant constraint hindering onion production by the farmers in the study area was lack of farm inputs such as improved onion seed, fertilizer, herbicides, and pesticides. The result in Table 4 showed that majority of the farmers (92.0%) of the respondents were constrained by this lack of farm inputs, which was ranked as the first constraints hindering onion production in the study area. Market glut ranked second among the constraints hindering onion farming in the study area with 84.0% of the respondents identified it as a problem to them. It is a known fact that in Nigeria, there are periods when markets are usually flooded with onions and became surplus and cheap. This glut usually resulted in the reduction of both the revenue and profit of the farmers. The climate problem such as lack of rainfall and extreme high temperature that ranked third was another constraints identified by 81.0% of the onion farmers, inadequate rainfall and extreme high temperature also hindered the proper development of the onion plant. Lack of farm inputs, market glut, and climatic problem

**Table 4: Distribution of respondents according to constraints militating against onion production**

Constraint	Frequency (F)*	Percentage
Climatic problem	81	81.0
Lack of farm inputs	92	92.0
Lack of credit facility	03	03.0
Market glut	84	84.0
Lack of processing facility	06	06.0
Lack of start-up capital	12	12.0
Lack of preservation or storage facility	12	12.0
Pest and disease infestation	09	09.0

Field survey, 2022. \*multiple responses

were the three major constraints identified in this study. Other constraints that were not a serious issues includes: lack of start-up capital (12.0%), lack of storage and preservative facilities (12.0%), incidence of pests and diseases infestation (9.0%), lack of processing facility (6.0%), and lack of credit facilities (3.0%). These were identified by the respondents as minor constraints affecting onion production in the study area. Grema and Gashua<sup>[16]</sup> also identified high cost of farm inputs and limited access to improved onion seeds as major constraints confronting onion farmers along river Komadugu area of Yobe state, Nigeria.

### CONCLUSION

The results indicated that majority of the onion farmers in the study area were males, married and they are in their active ages. The study also showed that most of the respondents were small-scale farmers, but with good experience in onion production. The respondent's made good farm profit, with an average net farm income of ₦552,474.00 per hectare of farm land cultivated of onions. This shows that onion production in the study area is profitable venture. However, lack of farm inputs, market glut, and climatic problem were identified as the most significant constraints hindering onion production among the respondents in the study area, while lack of credit facilities was the least constraints identified. It is, therefore, concluded that all the various constraints reported by the farmers should be addressed forthwith, to make production of onion in the study area on the increase which will consequently, leads to positive enhancement of the living standard of the farmers, and guaranteed food security. The following recommendations are therefore been proposed based on the findings of this study; onion farmers should be encouraged to form cooperative societies so as to enable them obtain loans from commercial banks and agricultural and rural cooperative bank, at regulated interest rate and to also allow them to put their resources together to solve problems of high cost and lack of farm inputs, research on viable methods of storing and preserving of

onion should be encouraged among agricultural engineers and food technologist to solve storage and preservation problems, mechanism ensuring availability of inputs such as pesticides, fertilizers, improved, and viable onion seeds and herbicides should be instituted by the government, given the importance of onion farming, so that production and productivity may be improved, onion processing industries should be established in the area to manage the massive supply of onion during the period of glut and supply of irrigation equipment at subsidy price to the onion farmers by the government and other stakeholders should be encouraged to tackle climatic problem such as inadequate rainfall.

## REFERENCES

1. Satter II, Haque AG. Economic analysis of onion production alongriver Komaduga Area of Yobe State, Nigeria. *IOSR J Agric Vet Sci* 2005;7:5-11.
2. Nasiru MI. Economic Analysis of tomato Marketing, A Case Study of Kano Metropolis, Kano State” M.sc Thesis (unpublished). Department of Agricultural Economics. Nigeria: Bayero University Kano; 2000. p. 34-46.
3. NEAZDP. North East Arid Zone Development Programme, Borno and Yobe States. In: Annual Program me Evaluation Report Series No.8. NEAZDP; 1999. p. 38.
4. Muhammad F. Determinants of technical, allocative and economic efficiencies among onion producing farmers in irrigated agriculture: Empirical evidence from Kobo District, Amhara region, Ethiopia. *Afr J Agric Res* 2011;10:2180-9.
5. Hussaini MK, Islam MS, Miah MA. Returns to investment in summer onion research and extension in Nigeria. *J Agric Econ* 2015;32:49-61.
6. Warren P. Prediction at available heavy metals by six chemical extraction in a sewage study-amended soil. *Common Soil Sci Plant Anal* 2005;22: 2119-36.
7. Peter W. Introduction to Agriculture. Cambridge: University Press; 2006. p. 123-38.
8. National Population Commission-NPC. Provisional Census figure of Yobe State: Abuja: National Population Commission/ FGN; 2006. p. 32.
9. Abubakar I. Resource use efficiency in yam production in Northern part of Taraba State Nigeria. *J Econ Sustain Dev* 2004;6:25.
10. Makarau SB. Socio-economic Factors Affecting the Adoption of Ginger Farming Innovations in Kaduna State Agricultural Development Project (KADP) Zone II Samaru-Kataf. Unpublished M.Sc. Thesis. Bauchi: Abubakar Tafawa Balewa University; 2011. p. 45-68.
11. Ojo MA, Jibowo AA. Socio-economic characteristics influencing role performance of rural community power actors in agricultural extension delivery system in Osun state, Nigeria. *J Agric Rural Dev* 2008;2:27-40.
12. Kamara AY, Kamai N, Kanampiu F, Reuben A, Jajua M, Kadafur IM. The Adoption of Soybean in Northern Nigeria: The case of Kaduna State. Ibadan, Nigeria: International Institute of Tropical Agriculture; 2018. p. 37.
13. Amaza PS, Maurice DC. Identification of factors that influence technical inefficiency in poultry egg production in Ondo State. Nigeria *J Rural Econ* 2005;10:85-93.
14. Yahaya K, Gindil AA, Buhari AK, Umar HS. Profit and technical efficiency estimation of onion farms in aliero local government area of Kebbi State, Nigeria. *Direct Res J Agric Food Sci* 2019;7:30-5.
15. Bamire SA, Abdoulaye T, Amaza P, Tegbaru A, Alene AD, Kamara AY. Impact of promoting sustainable agriculture in borno (Prosab) program on adoption of improved crop varieties in borno State of Nigeria. *J Food Agric Environ* 2010;8:391-8.
16. Grema IJ, Gashua AG. Economic analysis of onion production along river Komadug area of Yobe state, Nigeria. *J Agric Vet Sci* 2014;7:5-11.z



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