International Journal of Science and Technology Research Archive

ISSN: 0799-6632 (Online)

Journal homepage: https://sciresjournals.com/ijstra/

(RESEARCH ARTICLE)

Check for updates

Assessment of profitability and risk management in vegetable production in Ogun State, Nigeria

Akinbola Adeyose Emmanuel *

Department of Agricultural Economics, Adekunle Ajasin University, P.M.B 001, Akungba-Akoko, Ondo State, Nigeria.

International Journal of Science and Technology Research Archive, 2021, 01(02), 029–035

Publication history: Received on 07 September 2021; revised on 15 October 2021; accepted on 17 October 2021

Article DOI: https://doi.org/10.53771/ijstra.2021.1.2.0045

Abstract

The study examined the performance and risk management of vegetable production in Ogun State, Nigeria. A multistage sampling procedure was used to select 120 respondents for the study. Data were collected through a well-structured questionnaire and personal interview schedule. Descriptive statistics and inferential statistics such as Ordinary Least Square (OLS) were used for the analysis of this study. The results found out that lack of discriminating pricing system, conflict in policy making, and high cost of inputs affect the market prices and as well serve as the main production risks that were observed by the farmers in the area. The average cost incurred for the production was about ₦6,908, while the total revenue accrued was ₦41,751. The gross margin and net farm income realized per production season were ₦36,973 and ₦34,843, respectively. The value (6.0) of return on investment showed that farmers realized times six of their investment. The variables such as household size, farm size, fertilizer application and equipment were the main determinants of vegetable production in the area. Also, the main challenges faced by the farmers were the infestation of pests and diseases, inadequate funds and climate change consequences. Therefore, it is recommended that the vegetable farmers should be encouraged through technical training on innovative approach to price determination and forming of functioning market structure in the area.

Keywords: Risk; Profitability; Production; Vegetable; Smallholders; Nigeria

1 Introduction

Agriculture remains the pillar of the Nigerian economy for growth, development, poverty alleviation, contribution to GDP, employment and income generation [1]. It is very important amongst the most vital segments of the economy as it utilizes more than 60% of the working populace undernourished in the developing regions of the world [2, 3]. Specifically, daily food consumption consists of mainly cereals, horticulture roots and tubers. This poor feeding habit predisposes the people to infections and such disease as typhoid fever, heart, liver and kidney disease due to poor body defense mechanisms. Among the wide range of agricultural crops vegetables occupy an important place because of their economic potentials [4]. The term 'vegetable' applies to those plants and plant parts that are edible, especially leafy or fleshy parts that are usually eaten with staples as main courses or supplementary foods in cooked or raw forms. It is estimated that there are at least ten thousand (10,000) plant species used as vegetables worldwide although only about fifty (50) are of great commercial value [5].

Vegetables are crops that can be easily grown, most of which generally take less time to mature. They are one of the major sources of food consumed by humans and these constitute an important source of food for both human and animal consumption. Although, the actual quantity of carbohydrates, proteins, minerals and fats may be limited and varies from one vegetable to another, the real value of vegetables generally lies in the minerals, vitamins and fibre content [2].

* Corresponding author: Akinbola Adeyose Emmanuel
Department of Agricultural Economics, Adekunle Ajasin University, P.M.B 001, Akungba-Akoko, Ondo State, Nigeria.

Despite the economic potential of vegetable in terms of food productivity and income generation, the vegetable industry still faces many challenges that limit the optimal production in the area. Access to agricultural credit has been positively linked to agricultural productivity in several studies. Yet this vital input has eluded smallholder farmers in Nigeria. Banks with large loan funds are generally difficult for smallholder farmers to access. Problems with collateral and high interest rates appear to frequently screen out most potential rural smallholder beneficiaries. In addition, agricultural loans are often short-term with fixed repayment periods, a loan structure that is not suitable for annual cropping or livestock production. Horticulture supply chains are patchy as a majority of farmers are small and marginal with very limited landholdings resulting in a small amount of produce that poses transportation problems resulting in a greater reliance on intermediaries in the process of bringing the produce to the central markets. Again, pest and diseases affect fruits and vegetables in the field and subsequently reduce their shelf lives and affect their appearance which is one important aspect of horticultural crops. Fruits and vegetables are vulnerable to bacterial. The rationale behind the study is that it will help new entrants into the industry to make informed decisions about which production line to choose. Therefore, the broad objective of this study is to empirically examine the performance and risk management in vegetable production in Ogun State, Nigeria. The specific objectives of the study are to:

- examine the risk management in the production of selected vegetable in the area;
- estimate the costs and returns of selected vegetables in the area;
- examine the factors affecting the production of vegetable production in the area; and
- identify the main constraints faced by the farmers in the course of production.

2 Material and methods

Ogun State is one of the six States that made up the Southwest, Nigeria. Ogun State have over 3,751,140 population (NPC, 2006). The nicknamed "Gateway to Nigeria", was given as a result of having a high concentration of industrial estates and being a major manufacturing hub in Nigeria. Ogun State is predominantly Yoruba, with the Yoruba language serving as the lingua franca of the State. The State is also noted for huge agricultural production most especially food crops such as vegetables, cereals, and some tree crops and poultry like eggs, fowls, goats, sheep among others. Primary data were used for this study. The data were sourced through the aid of a well-structured questionnaire and personal interview schedule. A multi-stage sampling procedure was used in selecting the sample size. In stage one, purposive sampling was used to select five (5) Local Government Areas (LGAs) based on their prominence in vegetable production and marketing in the State. They were Adoodo Ota (Otta), Imeko Afon (Imeko), Ipokia (Ipokia), Yewa North (Ayetoro) and Yewa South (Ilaro). They were also recognized as major vegetable production areas, where vegetable farmers and marketers can be found in the State. The second stage of the sampling involved random selection of four (4) communities from each LGA. Again, stage three also involved random selection of six (6) respondents from each of the community, making a total of 120 vegetable farmers which were randomly selected to make the sample size for the study. Data analysis was carried out using both descriptive and inferential statistics.

Budgetary technique/Gross margin Analysis- it was used to estimate costs and returns. Here, farm gate prices, total revenue, and total cost were collected from the respondents. The farm budgeting model will be expressed as:

$NP = TR - TC$

Where: NP = Net Profit, TR = Total Revenue, TC = Total Cost of Production i.e. Fixed Cost + Variable Cost.

Marginal Revenue was used to determine factors affecting vegetable production in the area.

In estimating the parameters of socio–economic characteristics, the explicit production function relating income realized from the sales of fruit crop (Y) to some explanatory variables (X_i) shall be expressed. The multiple linear regression model was adopted and used as follows:

$$Y = bo + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + e_i$$

Where Y = Output from Vegetable (kg)

X_1 = Age (years)

X_2 = House hold size (numbers)

X_3 = Years of farming experience (years)

X_4 = Education (years spent in school)

X_5 = Marital status (married = 1 and 0, otherwise)

X_6 = Labour (mandays)

X_7 = Equipment (Naira)

X_8 = Land size (ha)

X_9 = Fertilizer (Kg)

Note. $\hat{Y}i$ = the estimated value for the dependent variable in the year i,

3 Results and Discussion

3.1 Risk Management in the Production of Selected Vegetable in the Area

The sum percentage of the respondents choosing strongly agreed and agreed were grouped to be the percentage of the respondents that agreed with the statement while those that chose disagreed and strongly disagreed were grouped to be disagreed. The mean value of each statement was estimated and used in ranking the statements as shown in Table 1.

Table 1 Management Risk in Vegetable Production

Risk	Strongly disagree		Disagree		Agree		Strongly agree		Mean	Rank
	F	%	F	%	F	%	F	%		
Lack of discriminating pricing system based on quality and grade of produce will affect market price	16	13.3	17	14.2	50	41.7	37	30.8	2.90	1st
Conflict in policy making may affect market structure or market price	16	13.3	12	10	69	57.5	23	19.2	2.82	2nd
High cost of inputs may affect the market price	11	9.2	17	14.2	78	65	14	11.7	2.79	3rd
Output price fluctuation may lead farmer out of farm business or may not produce more goods	22	18.3	28	23.3	29	24.2	41	34.2	2.74	4th
Perish ability of produce will affect the market price	22	18.3	9	7.5	81	67.5	8	6.7	2.62	5th
Illness or death of operator may cause delay in production	31	25.8	16	13.3	59	49.2	14	11.7	2.46	6th
Damage by pest and disease will affect the product	18	15	64	53.3	28	23.3	10	8.3	2.25	7th
High cost of credit will affect production	84	70	24	20	12	10	0	0	1.40	8th

Source field: survey 2021

The results revealed that 95% of the respondents (1st) agreed that lack of discrimination in pricing system based on quality and grade of the product will affect market price and hence serve as risk. The second rank was conflict in policy making which may affect market structure or market price since about 98.3% of them agreed it could lead to a management risk. The third rank was high cost of inputs which may affect the market price and 95.0% of the respondents agreed with the statement to be a risk in vegetable production. About 71.7% of them (4th) agreed that

output price fluctuation may lead farmer out of farm business or may not produce more goods as a risk. Nearly 85% of the sampled respondents (5th) agreed that perishability of produce will affect the market price as a risk. The sixth rank was illness or death of operator which may cause delay in production and this was agreed by about 83.4% of them as a risk. The seventh rank was damage by pest and disease which would affect the product was also reported by 95% of the sampled farmers agreed to be as a risk. Nearly 86.6% of them (8th) agreed that high cost of credit will affect production and this will serve as a risk.

3.2 Analysis of Cost Structure and Net Farm Income of the Vegetable Production

The cost items incurred in the vegetable enterprise were grouped into variable and fixed costs. The variable cost considered include expenses on labour, fertilizer and transportation. While the fixed cost which were at depreciated costs and they were: cutlass, hoe, watering can, and sprayer. The average cost per plot of vegetable production was presented in Table 2. The Table showed that hired labour cost accounted for about 45.0% of the total cost, family labour accounted for 4.2%, fertilizer and transport cost accounted for 15.7% and 4.1%, respectively. [6] also reported high cost of labour in crop enterprise. The total fixed cost accounted for only 30.6% of total cost, while the variable cost accounted for 69.0%. The average variable cost was ₦4,778, while the average fixed cost depreciated accounted ₦2,130 for the last production season in the study area. The revenue of vegetable was ₦41,751 while the net farm income was ₦34,843 with the gross margin of ₦36,973. The return on investment was estimated to be 6.0 which indicated that for every ₦1 invested, the average farmer will make ₦6. This signifies that vegetable production in the study area is highly profitable. Similar results were found out by [7] in their study among fish farmers in Nigeria.

Table 2 Results of Budgetary Technique for Vegetable Production

Variable cost item	Cost (₦)	Percentage (%)
Total variable cost		
Hired labour	3,112	45.0
Family labour	295	4.3
Fertilizer	1,086	15.7
Transport	285	4.1
TVC	4,778	69.2
Total fixed cost (Depreciated)		
Cutlass	700	10.1
Hoe	950	13.8
Watering can	338	4.9
Sprayer	142	2.1
TFC	2,130	30.8
TC	6,908	100.0
Total Revenue = Price ×quantity		
Total Revenue	41,751	
Gross Margin	36,973	
Net farm income (NFI) = TR-TC	34,843	
Return on investment (ROI)=TR/TC	6.0	

Source: Field Survey, 2021

3.3 Factors Affecting Production of Vegetable in the Area

According to Table 3, multiple regression model was used to estimate factors affecting vegetable production in the study area. The model has a R^2 of 0.609 and this implies that about 61% of the total variation in the output of the vegetable is accounted for by all the explanatory variables in the regression model. Secondly, out of all the nine (9) variables, only four (4) variables were significant and positive in affecting vegetable production in the area. The variables such as

household size, equipment, farm size and fertilizer were positively significant; this implies that these variables are the factors that directly affect vegetable production in the study area. A unit increase in any of these variables will increase output vis-à-vis net farm income accrued from the vegetable production.

Table 3 Results of the Multiple Regression Model

Variables	Coefficients	standard error	p-value
(Constant)	9.127	.357	.000
Age of respondent (X_1)	.007	.007	.312
House hold size (X_2)	.054	.025	.032**
Farming experience (X_3)	-.004	.009	.631
Education (X_4)	-.034	.043	.432
Marital Status (X_5)	-.110	.071	.121
Labour (X_6)	-.021	.017	.212
Equipment (X_7)	.000	.000	.001***
farm size (ha) (X_8)	.341	.045	.000***
Fertilizer (X_9)	.000	.000	.058*
R^2 = 0.609			
Adj R^2= 0.576			
F- Value =18.6			

Source: Field Survey, 2021
***< 0.01-1%, ** 0.01-0.05= 5%*0.051-0.099=10%

3.4 Main Constraints Faced in the Vegetable Production by the Farmers

The perishable nature of vegetables creates storage and processing problems from the farm during harvesting to the point of sale. Table 4 showed the main constraints affecting vegetables farmers in the study area. Most of vegetable farmers had the challenges of pest and diseases and this was ranked as 91.7%, followed by inadequate capital (88.3%) and then by climate change (85.0%).

Table 4 Constraints to Vegetable Production

Constraint	Not a constraint		Mild constraint		Major constraint		Mean	Rank
	Freq	%	Freq	%	Freq	%		
Pest and disease	2	1.7	54	45	64	53.3	2.51	1st
Inadequate capital	9	7.5	56	46.7	55	45.8	2.38	2nd
Climate change	27	22.5	25	20.8	68	56.7	2.34	3rd
Selling in the market	24	20	34.2	38	58	48.3	2.28	4th
High cost of input	30	25	32	26.7	58	48.3	2.23	5th
Transportation to market	14	11.7	64	53.3	42	35	2.24	6th
Shortage of labor	39	32.5	28	23.3	53	44.2	2.12	7th

Source: Field Survey, 2021

The implication of the result is that the return from vegetable farming may not be enough to sustain production and likewise the climate variability or unpredicted weather affect the vegetable farmer negatively. Selling in the market (75.0%) affects famer, and this may be due to inability of the farmer to meet the targeted consumer or inability to access vegetable value chain processes. High cost of input (71.7%) affects vegetable farmer. Most of agricultural inputs are of

the high side most especially when the exchange rate is very high compare to dollar. Other factors that affect vegetable production are transportation to market (58.3%) due to poor road network and bad condition of the feeder roads as also noted by [1] in his study on transportation system among yam farmers in Ondo State, Nigeria. Also, open pick-up trucks have been identified to be the major mode of transportation employed by fruits and vegetable farmers in Nigeria [8]. Shortage of labour (46.7%) also affect vegetable production but it was not seen as a serious problem as the percentage is less than average. The farmers will have access to labour due to large family size.

4 Conclusion

The study has critically examined the performance and risk management in the production of vegetable. The high perishability and low in the productivity due to risk encountered by the farmers have called for this study. The study concluded that the lack of discriminating pricing system based on quality and grade of produce, conflict in policy making, and high cost of inputs affect the market prices and as well serve as the main production risk that observed by the farmers in the area. The vegetable enterprise was profitable despite high cost of labour in the area. It was concluded that farmers realized times six of their investment. This showed that vegetable production can yield tangible income to the farmers than any other food crops if properly managed and cultivated. The variables such as household size, farm size, fertilizer application and equipment should be given priority in determining the production vis-à-vis the profitability of vegetable in the area. Also, the challenges faced in terms of pests and diseases, inadequate funds and climate change consequences were reported by the farmers as hinderances to the maximum productivity in the area. Based on these findings, the vegetable farmers should be encouraged through technical training on innovative approach to price determination and forming of functioning market structure in the area. The high cost of labour incurred by the farmers should be addressed by the government by introducing technologies that could do most of the agronomic practices at a minimized cost. The problem of pests and diseases should be addressed by planting resistant varieties and the integrated pest management knowledge should be extend to the farmers through extension agents of the government. Government should also intensify the awareness and regular information on the climate variability so that the planting dates of the farmers can be regulated.

Recommendations

It could also be recommended that relevant facilities and scientific instruments such as weather forecasting devices will be of great help in choosing appropriate planting dates for the vegetable planting by the farmers in the area. They should be constituted into co- operative which will enable them to have access to loan/credit at a digit interest rate, while government should assist the farmers in subsiding the farm input for vegetable production. Government should provide incentive that would encourage young unemployed graduates into the enterprise as this will cause the expansion of production and supply of vegetable to market.

Compliance with ethical standards

Acknowledgments

The author sincerely appreciates the effort of Dr. A.I. Olutumise who assisted in proofreading and data analysis.

Statement of informed consent

Informed consent was obtained from all the vegetable farmers in Ogun state, Nigeria included in the study.

References

[1] Olutumise AI. Transportation System and Output Market Participation Nexus among Yam Producers in Southwest Region of Nigeria. Scientific Paper Series Management, Economic Engineering in Agriculture and Rural Development. Jan 2020; 20(4): 365 – 379.

[2] Idachaba FS. Food Policy in Nigeria.Agricultural Research Bulleting. 2000; 1: 162.

[3] IFPRI. Constraints to Increasing Agricultural Productivity in Nigeria. Washington D.C.: International Food Policy Research Institute. 2008.

[4] Joy PP. Benefits and Uses of Pineapple, Pineapple Research Station (Kerala Agricultural University), 2010, Vazhakulam-686 670, Muvattupuzha, Ernakulam, Kerala, India.

[5] Shing-Jy JT, Hsiao-Feng L. Handbook of Vegetable Preservation and Processing Edited by Y. H. Hui, Sue Ghazala, Dee M. Graham, K.D. Murrell, &Wai-Kit Nip CRC Press. 2003.

[6] Oseni JO, Olutumise AI, Olutumise BO. Performance Evaluation of Cocoa Marketing in Osun State, Nigeria. Journal of Perspectives on Financing and Regional Development. 2018; 6(1): 97 – 112.

[7] Oparinde LO, Olutumise AI. Impact of Credit Constraints on Aquaculture Production and Risk Exposure in Ondo State, Nigeria. Journal of Applied Aquaculture. 2020.

[8] Adetuyi FO, Osagie AU, Adekunle AT. Nutrient, antinutrient, mineral and zinc bioavailability of okra Abelmoschus esculentus (L) Moench Variety. Am. J. Food. Nutr. 2011; 1(2): 49.