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Economics of Dry Season Vegetable Production in Selected Urban Areas of Oyo State, Nigeria

Ogunwande, I.O. and Arifalo, S.F.
Department of Agricultural and Resource Economics, Federal University of Technology Akure, Ondo State

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Abstract

Vegetables play a significant role in supplying essential minerals, vitamins, and fibres, which are veritable sources of antibody supply. Vegetables are produced by farming households solely for consumption or commercial purposes for income generation, or both, and are cultivated under rain-fed or irrigation schemes. The survey was carried out to examine the economics of dry season vegetable production in selected urban towns in Oyo State, Nigeria. A multistage sampling procedure was used to select a total of 180 farmers from three notable cities using well-structured questionnaires and interview schedules conducted by trained enumerators. The analytical tools employed to achieve the stated objectives were Descriptive Statistics (DS), Gross Margin Analysis (GMA), Multiple Regression (MR), and Likert Scale Ratings (LSR). Socioeconomic results revealed the average age (45 years), household size (7 members), experience (18.8 years), and married status (85%) among the respondents. The average revenue for seasonal vegetable sales was ₦490,379.99, while the annual gross margin estimated per farmer was ₦296,940.99. Total vegetable yield was found to be significantly influenced by years of education (0.1359; $p<0.05$), quantity of fertilizer (0.0938; $p<0.10$), experience (0.3804; $p<0.01$), and number of extension contacts (0.1716; $p<0.01$) received during the planting season. Lack of credit facilities and perennial shortage of farm labour were the challenges deterring exotic vegetable production among the farmers. It is recommended that credit be made available to farmers at an affordable interest rate and that infrastructures be developed in rural areas to address the issue of labour shortage.

Introduction

Vegetable production is a growing aspect of agriculture in recent times and the awareness to consume vegetables for good health experiences an upward trend (Food and Agricultural Organization (FAO, 2009). Vegetable crops are grown in many parts of the world contributing significantly to income security and cater for the nutritive diet of many households. According to Mofeke *et al. (*2013), vegetable crops constitute 30% to 50% of iron and vitamin A in the regular diets of the consumers. Crops such as tomatoes, okra, pepper and cabbage among others are widely cultivated in most parts of Sub-Sahara Africa, and particularly by small scale farmers in most states of Nigeria (Adeolu and Taiwo 2009; Giroh *et al.,* 2010). Supply of vegetable does not keep pace with the demand, thus leaving a wide gap in consumers' need. This problem was frequently tackled by cultivating disease and pest-resistant vegetable varieties and other means of tackling the perennial problem. Vegetable production under protective structures, such as netting reduces yield losses from insects, diseases, heavy rains and sunburn which results in higher productivity and returns per unit area (Ramasamy, 2011). Protective structures provide protection to vegetable crops against biotic and abiotic stresses (Palada, 2011). Mangmang (2012) reported that the total fruit yield and high returns of tomato crop was significantly enhanced by the plastic net covers. The net shade greatly reduced insect population by 80% and marketable yields were 1.5 to 2 times greater

Corresponding author: Tel: +2348055935271
Email address ioogunwande@futa.edu.ng (I.O. Ogunwande)

under the controlled environment than in the open field (Palada and Ali, 2007). Growing cabbage under nets reduced insect incidence by 38-72 percent and resulted in significantly higher returns (Neave *et al.,* 2011).

The cultivation of improved varieties of vegetable for production sufficiency was achieved under the controlled or partially controlled environment resulting in higher yields than those that are under open conditions (Navale *et al*. 2013). Apart from the problem of the improved varieties of vegetable, water remains a limiting factor in perennial crop production in Nigeria, irrigation facilities are provided by the Nigerian government through the River Basin Development Authority (RBDA) throughout the federation which has the mandate of providing water for agricultural and other commercial purposes. However, irrigation farming is relatively low in Nigeria and Africa as a whole, with irrigated area estimated at only 6% of total cultivated area compared to 37% of Asia and 14% for Latin America (FAOSTAT, 2009), while Svendsen and Sangi (2009) observed that more than two-third of existing irrigated area is concentrated in five countries namely Egypt, Madagascar, Morocco, South Africa, and Sudan. Giving that irrigated crops yields are more than double of rain-fed yields in Africa (Liangzhi *et al.*, 2010), it is important to invest in irrigation developments with particular focus on locations and technologies with greatest potential for irrigation, which in turn results in expanded annual cultivation period. Notable varieties of leaf and fruit vegetables of exotic nature are available in Nigeria which are already adopted by farmers and supported heavily by irrigation and fertilizer to achieve an expected yield. Among these are tomatoes, cucumber, okra, watermelon, broccoli, bell pepper, spring onion to mention but a few.

Literature is awash with a lot of work on vegetable production but a few studies have been carried out on vegetable production in the dry season. Therefore, sound knowledge of vegetable production is expedient to be conversant with in the production of vegetable in the dry season of the year. The uniqueness of this study lies in the exotic varieties of vegetable being examined while many of the previous studies emphasized vegetable production generally. The following research questions are to be answered in the course of this work. What are the socioeconomic characteristics of the respondents? What are the commonly cultivated vegetable varieties cultivated in the study area? Is production of dry season vegetable profitable? What are the factors affecting dry season vegetable production? What are the perceived challenges confronting dry season vegetable production among farmers? The specific objectives are to describe the socioeconomic characteristics of vegetable farmers; to identify the commonly cultivated vegetable in the study area; to estimate profitability of vegetable; determine factors affecting vegetable production among the respondents and to examine perceived challenges in vegetable production among the farmers.

Materials and Methods

Study area

This study was carried out in Oyo state of Nigeria (Fig. 1). The capital is Ibadan. The dominant tribe in the state is Yoruba. It was created in 1991 from the old Oyo state. The state is located on longitudes 2^0 32'W and 4^0 08'E, and latitudes 7^0 34'N and 8^0 35'N. It is bounded in the North by Kwara state, bounded to the South by Ogun state, and bounded to the East and West by Osun and Ogun/Benin republic respectively. The state has a total land area of 27,249sq km and a population of 5,591,589 with 2,809,840 males and 2,781,749 females (National Popular Commission, 2006). It has thirty three (33) Local Government Areas, under these are many big towns and villages such as Ibadan, Ogbomoso, Oyo, Iseyin, Shaki, Okeho, Kishi among others whose populations engage in various non-agricultural activities (such as teaching, civil service, artisans, among others) and agricultural enterprises ranging from production, distribution to marketing/exchange. Oyo State is endowed with wide expanse of agricultural land, moderate average annual temperature and rainfall of $\pm 27^0$C and 1650mm respectively which enhances cultivation of different kinds of arable crops.

Source of data

Data used for the study were mainly from the primary source and this comprised the socioeconomic and input characteristics such as yield of vegetable, fertilizer, labour, years of farming experience, years of

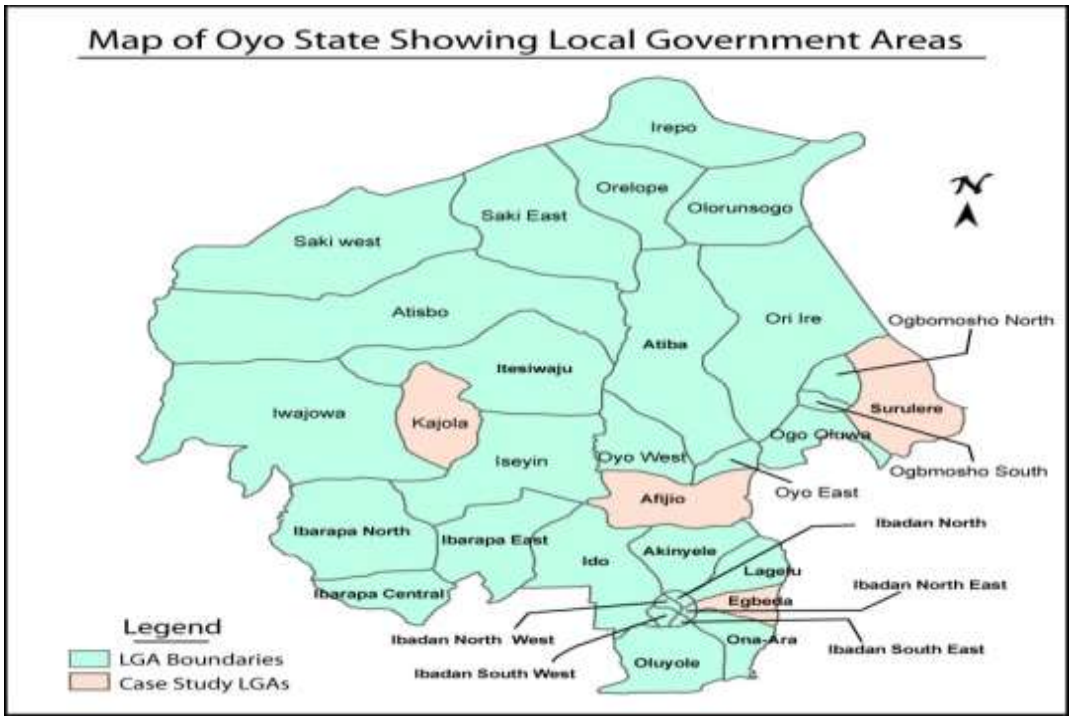

Fig. 1: Map of the Study Area

Source: Ministry of Information and Culture, Oyo State (Yearbook 2021).

education, seed and farm size, to mention but a few. The data were collected at the peak of dry season spanning four months December and April 2022.

Instruments of data collection

Copies of well-structured and pretested questionnaires were used to collect data used for the study. Trained enumerators were employed in the administration of the materials in order to fast track the process, enhance accuracy and ascertain unbiased responses.

Sampling technique

A multistage sampling procedure was used in the selection of the vegetable farmers used for the study. In the first sampling stage was the random selection of four blocks (i.e LGAs) each from each of the four existing zones. Random selection of four, one cell from each of the block making four cells formed the second sampling stage. In the third stage was the random selection of three communities from each of the cells forming 12 communities while 15 respondents were selected from each of the communities forming a total of 180 respondents and interviewed for the data collected. Sampling details are presented in Table 1.

Descriptive statistics

Descriptive statistics was employed in the analysis of the socioeconomic characteristics of dry season vegetable farmers. This comprised frequency counts, percentages and mean.

Gross margin analysis

The profitability of dry season exotic vegetable was estimated using Gross Margin Analysis (GMA). The use of this tool follows (Ahmadu and Oyoboh, 2017; Yisa *et al.*, 2017) who applied it to the estimation of profit realized in different farm enterprises. The tool is explicitly given as follows:

GM = TR –TVC

Where, GM = Gross Margin; TR = Total Revenue; TVC = Total Variable Cost

Profitability ratio

Net Profit is given as:

$\pi = TR - TC$

Where π = Profit; TR = Total Revenue; TC = Total Cost

Hence, Profitability ratio is calculated as follows:

Profitability ratio = π/TVC

When $\pi/TVC > 0$, enterprise is profitable

When $TVC < 0$, enterprise is non-profitable

Table 1: Detailed Design for Sampled Vegetable Farmers

State	Zone	Block	Cell	Community	Respondents
Oyo	Oyo	Afijio	Ilora	Ilu Aje	15
				Ilora	15
				Aribombo	15
	Ibadan/Ibarapa	Egbeda	Erunmu	Erunmu	15
				Owo Baale	15
				Kasumu/Ajia	15
	Saki	Irepo	Kishi	Mijemu	15
				Siseorowo	15
				Idi Apa	15
	Ogbomoso	Surulere	Iresa Adu	Iresa Adu	15
				Iresa Apa	15
				Iregba	15
Total					180

Source: Author's Concept, 2023.

Multiple Regression Model

This was used in finding the causal relationship between dependent and independent variables, which was used to determine factors affecting quantity of vegetable produced. Multiple regression is amenable to defining the influence of each and collective effects of independent variables on the dependent variable in combination with the diagnostic values such as t-value, f-value, adjusted coefficient of multiple determination (R^2) and coefficient of multiple determination (R^2). Multiple regression is explicitly stated following Olayemi (1998) and Damodar and Gujarati (2004) as:

$$Q = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \cdots + \beta_n X_n + e_i$$

Where,

β_s are vectors of parameters to be estimated and Xs are the variables stated to explain independent variables

Q = Quantity of vegetable produced (in Kg)

X_1= Farm size (in hectares)

X_2 = Quantity of seed (in kilogram)

X_3 = Quantity of herbicide (in litre)

was used. Selection of scoring of constraints followed Ademola *et al.* (2017).

The scores were calculated as follows:

Weighted score (WS) = 5n + 4n + 3n + 2n + 1n= Total score for each constraint

Mean Score (MS) = $\frac{Total\ score\ of\ each\ constraint}{total\ score\ of\ respondents}$

X_4 = Number of labour (in man-days)

X_5 = Quantity of fertilizer (in kilogram)

X_6 = Farming Experience (in years)

X_7 = Extension contacts (dummy, 1=yes; no=0.)

X_8 = Quantity of Water (in litres)

e_i = Disturbance term

Three functional forms; linear, exponential and Cob Douglas functional forms were tested on the data and the criteria for selection of the lead equation are:

(i) Sign of the coefficient;

(ii) Level of significance of the coefficient at any of 1%, 5% and 10%;

(iii) Magnitude of the t-value;

(iv) The magnitude of coefficient of multiple determination R^2 and adjusted R^2.

Likert Rating Scale

The five point likert scale was used to examine challenges encountered in vegetable production by farmers. Rating of response of strongly agree = 5, agree = 4, undecided = 3, disagree = 2, strongly disagree = 1 Rank = the values of the MS was used to rank the severity of the limitations faced by the respondents.

Results and Discussion

Socioeconomic characteristics of the respondents

Socioeconomic characteristics of the respondents are presented in Table 2. Result on age showed that the

farmers within the range of 21-40 years formed the highest with 62.2% while the average age of farmers were 45 years. This suggests that farmers in the cultivation of late season vegetable are economically active. This result agrees with (Akudugu *et al*. 2012; Nwaru, 2004) who supported that high farm production aligns with young age of farmers. The majority (70.6%) of vegetable farmers were found to be male which infers that the drudgery nature of farm work can be coped with by male farmers. Household size is in the average of 7members revealing that farmers have relatively large family in the study area that can be a good source of farm labour. This result is supported by Randela (2005) who submitted that large household size creates opportunity for farm labour, most especially in the on-season when they are mostly needed. Result of the married respondents stood at 68.9% while the least in the group was divorced with 5.0%. It could be inferred from this result that vegetable farmers placed a high premium on marital union which goes a long way in co-existence for procreation, interaction and resource gathering for greater and meaningful achievements. Educational level of the respondents revealed that 93.2% of the vegetable farmers are literate. We can infer from this result that farmers in the production of vegetable have a lot of opportunities in terms of efficient combination of inputs for maximum output given the fact that they will have more access to information about new technology that can lead to more yield. This outcome associates with the findings of Marther and Adelzadeh (1998) who states that education is capable of enhancing better information availability for improved output to farmers. Majority (78.9%) of vegetable farmers responded of their membership of cooperative society which is an avenue to relate socially and harnessing the opportunity of social capital for achievement of optimal investment in the farm work.

Respondents with farming as main occupation are 52.4% and this was followed by civil servants (26.7%) while group with occupation of least number of respondents was trading (7.0%). It could be inferred from this result that farmers have more time for growing vegetable without distraction for the fact that it is their primary engagement. Average monthly income of the vegetable farmers was ₦452, 359.00k while the highest of 48.3% was recorded for the income range of ₦200, 001-₦400, 000. It could be concluded from this result that farmers realize relatively good income which is at least about seven times more than the national minimum wage.

Commonly Cultivated Vegetables among Farmers

Commonly cultivated vegetables among farmers are presented in Table 3. Amaranthus (95.1%) was the most commonly cultivated by the respondents. The result suggests that preference for Amaranthus *spp* was overwhelming probably due to its palatability. Celosia (89.6%) was scored second as one of the vegetable varieties popularly planted in the area and the reason might be as a result of its medicinal value. Corchorus (76.4%) was ranked third among the commonly grown vegetables and the reason for this may be attributed to its cheapness during the period. Bitter leaf (74.2%) was rated fourth among the vegetables. The reason for this might be due to its medicinal advantage and ease of production. Ugwu (70.3%) was rated fifth according to the preference of the farmers. The main reason for the choice might be due to wide acceptance and medicinal advantage of the vegetable. Waterleaf (66.5%) was ranked sixth among the commonly vegetable cultivated among the respondents. The reason for its cultivation might be due to its succulent nature and high marketability value. Seventh on the table was spinach (61.5%) which is known to be commonly consumed by the residents in the study area and it commands a lot of revenue when marketed and the acceptance of it is due to its high palatability value. Tomato (60.6%) was ranked eighth among the array of vegetables grown based on it fruit nature. It is used as a major ingredient in the preparation of soup and based on this advantage commands larger acceptance and patronage in the area of production and other major cities within the environs. Also, some households use the leaf of tomato as cooked leafy vegetable. Invariably, tomato serves the dual purposes of leafy and fruit vegetable. Okra (58.9%) was ranked ninth but it also serves the purposes of using the leaf and the fruit for consumption and economic purposes. Both the okra and the leaf are useful for cooking and also have the advantage of being

Table 2: Socioeconomic Characteristics of the Vegetable Farmers

Variables	**Frequency**	**Percentage**	**Mean**
Age (in years)			
≤20	23	12.8	45 years
21–40	112	62.2	
21–60	25	13.9	
>60	20	11.1	
Gender			
Male	127	70.6	-
Female	53	29.4	
Household size (No.)			
≤6	35	19.4	7 members
7–10	111	61.7	
>10	34	18.9	
Marital status			
Single	37	20.6	-
Married	124	68.9	
Widowed	10	5.6	
Divorced	9	5.0	
Educational level			
No formal education	12	6.8	
Primary	28	15.7	
Secondary	54	30.2	
Tertiary	86	48.3	
Cooperative membership			
Yes	142	78.9	
No	38	21.1	
Primary occupation			
Farming	93	52.4	
Artisan	25	13.9	
Trading	14	7.8	
Civil servant	48	26.7	
Monthly income (in Naira)			
≤200,000	25	14.6	₦202,359.00
200,001–400,000	87	48.3	
400,001–600,000	19	10.6	
>600,000	49	27.2	
Total	**180**	**100.0**	

Source: Field Survey, 2023.

Table 3: Commonly Cultivated Vegetables among Farmers

S/N	Vegetable	Farmers	Percentage	Rank
1.	Ugwu (Elegede)	128	70.3	5th
2.	Waterleaf(Gure)	121	66.5	6th
3.	Spinach (Gbagba)	112	61.5	7th
4.	Bitterleaf (Ewuro)	135	74.2	4th
5.	Amaranthus(Efo tete)	173	95.1	1st
6.	Corchorus Olitorus (Ewedu)	139	76.4	3rd
7.	Celosia sp(Sokoyokoto)	163	89.6	2nd
8.	Okra (Ila)	106	58.9	9th
9.	Tomato	109	60.6	8th

****NB: Multiple Choice of Option Allowed.* Source: Field Survey, 2023.

processed into other products which van make it increase its shelf life for future marketing

Estimation of Profitability in Vegetable Production

An estimate of profitability of vegetable production in the dry season is presented in Table 4. The average total revenue (TR), total variable cost (TVC) and the total fixed cost (TFC) realized by farmers were ₦490, 379.99k, ₦220, 984 and ₦20, 300.00 respectively. Profit, profitability ratio and operating profit margin are in the respective of ₦249, 113.49, 1.03 and 50.8% respectively. It could be inferred from the results above that good financial performance was recorded by the vegetable farmers in the season under review going by the values presented above. The total revenue realized from the sale of tomato by the farmers creates expectation that the future of production is promising and the chance of higher returns on investment (ROI) in the future is guaranteed. With the financial status of the farmer, exotic varieties of tomato and the season of production encouraged more returns during the period when demand is more than supply **Factors affecting vegetable production among farmers**

Table 5 presents the regression estimates of determinants of vegetable production in the study area. Three functional forms were tested on the data and the lead equation was selected based on the magnitude of adjusted multiple coefficients of determination (Adjusted-R^2) which made Cobb Douglas the line of the best fit with 52%. This result suggests that 52% of variations in the dependent variable was jointly explained by the independent variable. The F-value (7.03; $p<0.01$) suggested that the model used was fit and appropriate.

Variables modeled such as farm size, herbicide, experience and water were positively significant while seed was found to be negatively significant according

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Table 4: Profitability of Dry Season Vegetable Production

Items	Amount(in Naira)	(%)
Total Revenue	490,379.99	100.0
Total variable cost (TVC)		
Transportation	31, 765.00	14.4
Seed	36, 517.00	16.5
Labour	29, 935.00	13.5
Fertilizer	20,762.50	9.4
Herbicide	35,227.50	15.9
Land preparation	37,637.50	16.8
Fuel	29,550.00	13.4
	220,984.50	100.0
Total Fixed Cost(TFC)		
Sprayer	5,450.00	26.8
Crude Implements	8.400.00	41.3
Land	6,450.00	31.7
	20,300.00	100.0
Fixed items were depreciated @10% using Straight Line Method		
Total Revenue (TR)	490,379.99	
Gross Margin (TR-TVC)	369,345.69	
TC= TFC +TVC	241,284.50	
π= TR-TC	249,113.49	
Profitability Ratio(π/TR)	1.03	
Operating profit margin(Operating profit/Gross sales)	50.8%	

Source: Field Survey, 2023

to a *priori* expectation. Farm size, herbicide, experience and water increased vegetable production while seed reduced the quantity of vegetable produced by farmers. A percentage increase in Farm size leads on the average to 55.80% increase in the quantity of vegetable produced by farmers. This result suggests that as increase in land area under the cultivation of vegetable in the study area will increase the production of the crop *ceteri paribus*. This result agrees with Branson and Norvell (1983) in their findings that farm size and farm output are directly related. A percentage increase in the quantity of herbicide used by the vegetable farmers lead on the average to 82.87% increase in quantity of vegetable produced. Therefore, with continual use of herbicide, there is an assurance that vegetable will increase proportionally if not more. Experience also counts in the output of vegetable among the farmers. A percentage increase in years of experience of farmers leads on the average to 7.03% increase in the quantity of vegetable produced; suggesting that with more water added to the farm in the off-season, more production will be recorded. Also, with an increase in the number of seasonal contacts, vegetable production will increase. A percentage increase in the quantity of water used in the production of vegetable by farmers leads on the average to 2.86% increase in the crop. With more water added to the farmland, production increased. Conversely, seed significantly reduced the quantity of vegetable produced among farmers. A percentage increase in the quantity of seed used by the farmers leads on the average to 93.48% decrease in the quantity of vegetable harvested during the season. Addition of more seed yields no significant vegetable output.

Perceived problems confronting vegetable production among the farmers

Table 6 presents the perceived challenges confronting homestead vegetable production in the study area. High cost of fertilizer (4.19) was scored first among the perceived problems confronting vegetable farmers. Fertilizer supplies the needed macro and trace nutrients needed by the crop and the need for this is essential since shifting cultivation is no longer feasible hence adoption of continuous cropping due to high population leading to restriction to expansion in farm area cultivated. Lack of access to credit facilities (3.98) was also identified as the second problem militating against vegetable cultivation. This result suggests that vegetable farmers find it difficult to acquire the needed amount of loan due to difficulty in the process, inability to meet up with the condition stipulated or unavailability of the loan. Poor pricing (3.93) of the product was scored third as a challenge militating against tomato production among farmers. From this result, the consumers are normally after getting utility at least cost which may work contrary to the target of vegetable farmers in getting enough revenue and profit that will keep them afloat in the business and encourage them to produce more. Akinbola (2021) submitted that poor pricing of vegetable results in low revenue which eventually leads to reduction in farmers' welfare. High cost of herbicide (3.91) was scored fourth among the problems facing vegetable farmers. This result suggests that the use of herbicide remains a substitute to the use of labour as this factor of production is no longer available due to rural-urban drift which leads to high labour charges which may be somewhat unaffordable. High rate of pilfering (3.67) was ranked fifth as a problem encountered by vegetable producers. Farms nowadays are visited by thieves at any time of the day to steal farm produce which if otherwise would have been sold by farmers for money to re-invest in the business. The sixth problem identified by the farmers is high incidence of pests and diseases (3.61). Some vegetable farms have been destroyed by diseases and pests that have reduce production of vegetable to unprofitable quantity and this may discourage production of the product over time. Scarcity of labour (3.38) was identified as the seventh problem hindering vegetable production among farm. The result suggests that labour who mobilize other factors of production are nowhere to be found nowadays. Most of the healthy and agile youth who could practice farming had left the rural areas for the urban for fast-income generating jobs, thus, making labour very expensive to come by in the rural areas.

Conclusion

From the findings in the foregoing, it could be concluded that dry season exotic vegetable production is very profitable and the return on investment is

Table 5: Ordinary least square regression estimate of determinants of vegetable production in the study area

Functional Form	Constant	Farm size	Seed	Herbicide	Labour	Fertilizer	Experience	Ext. Cont.	Water	R^2	Adj. R^2	F-value
Linear	4.6719	1.2460***	-1.9397	5.5074*	7.4739***	-1.2630	1.8163	6.8891	-0.1500	0.48	0.46	4.05***
	(0.31)	(5.27)	(-1.95)	(2.18)	(5.58)	(-0.25)	(1.15)	(0.45)	(-0.98)			
Exponential	6.7230***	0.2572**	-0.0181**	0.0481***	0.0024***	-0.0016	0.0014	0.0346	0.0001	0.23	0.20	3.69***
	(9.95)	(2.43)	(-2.12)	(2.67)	(3.50)	(-0.62)	(0.16)	(0.43)	(0.21)			
+Cobb Douglas	4.8290	0.5580***	-0.9348**	0.8287***	0.7037	-0.0669	0.0703***	0.0923	0.0286***	0.55	0.52	7.03***
	(1.57)	(3.13)	(-2.39)	(3.13)	(3.61)	(-0.19)	(4.38)	(0.34)	(4.11)			

Source: Field Survey, 2023. *+: indicates selected functional form;*

*Note: ***, ** & * represent significant levels @ 1%, 5% and 10% respectively*

Table 6: Perceived challenges confronting homestead exotic vegetable production

Perceptive Statement	SA	A	U	D	SD	SW	MS	Rank
Poor pricing	69(38.3)	57(31.7)	33(18.3)	16(8.9)	5(2.8)	709	3.93	3rd
Lack of access to credit.	90(50.0)	39(21.7)	20(11.1)	21(11.7)	10(5.6)	718	3.98	2nd
High cost of herbicide	64(35.6)	62(34.4)	33(18.3)	17(9.4)	4(2.2)	705	3.91	4th
High cost of fertilizer	87(48.3)	57(31.3)	23(12.8)	10(5.6)	3(1.7)	755	4.19	1st
Scarcity of labour	40(22.2)	50(27.8)	43(23.9)	32(17.8)	15(8.3)	608	3.38	7th
High rate of pilfering	51(28.3)	59(32.8)	38(21.1)	23(12.8)	9(5.0)	660	3.67	5th
High incidence of pests and diseases	49(27.2)	56(31.1)	41(22.8)	25(13.9)	9(5.0)	651	3.61	6th

Source: Field Survey, 2023

Note: SA: Strongly Agreed, A: Agreed, U: Undecided; D: Disagreed; Strongly Disagreed

economically viable despite the environmental problems militating against farmers' optimal performance. Farm size, herbicide, years experience and water influenced the quantity of dry season vegetable produced in the study area. It is therefore recommended that:

Efforts must be made and intensified by the government and other stakeholders in agriculture to provide credit facilities to the vegetable farmers towards assisting them in the procurement of sufficient input and in-turn, scaling-up production. Further to this, the basic productive inputs used by the vegetable farmers must be heavily subsidized in order for them to purchase enough for the production season. Moreover, as a matter of necessity, government should ensure provision of social, farm, physical and institutional infrastructures in the rural to stem the tide of rural-urban drift, hence availability of sufficient labour. Training should be organized for the farmers on the use of disease and pest resistant varieties of fruit and leafy vegetables so as to realize bumper harvest post-planting period

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