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Food Sustainability and Security, Aftermath of Vegetable Production in Ebonyi State, Nigeria

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Abstract

Vegetable crops are increasingly being acknowledged as a prerequisite for food sustainability, nutrition, and security. The study examined food sustainability and security, the aftermath of vegetable production in Ebonyi State, Nigeria. Primary data were collected using a set of structured questionnaires from 286 vegetable crop farmers sampled across the three zones of the state; Ebonyi North, Ebonyi South, and Ebonyi Central using a multi-stage sampling technique. Data were analyzed using descriptive statistical tools, net returns model, analysis of variance, and ordinary least squares multiple regression techniques. The result showed that the majority of the vegetable farmers were females, married, educated, experienced, and belonged to cooperative societies. Vegetables such as Fluted pumpkin, 5944.70kg, waterleaf, 5802.49kg, tomato, 4498.83kg, spinach, 5789.90kg, okra, 5634.71kg, green pepper, 4739.02kg, and okazi leaf, 5856.23kg, dominated the vegetable production in the state. High net revenue, of N275461.93, was obtained in Ebonyi North relative to Ebonyi South and Ebonyi Central. Analysis of variance (ANOVA) result showed that there are significant differences in net returns of vegetable crops across the three agricultural zones of the state. Age, gender, household size, education, farming experience, farm size, and extension contacts hugely influenced vegetable crop production in the state. Inadequate capital, 99.7%, land fragmentation, 99.3%, high cost of input materials, 98.6%, pests, and disease attacks, 98.0% and the problem of the storage facility, 98.3% were perceived as major production constraints influencing sustainable vegetable production in the state. The study recommended government full support to intensify vegetable crop production in the state due to its economic viability. This would guarantee adequate food sustainability and security in the state.

Keywords: Food sustainability; Food security; Vegetable production; Ebonyi state; Nigeria.

1. Introduction

Food is the most basic and necessary need in existence and it must be met before any other rising need [1]. Its significance cannot be undermined because it is a basic source of nourishment, and proper food consumption, both in amount and quality, is essential for a healthy and productive existence [2]. The importance of food is further demonstrated by the fact that it makes for a sizable portion of the average Nigerian household budget. Food security is primarily concerned with food availability and, to a lesser extent, price stability of fundamental food items on an international and national scale [3]. Food security is inextricably linked to food sustainability. Its significance in human development is generally acknowledged [4]. Food security is a dynamic concept that has evolved over time in many dimensions, viewpoints, and scales, as evidenced by various definitions [5]. It is stated to exist when all people have physical and economic access to enough, safe, and nutritious food to suit their dietary needs and food preferences for an active and healthy life at all times [6]. Globally, it is known that food insecurity affects both developed and developing nations, although to varied degrees, as demonstrated by the condition of deprivation, hunger, famine, and poverty displayed by the status of individuals or groups of people living in a region [7]. The decline in food security, which has prompted discussions from various perspectives, attests to the complex ramifications of failing to adequately meet the nutritional demands and needs of the citizens, which might be disastrous if nothing is done strategically [8]. Commitment to food sustainability in Nigeria is one of the primary measures for eradicating poverty throughout the country. To eliminate hunger and famine, food systems, production, and sustainability must be improved. Food sustainability, on the other hand, might be achieved by guaranteeing enough food supply, accessibility, affordability, stability, and usefulness [9]. To begin with, food must be provided in adequate quantities on a continuous and constant basis. This relates to stockpiles and production in a certain location, as well as the ability to import food from elsewhere. It further denotes self-sufficiency in a home, a community, and the country as a whole [10]. Secondly, individuals must be able to obtain food on a regular basis, whether through home and local production or imports. Food access denotes the availability of adequate means to get healthy food without relying on emergency assistance or other coping mechanisms [11]. Food accessibility also refers to the processes of sharing food within the home. As a result, household food access refers to the capacity to receive enough food of assured quality and quantity to fulfill the nutritional needs of all family members. Food should be available and accessible at the correct time and in the right place, and individuals should have the economic freedom or purchasing power to purchase enough and healthy food. Affordability implies that food must be affordable at all times, and that people should be able to buy basic meals in acceptable quality and quantity regardless of economic downturns or shocks [12]. Affordability necessitates that each household acquire their food needs on a consistent basis. It must be affordable to every human being or family in order to meet their consumption demands. Food stability ensures basic foods to be stable and not to fluctuate; it refers to the ability to obtain food over time. Food stability calls for economic sustainability and efficient production systems. That is food must be secured and adequately available at all times [12]. Food stability comprises the overall food supply chain such as availability, accessibility, affordability and utility. Lastly, there must be absolute utilization of available food, which includes good storage, processing, preservation, cooking, and consumption, that is, food must be efficiently utilized by all means without waste [13].

Vegetables are plant portions used as food by humans and animals [14]. Vegetables are extremely essential in nutrition and health since they stimulate digestion; serve as laxatives or diuretics [15]. Vegetables, which may be consumed raw or cooked, serve a vital part in human nutrition since they are low in fat and carbohydrate while being high in vitamins, minerals, and dietary fiber [16]. Vegetables are increasingly being acknowledged as vital to food and nutrition security. Vegetable cultivation offers a promising economic opportunity for developing nations to reduce rural poverty and unemployment, and functions as an important component of agricultural diversification initiatives [17]. The growth of industrial uses for vegetables will encourage large-scale crop production and engender

greater diversity of rural entrepreneurial abilities [18]. Huge quantities of vegetables are grown in Nigeria each year to meet the nutritional and dietary needs of the country's expanding population and in support of food security. China was the world's greatest vegetable producer in 2010, followed by India, the United States, Turkey, Iran, and Egypt [11]. Nigeria committed 1844 hectares of land to vegetable agriculture in the same year, yielding 11830 tons [19]. In 2018, vegetable production in Nigeria was predicted to be 7.5 million tons [6]. It increased significantly to 16.7 million tons in 2019 at a 20.77 percent annual rate, and then fell to 3.81 percent in 2020 as a result of various variable factors [20]. Thus, annual production of vegetables in different parts in Nigeria has been staggering due to changing weather conditions (climate change) which has devastated vegetable production in the state. Other associated threats to food sustainability and security include; storage and processing facilities, inconsistent government policies, gender inequality, poor extension services, crude agricultural practices, poverty, illiteracy, population increase, corruption, political instability, extreme weather conditions, pests and diseases, and environmental issues such as erosion, flood, drought, desertification etc, [13, 21]. These factors impacts negatively on crop production thereby leading to food reduction, insecurity and hike in food prices [22]. It is on this backdrop that the study sought to evaluate food sustainability and security, aftermath of vegetable production in Ebonyi State Nigeria, which before now has not, been documented or profiled. The study is of great significance and timely in ascertaining the economic viability and profitability of vegetable crop production in achieving food sustainability and security in Nigeria.

Table-1. Vegetable production in Nigeria

Country	Hectare of Land	Metric Tons Produced	Year
Nigeria	1844	11830	2010
	-	7.5	2018
	-	16.7	2019

FAO [11]

2. Materials and Methods

The study was carried out in Ebonyi State, Nigeria noted to be one of the most agrarian states in Southeast, Nigeria. The choice of Ebonyi State was due to its intensive vegetable cultivation. Multi-stage sampling technique was used for sample selection. Three local government areas (LGA's) were purposively drawn from each of the structural zones of the state; (Ebonyi North, Ebonyi South and Ebonyi Central) making nine LGA's. Three communities were randomly selected from the LGA's making a total of 27 communities. Four villages were randomly picked from the selected communities giving 108 villages. Finally, 3 vegetable growers were randomly selected giving a total of 324 growers. Drafted questionnaire were administered and only 286 completed questionnaire were returned and used for data analysis. Data were analyzed using descriptive statistical tools, net returns model, analysis of variance, and ordinary least squares multiple regression technique. Ordinary least squares multiple regression technique on socio-economic factors influencing vegetable crop production was expressed as follows;

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9) + e \quad \text{eqn. (1)}$$

Where

Y = Output (kg),
X_1 = Gender (male 1, female 0),
X_2 = Age (years),
X_3 = Marital status (married 1, single 0),
X_4 = Education (years),
X_5 = Farming experience (years),
X_6 = Household size (No. of persons),
X_7 = Extension contacts (No. of contacts),
X_8 = Cooperative membership (yes 1, no 0),
X_9 = Farm size (ha), and
e = error term

The resultant net incomes in the three zones were tested for significant difference using analysis of variance (ANOVA) techniques; specified below:

$$F = \frac{MSSB}{MSSW} = \frac{SSB/(n-k)}{SSW/(k-1)} \quad \text{eqn. (2)}$$

$$SSB = \sum_{J=1}^{k} nj\,(X - X)^2 \quad \text{eqn. (3)}$$

$$SSW = \sum_{I=1}^{nj} \sum_{J=1}^{k} (Xij - X) \quad \text{eqn. (4)}$$

$$SST = SSB + SSW \quad \text{eqn. (5)}$$

Where:
F = Value of which the statistical significance of the mean difference will be judged,
SSB = Sum of square deviations between the net returns of vegetable crop production in the three zones,
SSW = Sum of squares deviations within the mean net returns of vegetable crop production in the three zones,
SST = Total sum of squares of the net returns of vegetable crop production in the three zones,
$\underline{Xj}$ = Mean level of net returns of vegetable crop production from zone J,
X = Grand mean level of net returns of vegetable crop production,
Xij = ith level of net returns of vegetable crop production from zone J,
nj = Sample size of farmers from zone J,
n = Number of observations in the three zones,
k-1 = Degrees of freedom for between samples,
n-k = Degrees of freedom for within samples,
k = Number of zones in the State, and
X = Net income from vegetable crop production
The net returns model is generally specified as follows:

NR = TR – TC ----- eqn. (6)

Where:
NR = Net returns (in Naira),
TR = Total Revenue (in Naira),
TC = Total Cost (TVC +TFC) (in Naira),
TVC = Total variable cost, and
TFC = Total fixed cost

3. Results and Discussion

3.1. Socio-Economic Characteristics of the Vegetable Farmers

The majority of vegetable growers, 62.6% were females as shown in Table 2. This implies that the female farmers dominated the vegetable crop production in the state more than their male counterparts. This is true because the cultivation of vegetables is usually associated with the women folks [15]. The majority of the vegetable growers, 50.3% were within their productive ages. This implies that the vegetable farmers were not old but young, active and strong enough to carry out their production activities and/ or operations. Married growers, 75.9%, dominated vegetable cultivation. This implies that the vegetable crop farmers were matured, responsible and committed to their occupation. The majority of vegetable growers, 86.4% were relatively educated and experienced in vegetable cultivation, which showed in their various outputs. Education enhances farmer's ability to understand production techniques, which enhances yields/outputs [22]. More so, years of farming experience strengthens farmers in overcoming inherent farm and production challenges as well as position them for better performance. The vegetable growers, 67.8% had relatively large households, which were evenly utilized in vegetable production. Large households' size is majorly source of farm labour and contributes extensively to greater outputs. The minority of vegetable growers, 34.3% had contacts with extension agents; this implies low visitations of the extension agents to vegetable farmers in the state. Extension services are notable production mechanisms deployed to assist farmers enhance their production capacities without much difficulties [13]. Majority of vegetable growers, 77.6% belongs to cooperative societies and this has a way of enhancing vegetable crop production. Cooperative societies are agents of agricultural production transformations known to assist her members with firsthand information and subsidized farming inputs such as capital, improved seedlings, agro-chemicals, labour, etc. Majority of the vegetable growers, 70.9% cultivated small portions of farmlands which were less than 2 hectares going by the mean farm size, this was attributed to land scarcity, tenure systems, land divisions and fragmentations [20].

Table-2. Socio-economic characteristics of vegetable growers

Socio-Economic Factors	Frequency	Percent
Gender		
Male	107	37.4
Female	179	62.6
Age		
21-30	6	2.1
31-40	126	44.1
41-50	144	50.3
51-60	10	3.5
Mean age	47	
Marital Status		
Single	26	9.1
Married	217	75.9
Separated/Divorced	14	4.9
Widow/Widower	29	10.1
Education		

Primary	101	35.3
Secondary	135	47.2
University	12	4.2
None	38	13.3
Farming Experience		
1-10	99	34.6
11-20	112	39.2
21-30	73	25.5
31-40	2	0.7
41-50	-	-
Mean farming experience	19	
Household size		
1-4	92	32.2
5-9	194	67.8
10-14	-	-
Mean household size	7	
Extension contacts		
Yes	98	34.3
No	188	65.7
Cooperative membership		
Yes	222	77.6
No	64	22.4
Farm size		
0.1-1.0	70	24.5
1.1-2.0	203	70.9
2.1-3.0	13	4.5
Mean farm size	1.8	

Source: Field Data, (2021)

3.2. Descriptive Statistics of Different Outputs of Vegetables Produced

The descriptive statistics of different output of vegetable crops produced was shown in Table 3. The Table showed that the vegetable growers produced various types' of vegetables ranging from fluted pumpkin to mushrooms production. Vegetable crops such as fluted pumpkin, 5944.70kg, water leaf, 5802.49kg, tomato, 4498.83kg, spinach, 5789.90kg, okra, 5634.71kg, green pepper, 4739.02kg, and okazi leaf, 5856.23kg were hugely cultivated by the majority of the vegetable growers and these vegetable crops evidently dominated the vegetable crop production in the state with higher mean outputs relative to other cultivated vegetables in the state. The dominance and cultivation of these vegetables was attributed to their higher demands, nutritional compositions and higher concentration of the vegetable farmers on these crops relative to other vegetables produced in the state. Furthermore, the high standard deviations associated with these vegetables further reflected and indicated their dominance and higher concentrations in the state.

Table-3. Descriptive statistics of different outputs of vegetables produced

Vegetables	No. of Farmers F %	Unit	Mean Output	Standard Deviation	Minimum Output	Maximum Output
Fluted pumpkin	285 99.9	Kg	5944.70	89.6778	350.00	6000.00
Water leaf	282 98.6	Kg	5802.49	87.9631	250.00	5900.00
Cucumber	101 35.3	Kg	2821.01	23.9640	170.00	3100.00
Tomato	209 73.1	Kg	4498.83	78.9031	300.00	4550.00
Cabbage	90 31.5	Kg	1102.48	55.0934	100.00	1700.00
Watermelon	196 68.5	Kg	2342.67	79.0974	230.00	3050.00
Lettuce	78 27.3	Kg	1110.21	51.8937	120.00	1600.00
Spinach (Green leaf)	274 95.8	Kg	5789.90	83.8947	250.00	5800.00
Okra	271 94.7	Kg	5634.71	78.8784	200.00	5700.00
Garden egg	189 66.1	Kg	2092.46	46.9474	117.00	3970.00
Green pepper	207 72.4	Kg	4739.02	79.9475	100.00	4969.00
Carrot	31 10.8	Kg	990.41	34.8354	90.00	1700.00
Eggplant leaf	189 65.0	Kg	3913.39	66.9887	230.00	4059.00
Onion	21 7.3	Kg	1016.67	37.9640	200.00	2500.00
Bitter leaf	170 59.4	Kg	2882.97	49.0923	170.00	3900.00
Scent leaf	169 59.1	Kg	2945.95	88.9462	100.00	3780.00
Okazi leaf	206 72.0	Kg	5856.23	81.7343	230.00	5990.00
Amaranthus	176 61.5	Kg	1936.49	56.9452	220.00	2900.00
Uziza leaf	108 37.8	Kg	2834.90	62.9330	270.00	3950.00
Mushrooms	166 58.0	Kg	3890.54	56.9052	240.00	4750.97

Source: Field Data, (2021)

3.3. Estimated Net Returns of Vegetable Crop Farmers Across the Three Agricultural Zones

The net returns of vegetable crop farmers across the three agricultural zones were shown in Table 4 below. The Table revealed that Ebonyi Central incurred the highest cost, N49916.07; on fertilizer application relative to other two zones. This implies that farmers in a bid to maximize outputs apply more of organic and inorganic fertilizers. Fertilizers are applied to improve the fertility of the soil which in turn improves output. This invariably could be the reason for the high cost of fertilizer recorded in Ebonyi central. A mean cost of N52452.65 was incurred on planting materials in Ebonyi South, while Ebonyi North and Ebonyi Central recorded a relative mean cost of N48411.85 and N48112.95 respectively. The high cost of planting materials in Ebonyi South depicted that more vegetable seedlings were planted in the zone. Low labour cost of N27061.19 was estimated for Ebonyi North, which was relatively lesser in comparison with other zones. This could be as a result of the use of family labour due to the high cost of hired laborers in the area. Family labour is a very vital source of labour which cannot be undermined as it provides the required manpower when efficiently utilized. Ebonyi Central has a percentage increase of 113% on the use of agrochemicals over Ebonyi South and 157% increase over Ebonyi North. The essence of the agrochemicals was to mitigate the intense attacks of pests and diseases on vegetable crops. Pests and diseases are notable enemies of vegetable crops and as such lowers yield if unchecked. A high transportation cost of N28351.92 was recorded in Ebonyi Central which was relative in comparison with other zones. Again, Ebonyi Central recorded the highest total variable cost and this implies that more variable inputs were utilized in the zone as against the other two zones. Total fixed cost was also estimated with Ebonyi Central having the highest value N79880.18. This indicates that Ebonyi Central were really into vegetable crop production. Consequently high net revenue of N275461.93 was recorded in Ebonyi North relative to other two agricultural zones, which imply that farmers in the zone were able to maximize outputs given the level of resources at their disposal and this reflected in the total cost obtained from the zone. The outstanding performance of the farmers in Ebonyi North was also evidenced in their rate of returns; 1.23, which implies that for every N1 invested in the vegetable production, a corresponding increase of 123%, is expected. The overall results has serious linkage and implications for food sustainability and security in Nigeria, as this detailed empirical evidence serves as a road map and/ or blue prints for food sustainability and security in Ebonyi State, Nigeria. It should be noted that if vegetable crop production is driven in other states of the federation in Nigeria, food instability, shortage and insecurity in terms of vegetable production would be drastically reduced and food sustainability and security attained.

Table-4. Estimated net returns of vegetable crop production across the three zones

Item Description		**Value N/Ha**	
A. Variable Cost	**Ebonyi North**	**Ebonyi South**	**Ebonyi Central**
Fertilizer	45456.34	35052.44	49916.07
Planting materials	48411.85	52452.65	48112.95
Cost of labour	27061.19	37862.49	30177.89
Agrochemicals	7351.01	10202.51	11556.09
Transportation	25647.42	27391.42	28351.92
Total Variable Cost	**153927.81**	**162961.51**	**168114.92**
B. Fixed Cost			
Depreciation of fixed items	4683.66	3763.65	4893.67
Rent on land	45901.45	47402.45	56442.75
Interest on loans	19477.06	25490.16	18543.76
Total Fixed Cost	**70062.17**	**76656.26**	**79880.18**
Total Costs	**223989.97**	**239617.88**	**247995.10**
Total Revenue	**499451.90**	**505259.28**	**455488.10**
Net Revenue	**275461.93**	**265641.40**	**207492.99**
Rate of Return	**1.23**	**1.11**	**0.84**

Source: Field Data, (2021)

3.4. Analysis of Variance: Test of Significant Differences in Net Returns of Vegetable Crop Production across the Three Zones of the State

The results in Table 5; showed that the ANOVA model produced Fcal value of 4.83 which was significant at 1% when compared with the Ftab value of 2.07, which implies that there are significant differences in net returns of vegetable crops produced across the three agricultural zones of the State. It could be further stated that the net returns of the vegetable crop production across the three zones of the state are statistically unequal. The result was further validated by Table 3 above. Therefore, the hypothesis, which states that there are significant differences in net returns of vegetable crop production of farmers, was accepted.

Table-5. Results of analysis of variance for test of significant differences in net returns of vegetable crop production across the three zones of the state

Sources of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	Fcal	Ftab
Between Groups	867430712	2	6064025	4.83	2.07
Within Groups	639698923	284	5456951		
Total		**286**			

Source: Anova results, (2021).
Fcal; Significant @ 1% level

3.5. Socio-Economic Factors Influencing Vegetable Crop Production

Table 6 showed the socio-economic factors influencing vegetable crop production in the state. Double-log functional form provided the best fit and was chosen as the lead equation because it had the highest value of the coefficient of multiple determinations (R^2), highest number of significant variables, and F-value respectively. The R^2 of 0.800 showed that 80% of the total variations in the endogenous variable were explained by socio-economic factors. The fitness of model was indicated by the F-value. The coefficient of age was positive, and significant, implying that increase in age of the vegetable growers increases vegetable outputs. This is true because as farmers advance in age, their farming potentials increase leading to increase output and productivity [13]. Gender was negative, and significant, implying that the female farmers dominated the vegetable cultivation. This statement corresponds with Table 1, which indicated that vegetable cultivation had more of female farmers and less of males. Household size was positive, and significant, implying that increase in household size of the vegetable growers increases vegetable outputs. Large household sizes are vital sources of labour which could be efficiently utilized in farm production [11]. The coefficient of farm size was positive, and significant, implying that increase in farm size of the vegetable growers will result in a corresponding increase in vegetable outputs. This is equally true since increase output has a direct relationship with the size of the farm [18]. Education was positive, and significant, that implying that a 1% increase in education of the vegetable growers will result in 1% increase in vegetable outputs. Thus, the acquisition of basic education helps farmers in understanding farm production principles and enhances their capacity for increased farm production [11]. Farming experience was positive, and significant, implying that any increase in farming experience of the vegetable growers will result in increase in vegetable outputs. Accumulative years of farm experience empower farmers to overcome inherent farming pressures and extreme weather conditions occasioned by climate change and other environmental factors [19]. Extension contacts were positive, and significant, implying that any increase in extension contacts of the crop farmers will increase vegetable crop production by 265%. Extension contacts is known to induce practical field knowledge and on hands farming innovations targeted in improving the productivity and income of crop farmers [13].

Table-6. Socio-economic factors influencing vegetable crop production

Variable	Linear	Semi-log	Double-log	Exponential
Constant	201.062 (1.104)	3.2352 (4.201)***	32.0402 (2.322)**	5.4022 (2.721)**
Age (X_1)	4.2351 (3.424)***	3.0251 (1.512)*	6303.1 (2.437)**	1.3271 (0.349)
Gender (X_2)	-524.333 (-1.403)	-6.4039 (-0.941)	-542.31 (-3.360)***	-4.4775 (-1.477)
Household size (X_3)	313.312 (1.211)	4.2066 (0.111)	3365.0 (3.739)***	4.1355 (1.007)
Farm size (X_4)	3001.10 (4.339)***	4.2345 (2.419)**	6244.32 (4.603)***	4.0025 (4.024)***
Education (X_5)	340.356 (1.020)	4.9320 (1.223)	5029.9 (3.211)***	1.5219 (2.934)***
Experience (X_6)	522.202 (1.132)	0.6515 (4.104)***	3442.1 (2.360)**	4.5502 (1.030)
Marital status (X_7)	612.06 (1.539)*	2.4291 (1.315)	270.212 (0.331)	2.4405 (1.445)
Membership in cooperative (X_8)	4013.1 (1.121)	4.2546 (1.304)	3.4652 (1.043)	4.2218 (2.039)**
Extension contact (X_9) R^2	68.195 (1.321) 0.889	14.333 (1.373) 0.608	2.6542 (1.510)* 0.800	6.4401 (1.331) 0.701
F- ratio	12.07***	17.18***	34.13***	23.41***

Source: Field Data, (2021)
***, **, * significant at 1%, 5%, 10%

3.6. Perceived Constraints Influencing Sustainable Vegetable Crop Production

Perceived constraints influencing sustainable vegetable production was shown in Table 7. The Table indicated that the vegetable crop farmers complained of inadequate capital, 99.7%, land fragmentation, 99.3%, high cost of input materials, 98.6%, pests and disease attacks, 98.0% and problem of storage facility, 98.3% as their major production constraints influencing sustainable vegetable production in the state. Other includes, inadequate information concerning climate change, 69.6%, high cost of transportation, 56.7%, inadequate farming lands, 53.1%, poor extension access and services, 36.7% and high cost and low availability of labor supply, 54.5%. Put together, all these factors influenced hugely sustainable vegetable crop production in the state and thus, should be looked into by relevant agriculture stakeholders in the state to ensure a reversal of these constraints and increase the performance of the vegetable farmers via increase in productivity and net revenues.

Table-7. Perceived vegetable production constraints

Perceived Constraints	Frequency	Percent
High cost of transportation	162	56.7
High cost and low availability of labor supply	156	54.5
Inadequate farming lands	152	53.1
Poor extension access and services	105	36.7
Land fragmentation	284	99.3
Problem of storage facility	281	98.3
Inadequate capital	285	99.7
Inadequate information concerning climate change	199	69.6
Pests and disease attacks	280	98.0
High cost of inputs materials	282	98.6

Source: Field Data, (2021)

4. Conclusion and Recommendations

Conclusively, to ensure and promote efficient food sustainability and security in the state and her counterparts, vegetable crop production should be adequately sustained and encouraged by all relevant agriculture stakeholders across the length and breadth of the state, this is on the basis of its economic viability, productivity and profitability considering the high net revenues estimated across the entire agricultural zones of the state. This will trigger continuous food supply and food availability all round year thereby conquering food shortages and re-position our dear country and her states to attain global food sustainability and security at all times without compromise. However, it should be noted that farmers in the various zones efficiently maximized outputs given the level of available resources (inputs) at their disposals. This equally shows a high level of economic and technical efficiency attained by the vegetable crop farmers in the zone and thus, should be encouraged for more productivity and efficiency. The study strongly recommends the intensification of vegetable crop production in the state and other states in Nigeria due to its profitability, productivity, sustainability and economic viability. Subsidized agricultural inputs and soft loans should be granted to vegetable farmers with low or no interest attached. More so, other perceived constraint that negates vegetable crop production in the state should be efficiently addressed without fail.

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