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ARAŞTIRMA MAKALESİ **RESEARCH ARTICLE**

Effects of vegetable production on income and livelihood of rural households in Nigeria

Nijerya'da sebze üretiminin kırsal hanelerin gelir ve geçim kaynakları üzerindeki etkileri

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Ö Z E T / A B S T R A C T

Aims: The growing level of food insecurity and poverty in developing nations, especially among rural households, requires more effort and measures to curb it. Engaging in vegetable production by rural households can play a significant role in alleviating poverty, improving their nutritional status and livelihood. This study, therefore, investigates the effect of vegetable production on rural farmers' income and households' livelihood in Nigeria.

Methods and Results: Data collected from 400 vegetable farming households were analysed using descriptive statistics and multiple regression. The results revealed that vegetable farming is a female-dominated venture (89.4% females). The regression results revealed that vegetable output had a positive and significant effect on rural households' income. Other factors that influenced farmers' income were household size, access to credit and farm size. Furthermore, vegetable production had positive effects on rural households' livelihood by providing employment, income, basic needs, food, paying for school fees, improving their nutritional status and standard of living. Pests and diseases, poor storage facilities, post-harvest loss, inadequate credit facilities, high cost of inputs, poor knowledge of irrigation, poor transportation and poor extension services were the severe constraints faced in vegetable production.

Conclusions: It can be inferred that vegetable production contributed immensely to rural households' economic status, livelihood and wellbeing. Although, the venture was faced with some challenges. Therefore, the provision of accessible and affordable credit facilities by banks, government and non-governmental organizations to the farmers is important as this would encourage them, curb most of the constraints and increase their income.

Significance and Impact of the Study: Understanding the effects of vegetable production on the income and livelihoods of rural dwellers will enhance participation. Therefore, the outcome of this study would allow policymakers to intervene in its production in view to lower poverty and malnutrition, and improve rural households' wellbeing.

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INTRODUCTION

The realization of the potential of vegetable production in meeting up with the necessities of life has made farmers embark on its production, not just for immediate consumption, but also for sale to improve their livelihood and wellbeing (Asadu et al., 2018). Thus, vegetable production can be targeted towards poverty alleviation, nutrition and food security programs in developing nations due to its numerous importance. It increases farmers' access to cash for necessities of life and promotes farm operation. These make the production of vegetables go beyond backyard production for household consumption to large-scale levels for national and international markets (Heinemann, 2002). It provides more employment per hectare of land, off-farm and on-farm than other agricultural ventures (FAO, 2020). Vegetables do not serve as means of livelihood to farmers alone but to many intermediaries such as wholesalers, retailers and farm agents who are involved in its value chain and responsible for its movement from the farmers to the consumers. Thus, vegetable production has a great tendency to curb the problem of malnutrition and the high poverty rate among rural people (Imathiu, 2021; Schreinemachers et al., 2018).

Vegetable farming has been ongoing for decades in Nigeria, contributing to income and serving as means of employment for the growing population, especially dry season vegetable farming (Mukaila et al., 2021; Sabo and Zira, 2009). Nigerian vegetable output in 2020 was 15.7 million tonnes (Knoema, 2021). This immensely increased from what the country produced (3.11 million tonnes) in 1970 (Knoema, 2021). Vegetables are easily grown, require little production input, rich in minerals and vitamins, have an anti-oxidant property and contain phytochemicals. Apart from the economic importance of vegetable crops, they form part of the daily human diet globally, supplying the body with nutrients necessary for a healthy life (Ngegba et al., 2016). Due to its high nutritional components and health benefits, a minimum of 400g consumption per day in conjunction with fruits is recommended (FAO, 2020).

Globally, the need to reduce the high poverty rate and food insecurity, especially in the rural areas of Sub-Saharan Africa continues to gain much attention among researchers and policymakers (Mukaila et al., 2020; Mukaila et al., 2021a). Globally, up to 811 million people are hungry (FAO, IFAD, UNICEF, WFP & WHO, 2021). Food insecurity and undernourishment keep increasing in Africa as more than 250 million people are undernourished out of which Sub-Sahara Africa alone harbours 239.1 million people (FAO, IFAD, UNICEF, WFP & WHO, 2020). Nigeria is not excluded as 57.7% of the population were food insecure (FAO, IFAD, UNICEF, WFP & WHO, 2021). Also, the developing countries harbour more than 80% of the global extremely poor people (De La O Campos et al., 2018). Over 50% of Africa's population were extremely poor (World Bank, 2019). The poverty level in Sub-Sahara Africa is on the high side as the region harbours over 56% of the global extreme poor people (Beegle & Christiaensen, 2019; World Bank Group, 2018). Nigeria is not immune to this menace as 40.1% (Over 85 million people) of its population were poor (National Bureau of Statistics, 2020). Engaging in vegetable production can play a significant role in alleviating poverty, ensuring food security, improving nutritional status and livelihood.

Despite vegetable production potentials, previous studies on vegetables focused on their profitability, efficiency and marketing (Isitor et al., 2016; Ngegba et al., 2016; Schreinemachers et al., 2016; Timsina and Shivakoti, 2018; Tsiboe et al., 2019; Mukaila et al., 2021) without investigating its contribution to household income and livelihood. There is thus a need to examine if vegetable production has improved the income, livelihood and wellbeing of rural people. This is important as it would allow policymakers to intervene in its production in view to improving rural households' wellbeing. Because of this, this study was aimed to fill the research gap by assessing the effect of vegetable production on rural households' income and livelihood. Specifically, the present study: described the vegetable farmers' socioeconomic characteristics; identified the determinants of vegetable farmers' income; investigated the effect of vegetable production on farming households' livelihood and identified the constraints faced in vegetable farming.

MATERIALS and METHODS

Study area

The study was carried out in Nigeria. Agriculture is a major means of livelihood, especially the rural areas. The country has a landmass of 923,769 square kilometres (Mukaila, 2021; World Bank, 2019). Oyo and Kwara State are among the states widely involved in agricultural activities. Oyo State is an inland state, with an approximate land mass of 28,454 km^2, located in the Southwestern part of the country. Kwara state is located in the northcentral part of the country with an approximate land area of 36,825 km^2. Crops such as maize, rice, cassava, cowpea, yam, sorghum, groundnut, sweet potatoes, wheat, beans and vegetables are widely

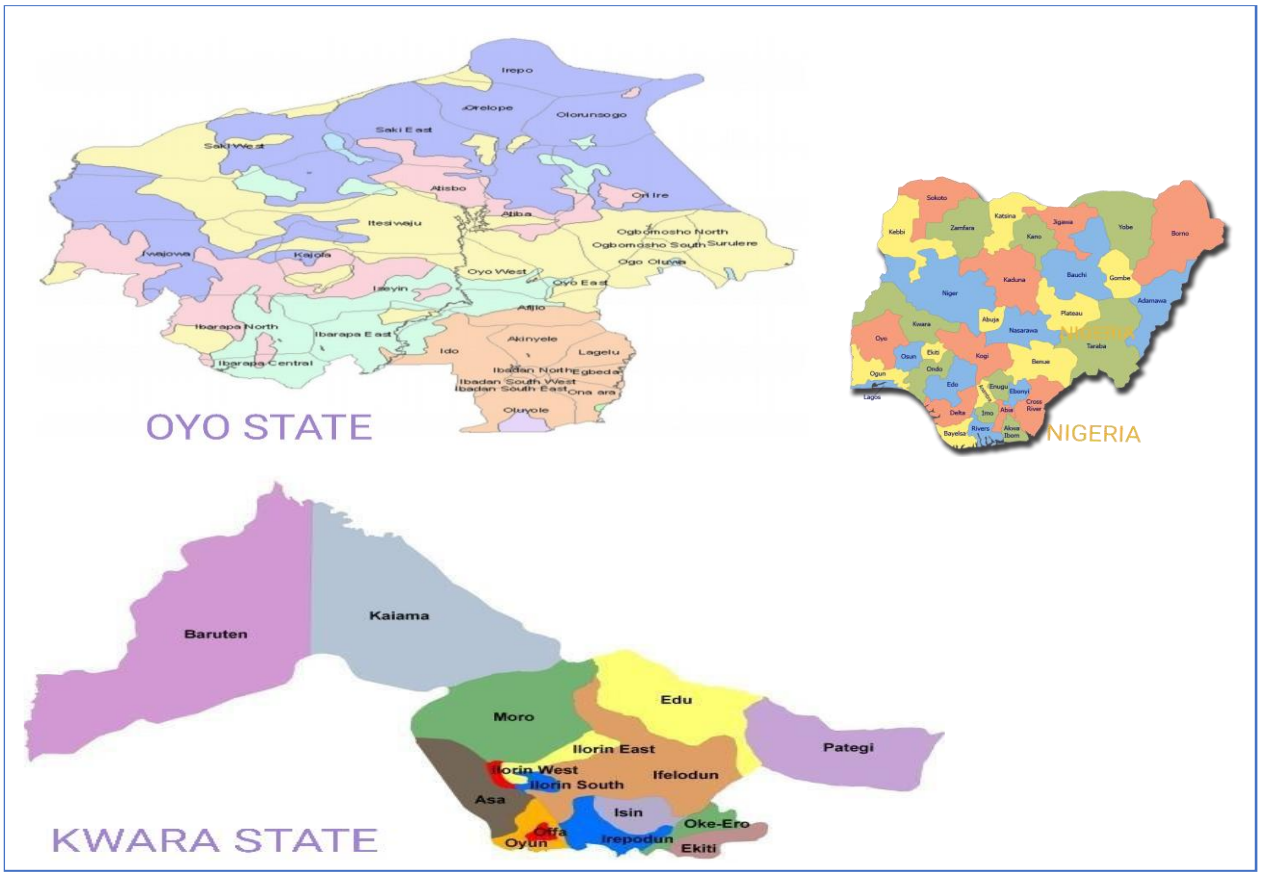

Figure 1. Map of the study area showing the two states selected
Source: Authors' design, 2022

grown in the country. Rural vegetable farmers make up the population for this study.

Sampling techniques and data collection

A multi-stage sampling technique was used in the selection of sampled households that provided data for this study. In the first stage, two states were randomly selected (Oyo State from the South-west and Kwara State from the North-central geopolitical zone). Thereafter, four Local Government Areas (LGAs) were selected randomly from each state, making eight LGAs. The third stage involved a random selection of five rural farming communities from each LGA, making 40 rural communities. Lastly, ten vegetable farming households were selected randomly from each farming community, thus making 400 farming households for this study.

Primary data were collected from the vegetable farmers using a semi-structured questionnaire coupled with an interview schedule. The data covered information such as their socio-economic characteristics, farming households' decision for engaging in vegetable production, perceived benefits derived from vegetable production and constraints to vegetable production, among others.

Data analysis

The analytical tools used to analyse the data for this study were descriptive statistics and multiple regression. Descriptive statistics, involving frequency and percentage for dummy and ordinary scaled variables and mean for continuous variables, was used to describe the socio-economic characteristics of the vegetable farmers. Multiple regression was used to examine the factors affecting vegetable farmers' income.

Following Fadipe et al. (2014) and Mukaila et al. (2021a,b), multiple regression was used to examine the effect of vegetable production on farmers' income and identify other determinants of farmers' income. It is explicitly expressed as:

$$Y = \beta_0 + \beta_1 V + \beta_2 A + \beta_3 HS + \beta_4 ED + \beta_5 FE + \beta_6 FS + \beta_7 AE + \beta_8 AC + e \quad \ldots\ldots(1)$$

Where Y is the annual income (NGN, ₦), V is vegetable production in terms of its yield (kg per ha), A is the age of the farmers (years), HS is the household size (number of people in the household), ED is the educational level of the farmer (years), FE is the farming experience (years), FS is farm size (hectare), AE is access to extension service (1 = yes, 0 = no), AC is access to credit

loan facilities (1 = yes, 0 = no), β_0 is constant, β_1 to β_8 are the coefficients and e is the error term.

A five-point Likert scale score was used to explore how vegetable production has improved farmers' livelihood based on their perception and to identify constraints faced in vegetable production, as it was used in previous studies (Kshash, 2019; Obetta et al., 2020). A set of constraints were itemized and the farmers were asked to indicate their perceived level of severity to each of the problems (the same was done for perceived benefits). The scale ranges from extremely severe (5), very severe (4), severe (3), mild severe (2) to not severe (1). A mean score of 3.0 was used as the decision point for considering a constraint as severe and the respondents' average score on each item was obtained. Any constraint with a mean value equal to or greater than 3 was considered severe problems while those that were less than 3 were considered not severe constraints. The weighted score and mean were used to rank the listed constraints based on their severity. Similarly, any benefit with a mean value equal to or greater than 3 was considered a major benefit while those that were less than 3 were considered minor benefits.

RESULTS and DISCUSSION

Socioeconomic characteristics of vegetable farmers

Socioeconomic characteristics of vegetable farmers varied (Table 1). The results presented in Table 1 revealed that vegetable farming was dominated by female farmers. The few males involved in vegetable production in the study area usually grow okra and tomatoes while the female farmers usually grow leafy vegetables. The majority of the vegetable farmers were adults and there was low youth participation in vegetable farming as previously indicated by Ayodele et al. (2021). The majority of the vegetable farmers were married and had a large household size which is not surprising as rural households comprised of extended family. The rural farmers, especially in Sub-Saharan Africa, care to have many people in their household to be used as labour on the farm. This large household size assists them in the production of vegetables and other farming activities.

A relatively high level of illiteracy exists among the vegetable farmers. This low formal education could affect them in decision making relating to adopting innovation as the higher educational status is expected to be accompanied by the adoption of innovation, accessibility of information and their usage for increased vegetable production. The vegetable farmers cultivated an average of 1.87 hectares of land indicating small-scale farming. Regarding cooperative society where vegetable farmers can pool their resources to venture into large scale production and get inputs at a lower price, the level of participation was very low. This contributed to their low access to credit facilities as cooperative society is an important means of informal finance to rural farmers (Falola et al., 2022). Ashagidigbi et al. (2018) also reported low access to credit among vegetable farmers. Similarly, access to extension services was low with the number of contacts ranging from one to two times a year. This implies that the majority of the farmers did not have access to extension agents who can educate them on the best vegetable farming practice and introduce innovation to them. The vegetable farmers had an average monthly income of N28,745.43 (USD 69.94). Vegetable production accounted for over 80% of their income while other farm income accounted for a lesser proportion of their income. This suggests that vegetable production is a profitable venture and had a significant effect on their economic status. Farming is the main occupation in the study area accounting for 82.2% of the workforce. The vegetable farmers had an average farming experience of about 22 years. Thus, the vegetable farmers can be described as well-experienced farmers who are knowledgeable about growing of vegetables and other farming activities. This further shows that vegetable production is an aged long venture in the study area.

Table 1. Socio-economic characteristics of vegetable farmers

Characteristic	Category	Percentage (n=400)	Mean
Gender	Male	10.6	
	Female	89.4	
Age	≤40	14.4	54.51
	41-50	18.8	
	51- 60	35.6	
	>60	31.1	

Source: Authors' computation from field survey, 2021.

Table 1 (continued). Socio-economic characteristics of vegetable farmers

Characteristic	Category	Percentage (n=400)	Mean
Marital status	Married	88.3	
	Single	11.7	
Educational status	No formal education	42.8	
	Primary education	32.2	
	Secondary education	21.1	
	Post-secondary education	3.9	
Household size	≤4	15.2	9
	5-7	35.9	
	>7	48.9	
Total farm size (ha)	0.4-2.39	83.9	1.87
	2.4-3.99	12.2	
	≥4	3.9	
Cooperative membership	Non-member	81.7	
	Member	18.3	
Access to credit	Without access	73.3	
	With access	26.7	
Monthly income (₦)	10,000 - 20,000	18.7	28,745.43
	20,001-30,000	32.1	
	30,001-40,000	47	
	≥40,000	2.3	
Access to extension services	With access	33.3	
	Without access	66.7	
Primary occupation	Farming	82.2	
	Civil servant	1.7	
	Trader	12.2	
	Artisan	3.9	
Farming experience (years)	≤10	22.8	22.31
	11-20	30	
	21-30	22.2	
	≥30	25	

Source: Authors' computation from field survey, 2021

Vegetable crops grown in the study area

The vegetables cultivated among the farmers varied (Table 2). All vegetable farmers always cultivate *Corchorus olitorius* L. (Jute mallow). The majority of farmers always cultivate *Amaranthus hybridus* L. (Green amaranth) and *Celosia argentea* L. (Plumed cockscomb). The majority of farmers always cultivate *Abelmoschus esculentus* L. (Okra or ladies' finger) and Capsicum annuum L. (Pepper). A significant proportion of farmers always grow *Solanum lycopersicum* L. (Tomatoes). A significant proportion of the farmers cultivated *Telfairia occidentalis* Hook F. (Fluted pumpkin) and *Talinum triangulare* Jacq. (Waterleaf). This result suggests that vegetables were widely grown and consumed in the study area. In terms of the vegetable level of production, jute occupies the largest proportion of the vegetable field followed by green amaranth while water leaf occupies the least proportion. It is worth noting that the majority of the farmers always supply their vegetables to wholesalers and retailers while few of them always sell directly to the final consumer (this is common among farmers with a small plot of the vegetable farm due to their low output).

Table 2. Vegetable crops cultivated in the study area

Vegetable	Always Frequency (%)	Occasionally Frequency (%)	Never Frequency (%)	Likert Mean
Corchorus olitorius	400 (100)	0 (0)	0 (0)	3
Amaranthus hybridus	392 (98)	8 (2)	0 (0)	2.96
Celosia argentea	324 (81)	64 (16)	12 (3)	2.80
Capsicum annuum	160 (40)	184 (46)	56 (14)	2.26
Solanum lycopersicum	180 (45)	136 (34)	84 (21)	2.24
Abelmoschus esculentus	112 (28)	184 (46)	104 (26)	2.02
Telfairia occidentalis	64 (16)	192 (48)	144 (36)	1.80
Talinum triangulare	76 (19)	144 (36)	180 (45)	1.73

Source: Authors' computation from field survey, 2021.

Determinants of vegetable farmers' annual income

Vegetable production in terms of its output had a positive and significant effect on vegetable farmers' annual income (Table 3). This suggests that an increase in vegetable output will increase farmers' income. This implies that the growing of vegetables is very important to the rural farmers' income and plays a significant role in their households' economic status. Vegetable production serves as a significant source of income to the farmers and helps them with the cash needed for their daily households' needs.

Household size positively influenced farmers' total annual income. This disagrees with Fadipe et al. (2014) that household size had a negative effect on income. An increase in household size can increase farmers' output through serving as family labour for vegetable production and assisting in the marketing of the produce. This will, in turn, increase the income earned by farmers. Furthermore, the availability of family labour can influence farmers' decision to seek and cultivated more land which will, in turn, increase the vegetable output and income derived from it. This result is in tandem with the finding of Mukaila et al. (2021b) who reported that household size had a positive influence on rural income.

Table 3. Factors influencing vegetable farmers' annual income

Variables	Coefficient	Std. Error	T	P>t
Vegetable output	3.8147***	0.3430	11.1216	0.0000
Age	613.3932	430.4654	1.4250	0.1581
Household size	10528.7621***	1579.6742	6.6651	0.0000
Education	475.4509	4528.1489	0.1050	0.9171
Years of farming experience	-253.7182	439.0221	-0.5779	0.5651
Farm size (hectare)	14175.8721***	4921.5878	2.8803	0.0051
Access to extension service	-2110.5734	7156.7479	-0.2949	0.7687
Access to credit facilities	12843.0456*	6998.7932	1.8350	0.0680
Constant	-95981.4654***	27359.0788	-3.5082	0.0010
R-square = 0.73				
F (8, 81) = 27.49				
Prob>f = 0.0000				

Source: Authors' computation from field survey, 2021; ***$p \leq 0.01$, *$p \leq 0.1$.

Farm size also influenced vegetable farmers' income positively. This suggests that an increase in farm size will increase farmers' income. This result implies that vegetable farmers who cultivated larger farmland produced more vegetables which will, in turn, increase the farmers' income. Whereas farmers that have a smaller farm size under cultivation will have fewer vegetables for public consumption and less income derived from it, *ceteris paribus*. This corroborates previous findings that household size positively influenced farmers' income (Nzabakenga et al., 2013; Fadipe et al., 2014; Ryś-jurek, 2019; Mukaila et al., 2021a).

Access to credit was positively significant in relation to vegetable farmers' income (Table 3). This suggests that the more access farmers have to credit facilities, the higher their income. This is because access to credit paves way for farmers to improve on their production. Access to credit increased the capital available to a farmer which is used in farming activities, this will increase such farmer's level of investment and output. An increase in output will thus increase the annual income of the farmers. A similar result was reported by Mukaila et al. (2021a) that access to credit enhances smallholder farmers' income.

Effect of vegetable production on the livelihood of the rural farming households

The distribution of vegetable farmers according to their perceived effect of vegetable production on the households' livelihood was presented in Table 4. About 95 per cent of the farmers strongly agreed that vegetable production is a source of employment to them and their households. The household members assist the farmers in vegetable production activities and marketing of the vegetable produce, thereby providing a means of livelihood to them. The majority strongly agreed that the growing of vegetables served as a source of income and/or increased their income. Rai et al. (2019b) also reported that vegetable farming serves as a source of income and employment. Furthermore, the majority of the farmers also strongly agreed that vegetable production helps them in meeting their basic needs of life by providing a daily income to their households. This is as a result of the selling of leafy vegetables such as *Corchorus olitorius* and *Amaranthus hybridus* daily.

Table 4. Perceived effects of vegetable production on the livelihood of rural households

Benefit	S.A. %	Agree %	Und.%	Disagree %	SDIS.%	Likert Mean
Employment	94.5	5.5	0	0	0	4.92
Provision of daily income	89	11	0	0	0	4.89
Meeting basic needs	85.6	14.4	0	0	0	4.41
Increased food availability	55	44.4	0.6	0	0	4.54
Improved nutrition	81.1	18.9	0	0	0	4.44
Payment of Children school fees	70	27.8	2.2	0	0	4.70
Improved standard of living	62.2	33.9	3.9	0	0	4.14
Increase savings	54.4	38.9	6.7	0	0	4.39

Source: Authors' computation from field survey, 2021; S.A. = strongly agree, Und. = undecided, SDIS. = strongly disagree.

More than half of the farmers strongly agreed that vegetable production increased food available to their households. Through the provision of daily income from vegetable farming, the farmers were able to purchase foods that were not produced on the farm thereby improving their food security status. This supports Mathewos et al. (2018) that vegetable contributes to households' food consumption. The majority of the farmers strongly agreed that vegetable farming improved their nutritional status. As it is well known that being food secure is not only about consuming any food but eating nutritional foods. Utilization of nutrients from consuming vegetables will improve their nutritional status by supplying their body with several nutrients such as vitamins, potassium, magnesium, calcium, iron, beta-carotene, dietary fibre, folate (folic acid) and other nutrients that contribute to their healthy life. From the income derived from vegetable production, the majority of the farmers were able to send their children to school and improve their standard of living. The farmers also agreed that vegetable production helped them to save for a future purpose. Further analysis revealed that all the listed benefits derived from vegetable farming had a mean score greater than the mean of the Likert score (3.0). This suggests that all the benefits derived from vegetable production as perceived by the farmers were major benefits and effective. These results imply that vegetable production had a positive effect on the livelihood of the rural farming households and improved their wellbeing. This supports the findings of previous studies (Asongwe et al., 2014; Rai, 2017; Rai et al., 2019).

Constraints faced in vegetable production

The constraints faced by vegetable farmers in vegetable production were presented in Table 5. The farmers agreed that pest and diseases was a severe constraint faced in vegetable production and it was ranked first among the constraints. This suggests that pests and diseases were a major challenge to vegetable production. Pest attacks and diseases caused serious damage to the vegetable grown in the area. Most of the farmers find it difficult to effectively control the pests

and diseases due to the high cost of pesticides and poor knowledge of controlling them. This lowers the quality and quantity of their output which affected the price and consequently their income. This supports previous findings that pests and diseases are major constraints in vegetable farming (Kumar et al., 2018; Manu et al., 2019). The farmers were also faced with the problem of the poor storage structure which agrees with the findings of Manu et al. (2019). Most of the farmers do not have a storage structure where they can store their products after harvest. Considering the perishability of the produce, it is a big challenge if they were unable to sell their products the same day it was harvested, especially the leafy vegetables. This hinders their production activities and resulted in a post-harvest loss. There was a high loss in vegetables between the harvesting period and consumption due to poor infrastructures mitigating the marketing system. The post-harvest loss was, therefore, agreed to be a severe constraint by the farmers. This resulted in poor pricing and a reduction in their income. Wongnaa et al. (2019) reported a similar finding that postharvest loss severely affected exotic vegetable production.

Poor credit facilities also hinder vegetable production. The farmers were unable to access loans from the commercial bank due to lack of collateral and the majority did not belong to a cooperative society where they can easily access funds/credit. The importance of capital in agriculture cannot be overemphasized as the choice to large scale farming strongly depends on the farmer's access to farming capital. This poor access to credit facilities makes the farmers use only their resources/funds to carry out vegetable production, whereas this personal funding is not enough for them to operate on a large scale. This makes most of the farmers remain stagnant at the small-scale level. The high cost of inputs (herbicides, pesticides, insecticides, seeds and fertilizer) was also a severe constraint faced in vegetable production in the study area. The high prices accruing to agricultural inputs (whereas capital available for the production process by farmers is quite small) constitutes a serious barrier to increasing production. This is in line with the findings of Manu et al. (2019) and Wongnaa et al. (2019) that high cost of input severely affected vegetable farmers in their production activities.

Poor knowledge of irrigation was also considered a severe constraint to vegetable farming by the farmers. Vegetable farming requires a constant water supply for its effective production, especially, during the dry season. Poor knowledge of irrigation hinders farmers from its usage. This affects their production activities during the dry season and resulted in low vegetable output. Furthermore, inadequate transportation and poor road network to transport produce to the market were also severe barriers to vegetable production. Poor road conditions increased the time spent transporting the produce to the market thereby reducing the level of production and increasing the cost of production. Poor road conditions also resulted in the damaging of vegetable crops, especially tomatoes, before getting to the market. This led to low quality and poor pricing of tomatoes and other vegetables.

Poor extension service also contributed to the constraints faced by farmers in vegetable production. There were few readily available extension agents to disseminate useful information on the best vegetable farming practice and to introduce new technologies in farming. For this, most of the vegetable farmers still operate traditionally which resulted in low output. This agrees with the findings of Kshash (2019) and Manu et al. (2019). Farmers also faced the problem of poor market/pricing due to damage caused to the produce and the inability to store the vegetables. These make the farmers sell at a low price to avoid further spoilage to the product if it is unsold till the following day. Rai et al. (2019a) reported a similar result that price fluctuation was a severe constraint that affected vegetable farmers.

Table 5. Constraints faced in vegetable production

Constraints	ES %	VS %	S %	MS %	NS %	WS	LM	R
Pest and diseases	45.4	38.9	11.1	3.3	1.1	764	4.24	1st
Poor storage facilities	40	35.6	18.9	3.3	2.2	734	4.08	2nd
Post-harvest loss	38.9	31.1	17.8	10	2.2	710	3.94	3rd
Poor credit facilities	26.7	34.4	23.3	11.1	4.4	662	3.68	4th
High cost of inputs	14.4	33.3	30	17.7	4.4	604	3.36	5th
Poor knowledge of irrigation	18.8	30	23.3	20	7.7	598	3.36	6th
Poor transportation	20	26.7	26.7	18.8	7.7	598	3.32	7th
Poor extension	17.8	27.8	25.6	24.5	4.4	594	3.30	8th

Source: Authors' computation from field survey, 2021; ES = extremely severe, VS = very severe, S = severe, MS = mild severe, NS = not severe, WS = weighted score, LM = Likert mean and R = rank.

Table 5 (continued). Constraints faced in vegetable production

Constraints	ES %	VS %	S %	MS %	NS %	WS	LM	R
Poor market/pricing	12.21	18.8	33.3	20	15.6	546	3.08	9th
Soil infertility	5.5	25.6	24.4	43.3	1.1	524	2.91	10th
Non-availability of quality seed	14.4	15.5	33.3	16.7	20	518	2.88	11th
Inability to hire labour	6.1	22.2	24.4	23.3	23.9	432	2.40	12th
Weed	1.1	3.3	7.8	51.1	36.7	326	1.78	13th

Source: Authors' computation from field survey, 2021; ES = extremely severe, VS = very severe, S = severe, MS = mild severe, NS = not severe, WS = weighted score, LM = Likert mean and R = rank.

Consequently, the study concludes that vegetable production contributed immensely to rural household income, economic status, livelihoods and wellbeing. Thus, vegetable production is very important for rural farmers' revenue, refining economic wellbeing and quality of rural households' life, and can be targeted as a tool to improve livelihood, alleviate poverty, reduce malnutrition and food insecurity in rural areas. Despite vegetable production importance, farmers were faced with constraints such as pests and diseases, poor storage facilities, post-harvest loss, inadequate credit facilities, high cost of inputs, poor knowledge of irrigation, poor transportation and poor extension services.

This study calls for the provision of accessible, available and affordable credit facilities by banks, government, non-governmental organisations and relevant bodies to the vegetable farmers at a lower or no interest rate. This would encourage more participation in vegetable farming, especially the youths, increase farmers' income, curb most of the constraints faced in vegetable farming and better rural households' wellbeing. Designating more extension agents to the rural areas to educate and enlighten the vegetable farmers on the use of irrigation systems and modern farming practices is very important. This would enable the farmers to produce vegetables all year round and make more profit, ceteris paribus. This will, in turn, increase their output and income generated from vegetable farming. Considering the perishable nature of vegetables and high post-harvest loss due to lack of storage facilities, there is a serious need to develop and make available central storage facilities where farmers can effectively store their vegetables. This would help to control price instability or poor pricing due to post-harvest loss. All the aforementioned recommendations will better the livelihood and wellbeing of the rural farmers including their household members both in the short and long run.

ÖZET

Amaç: Gelişmekte olan ülkelerde, özellikle kırsal *kesimdeki* hanelerde artan gıda güvensizliği ve yoksulluğun önüne geçmek için daha fazla çaba ve önlem gerekmektedir. Kırsal hanelerin sebze üretimine katılması, yoksulluğun azaltılmasında, beslenme durumlarının ve geçim kaynaklarının iyileştirilmesinde önemli bir rol oynayabilir. Bu nedenle, bu çalışma Nijerya'da sebze üretiminin kırsal çiftçilerin geliri ve hane halkının geçim kaynakları üzerindeki etkisini araştırmaktadır.

***Yöntem ve Bulgular*:** Sebze yetiştiren 400 haneden toplanan veriler, tanımlayıcı istatistikler ve çoklu regresyon kullanılarak analiz edildi. Sonuçlar, sebze çiftçiliğinin kadın egemen bir girişim olduğunu ortaya koydu (%89,4 kadın). Regresyon sonuçları, sebze üretiminin kırsal hanelerin geliri üzerinde pozitif ve anlamlı bir etkiye sahip olduğunu ortaya koymuştur. Çiftçilerin gelirini etkileyen diğer faktörler hane büyüklüğü, krediye erişim ve çiftlik büyüklüğü idi. Ayrıca sebze üretimi, istihdam, gelir, temel ihtiyaçlar, gıda, okul ücretlerinin ödenmesi, beslenme durumlarını ve yaşam standartlarını iyileştirerek kırsal kesimdeki hanelerin geçim kaynakları üzerinde olumlu etkiler yarattığı gözlenmiştir. Zararlılar ve hastalıklar, yetersiz depolama tesisleri, hasat sonrası kayıplar, yetersiz kredi olanakları, yüksek girdi maliyetleri, yetersiz sulama bilgisi, yetersiz ulaşım ve yetersiz yayım hizmetleri, sebze üretiminde karşılaşılan en ciddi kısıtlamalar olarak belirlenmiştir.

Genel Yorum: Sebze üretiminin kırsal hanelerin ekonomik durumuna, geçimine ve refahına büyük katkı sağladığı söylenebilir. Bununla birlikte, girişimler bazı zorluklarla karşı karşıya kalmaktadır. Bu nedenle, çiftçilere bankalar, devlet ve sivil toplum kuruluşları tarafından erişilebilir ve uygun fiyatlı kredi imkanları sağlanması, çiftçileri teşvik edeceği, kısıtlamaların çoğunu azaltacağı ve gelirlerini artıracağı için önemlidir.

Çalışmanın Önemi ve Etkisi: Sebze üretiminin kırsal kesimde yaşayanların gelir ve geçim kaynakları üzerindeki etkilerini anlamak katılımı artıracaktır. Bu nedenle, bu çalışmanın sonucu, politika yapıcıların yoksulluğu ve yetersiz beslenmeyi azaltmak ve kırsal kesimdeki hanelerin refahını iyileştirmek için üretime müdahale etmesine izin verecektir.

Anahtar Kelimeler: Gıda güvensizliği, geçim kaynağı, yoksulluğun azaltılması, kırsal haneler, sebze yetiştiriciliği.

CONFLICT OF INTEREST

The authors declare no conflict of interest for this study.

AUTHOR'S CONTRIBUTIONS

The contribution of the authors is equal.

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