URBAN RESIDENTS PERCEIVED ABILITY TO UNDERTAKE VEGETABLE FARMING FOR FOOD SECURITY IN DELTA STATE

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Abstract
Urban agriculture refers to the production of food crops, fruit trees, livestock, poultry, fish, bees and other locally edible and non-food items for both residential and commercial use in urban and peri-urban regions. This paper examined urban residents' perceived ability to engage in vegetable farming as a means of enhancing food security in Delta State. The study was guided by three research objectives and hypotheses. A structured questionnaire was administered to 185 urban residents across three geographical regions: Delta North, Delta South, and Delta Central. The collected data was analyzed using mean and standard deviation, while a need assessment was conducted to address the third research question. A t-test statistic was utilized to determine significant differences between male and female city residents. The results revealed a strong need for urban residents to access information on climate conditions, the services of extension agents, sources for obtaining seeds, fertilizers, organic manure, and irrigation techniques for vegetable farming. Additionally, the findings highlighted the need for improvement in technical skills related to vegetable production, including seed dressing, tillage, harvesting, transplanting, weeding, pruning, and compost preparation. The study recommends that extension service agents should increase their visits to urban farms to provide guidance on modern vegetable farming techniques. It also suggests that the government should organize seminars and workshops to improve access to relevant agricultural information.

Keywords: agriculture, urban farmers, food security, perceived ability, vegetable farming

Introduction
Agriculture is an important component of the economy of many developing countries as it significantly contributes to domestic food production, employment, and revenues (Food Agricultural Organization, 2016). It can be practiced in both rural and urban areas. Approximately 3.1 billion people, or 45% of the global population live in rural areas, with 2.5 billion of them relying on agriculture for their livelihood (FAO,2016). Urban agriculture refers to the cultivation of plants and the rearing of animals primarily for food and other domestic use within cities and towns. It involves activities such as the production, processing, marketing and distribution of agricultural products. Urban agriculture includes various production systems, ranging from small-scale domestic production and household-level processing to larger-scale commercial agriculture. Involvement in urban agriculture is highly recommended for the city as it serves as a sustainable development strategy for any nation and offers numerous environmental benefits. This practice involves growing food crops, and fruit trees, and the raising of animals, including poultry, fish, bees, and other stock considered edible locally and non-food items within urban and semi-urban areas for home consumption and for sale. Urban agriculture can be further

defined as agricultural cultivation production in homes or plots located in urban or peri-urban areas. It includes livestock keeping and crop cultivation within cities and towns (Nzimande, 2013). Urban and peri-urban agriculture represents an industry located within (intra-urban) or on the outskirts (peri-urban) of a town, city or metropolis. This industry focuses on growing, raising, processing and distributing a variety of agricultural products, utilizing mainly the human, land and water resources available in and around this urban area (Nzimande, 2013).

Vegetables are typically described as plants that are consumed in relatively small quantities as a side dish with staple foods. The term "vegetable" also refers to the edible shoots, leaves, fruits and roots of plants that can be eaten raw or cooked, serving as a supplement to starchy foods and meets (Adams, 2016). According to Adams (2016), vegetable and vegetable products particularly those processed and imported, are essential components of diets in many African countries. This reliance often involves the use of limited foreign exchange resources. Vegetables play a vital role in human nutrition, providing essential vitamins, minerals, and the necessary bulk of roughage the body needs that is often lacking in traditional staple foods. It is common to see urban residents utilizing their backyards primarily for the cultivation of vegetable crops, an activity typically undertaken by men, while the marketing of these products largely falls within the domain of women.

Vegetable production plays a vital role in supporting livelihoods and ensuring food security. According to Danso et al. (2013), urban farmers cultivate the majority of vegetables consumed in cities across Nigeria. This farming often takes place in virtually every available open space, particularly near water sources, in most cities and urban centres throughout the West African sub-region. Several factors can limit the productivity of vegetables required for daily consumption. These factors include a lack of adequate information on modern methods to improve vegetable production, limited access to credit for acquiring the necessary species for optimal yield, challenges related to land usage for vegetable farming and insufficient labour to enhance vegetable production. Vegetables are important for both domestic and export markets as nearly all households in Nigeria include them in their diets. Nutritionally, vegetables are good sources of vitamins, protein minerals and fibre. For those in producing areas, vegetable production has historically been a major source of income for farmers. Initially, this production was largely subsistence-based, with a significant portion consumed by the farming household. However, due to increased demand for dry-season vegetables, many producers now view vegetable farming as a business and cultivate year-round. Vegetables are considered high-value crops, that require intensive cultural practices and the financial, and labour inputs needed are greater than those required for most staple crops (Adams, 2016).

In Delta State, the majority of urban residents reside in major cities such as Asaba, Warri, Ughelli, and Sapele, among others. Not all citizens in these areas are actively or even passively engaged in urban agricultural practices. Hence, it becomes pertinent to encourage more residents to practice urban agriculture, particularly vegetable farming due to its numerous benefits. Involvement in vegetable farming by city residents can significantly enhance food security within the city. To achieve this success, individuals must acquire relevant skills related to

agricultural practices. Consequently, it has become essential to improve their competencies in vegetable farming (Bullum, et al., 2021).

Research Questions

The following research questions were raised to guide the study.

1. What is the perceived ability of city residents to effectively utilize information for vegetable production to ensure food security in Delta State?
2. What is the perceived level of technical skills of city residents for vegetable production to enhance food security in Delta State?
3. What are the perceived needs of city residents regarding access to information, technical skills, and resources to improve vegetable production and ensure food security in Delta State?

Hypotheses

The following hypotheses were formulated and tested at a 0.05 level of significance:

Ho_1: There is no significant difference in the mean responses of male and female city residents' perceived ability level of information in the production of vegetables for food security.

Ho_2: There is no significant difference in the mean response of male and female city residents' perceived ability level of technical skills in the production of vegetables for food security

Methods

This study adopted the descriptive survey method, which according to Ngwogu (2006) involves collecting and analyzing data from a sample of respondents or items believed to represent the entire sampled population group. This design is deemed appropriate for gathering the opinions of respondents regarding the perceived need among city residents to engage in vegetable farming to ensure food security in Delta State. The study was conducted in Delta State, situated in the south-south geographical zone of Nigeria, focusing on three senatorial districts. The population of the study comprised 250 registered city residents involved in vegetable farming practices, from which 185 city residents were purposively selected, as they had verified addresses that facilitated their location out of the original 250 city residents.

The instrument used for data collection was a structured questionnaire. The researcher visited the farmers residing in the sample cities across the three senatorial districts to administer the questionnaire, explaining its purpose to the respondents. Each item in the questionnaire follows a four-point Likert scale of strongly disagree (1), Disagree (2), Agree (3), and Strongly Disagree (4). The instrument was subjected to face and content validation with inputs from three experts made up of one agricultural educationist and two specialists in measurement and evaluation from Delta State University, Abraka. Their feedback was sought to ensure clarity and eliminate ambiguity in the language, confirming that the instrument effectively measures its intended construct. All amendments, critiques and ideas were incorporated into the final draft.

The reliability of the instrument was established using the test-re-test technique administered twice at an interval of two weeks to 10 respondents in Edo state who were involved in vegetable farming who will not constitute the entire sample size. The Pearson Coefficient Formula was used to correlate the results of the first and second administrations, yielding a reliability coefficient of 0.81, which indicates that the instrument is reliable for the study. Data were analyzed using mean and standard deviation to answer the research questions while for the third research question, the discrepancy approach was utilized using the formula: Perceived Level of Need = Total Mean Criterion – Perceived Ability Level. The decision rules for the research questions were based on a mean value of 2.50; items with a calculated mean of 2.50 and above are regarded as agreed while any item with a mean below 2.50 will be regarded as disagreed. A T-test was used to test the null hypothesis at a 0.05 level of significance.

Results

Research Question 1: What is the perceived ability of city residents to effectively utilize information for vegetable production to ensure food security in Delta State?

Table 1: *Responses of city residents about access to information on vegetable farming (N = 182)*

S/N	Access to Information on vegetable farming	Mean	SD	Remark
1	On climate information/services	2.97	0.92	Agreed
2	On extension agents' service	2.84	0.96	Agreed
3	On information on how to get seeds	2.76	0.98	Agreed
4	On provision of credit facilities to vegetable farmers	2.85	0.96	Agreed
5	On fertilizers and organic manure to vegetable farmers	2.96	0.91	Agreed
6	On regulation of prices provision of storage and preservation facilities	2.98	0.92	Agreed
7	On training on modern methods of vegetable cultivation	2.85	0.96	Agreed
8	On irrigation of vegetables	2.82	0.97	Agreed
9	On modern methods of harvesting vegetables	3.11	0.95	Agreed
	Grand Mean	**2.90**		**Agreed**

Source: Fieldwork 2024

Table 1 shows the responses of respondents on the perceived ability levels of city residents on their information needs for vegetable production for sustainable development. All calculated mean scores fall within the range of 2.76 to 3.11, exceeding the mean criterion of 2.50, with a standard deviation between 1.32 and 1.41. Notably, the information needed related to obtaining vegetable seeds received the lowest mean score, while modern harvesting methods had the highest mean value. The overall grand mean of 2.90 indicates a high level of perceived information needs among city residents concerning vegetable production for sustainable development.

Research Question 2: What is the perceived level of technical skills of city residents for vegetable production to enhance food security in Delta State?

Table 2: *Responses of city residents about Perceived Level of Technical Skills (N = 182)*

S/N	Perceived Level of Technical Skills	Mean	SD	Remark
1	Preparation of land for planting	2.90	0.96	Agreed
2	Preparing of Nursery	2.95	0.91	Agreed
3	Transplanting	2.91	0.95	Agreed
4	Weeding	2.93	0.93	Agreed
5	Application of fertilizer	2.97	0.92	Agreed
6	Irrigation	3.04	0.86	Agreed
7	Preparation of Compost pit	2.89	0.96	Agreed
8	Tillage	2.76	0.97	Agreed
9	Staking	2.87	0.95	Agreed
10	Harvesting	2.94	0.91	Agreed
11	Pruning	2.93	0.93	Agreed
12	Top dressing	3.00	0.84	Agreed
13	Beds preparation	2.93	0.93	Agreed
14	Bridging	2.97	0.92	Agreed
15	Clearing	2.99	0.92	Agreed
	Grand mean	**2.93**		**Agreed**

Source: Fieldwork 2024

The data presented in Table 2 shows the perceptions of respondents regarding the technical skills of city residents in vegetable production for sustainable development. The result shows that all respondents agreed that the listed items represent various essential technical skills beneficial for vegetable production aimed at sustainable development. The calculated mean scores ranged from 2.76 to 3.04, all exceeding the mean criterion of 2.50, with standard deviations between 1.32 and 1.42. Among the perceived abilities related to vegetable production, the tillage of the soil received the lowest mean score, while irrigation garnered the highest mean value, closely followed by the top dressing of vegetable plants. The overall grand mean of 2.93 suggests a high level of perceived level of technical skills among city residents engaged in vegetable production for sustainable development.

Research Question 3: What are the perceived needs of city residents regarding access to information, technical skills, and resources to improve vegetable production and ensure food security in Delta State?

Table 3: *Responses of city residents about Access to Information on vegetable farming (N = 182)*

S/N	City residents perceived level of need for access to information on vegetable farming.	PAM	PLN	Remarks
1	On climate information/services	2.97	1.03	IN
2	On extension agents' service	2.84	1.14	IN
3	On information on how to get seeds	2.76	1.24	IN
4	On provision of credit facilities to vegetable farmers	2.85	1.15	IN
5	On fertilizers and organic manure to vegetable farmers	2.96	1.04	IN
6	On regulation of prices provision of storage and preservation facilities	2.98	1.02	IN
7	On training on modern methods of vegetable cultivation	2.85	1.15	IN
8	On irrigation of vegetables	2.82	1.18	IN
9	On modern methods of harvesting vegetables	3.11	0.89	IN

Keyword: PAM = Perceived Ability Mean, PLN = Perceived Level of Need, IN = Improvement Needed
Source: Fieldwork 2024

The data presented in Table 3 highlights the responses of city residents regarding their perceived needs in vegetable farming for sustainable development. All calculated mean scores range from 0.89 to 1.24, which is significantly below the mean criterion of 2.50. Among these needs, access to modern harvesting methods for vegetables received the lowest mean score, while information on obtaining seeds had the highest mean value. Overall, there is a strong perceived need among city residents for access to information related to vegetable farming to support sustainable development.

Table 4: *City residents perceived level of need for technical skills for vegetable farming (N = 182)*

S/N	City residents' perceived level of need for technical skills	PAM	PLN	Remarks
1	Preparation of land for planting	2.90	1.10	IN
2	Preparing of Nursery	2.95	1.05	IN
3	Transplanting	2.91	1.09	IN
4	Weeding	2.93	1.07	IN
5	Application of fertilizer	2.97	1.03	IN
6	Irrigation	3.04	0.96	IN
7	Preparation of Compost pit	2.89	1.11	IN
8	Tillage	2.76	1.24	IN
9	Staking	2.87	1.13	IN
10	Harvesting	2.94	1.06	IN
11	Pruning	2.93	1.07	IN
12	Top dressing	3.00	1.00	IN
13	Beds preparation	2.93	1.07	IN
14	Bridging	2.97	1.03	IN
15	Clearing	2.99	1.01	IN
	Grand mean	**2.93**		

Keyword: PAM = Perceived Ability Mean, PLN = Perceived Level of Need, IN = Improvement Need
Source: Fieldwork 2024

The data presented in Table 4 shows the responses of city residents regarding their perceived level of need for technical skills in vegetable production for sustainable development. The results indicate that all respondents disagreed with the statement that the listed items represent various technical skills necessary for vegetable farmers to achieve sustainability. The calculated mean scores ranged from 0.96 to 1.24, all of which fall below the mean criterion of 2.50. Among the perceived needs, city residents identified a high demand for irrigation skills among vegetable farmers, which received the lowest mean score, while skills related to soil tillage had the highest mean value, followed closely by the staking of vegetable plants. Overall, there is a strong perceived need for technical skills in vegetable production among city residents for sustainable development.

Test of Hypotheses

Hypothesis One: There is no significant difference in the mean response of male and female city residents in their perceived ability levels with regard to access to information in the production of vegetables for food security.

Table 5: *t-test analysis of mean responses of male and female urban dwellers on perceived ability level regarding access to information in vegetable production*

Group	N	$\bar{x}$	SD	df	t_{cal}	t_{crit}	Sig.	Decision
Male	105	2.97	0.92					
				181	2.2	1.97	0.05	Rejected
Female	77	2.79	0.98					

Source: Fieldwork 2024

The results presented in Table 5 show that the t-calculated value is 2.2, which exceeds the t-critical value of 1.97 at a 0.05 level of significance. Hence, the null hypothesis, which states that there is no significant difference between the mean responses of male and female city residents regarding their perceived levels of information needs related to vegetable production for sustainable development is rejected. Instead, the alternative hypothesis is accepted, confirming that a significant difference exists in the perceived information needs of male and female city residents concerning vegetable production for food security. This finding underscores the necessity for enhanced information to boost vegetable production among both male and female residents, ultimately contributing to long-term food security.

Hypothesis Two: There is no significant difference in the mean response of male and female city residents in their perceived ability levels with regard to technical skills in the production of vegetables for food security.

Table 6: *t-test analysis of mean responses of male and female urban dwellers on perceived ability regarding technical skills for vegetable production*

Group	N	$\bar{x}$	SD	df	t_{cal}	t_{crit}	Sig.	Decision
Male	105	3.04	0.86					
				181	4.62	1.97	0.05	Rejected
Female	77	2.83	0.96					

Source: Fieldwork 2024

The results in Table 6 show that the t-calculated value is 4.62, which exceeds the t-critical value of 1.97 at a significance level of 0.05. Hence, the null hypothesis is rejected, which states that there is no significant difference between the mean perceived ability levels of male and female city residents regarding their technical skills in vegetable production for food security. This finding suggests that the perceived ability levels of male and female city residents concerning their technical skills can significantly influence the production levels of vegetables for food security.

Discussion of Findings

The results indicate that the information needs of city residents range from guidance on obtaining vegetable seeds to modern harvesting techniques. There is a high level of perceived capability among residents regarding their information needs for vegetable production, which is crucial for food security. These findings align with Bora et al. (2019), who reported that the majority of respondents (95.83%) expressed a need for information on inspection, modern harvesting, and processing of organic vegetables. Furthermore, 95% of those surveyed sought information on soil treatment (land use) for organic production, 91.60% required knowledge on suitable varieties or planting materials for organic vegetables, 81.60% needed information on packaging practices for organic vegetable production, and 77.50% sought details on organic manure application. This contrasts with the findings of Otite and Okali (1990), who noted that vegetable farmers primarily relied on information from agricultural officers.

Regarding city residents' access to markets for vegetable production, the results show a unanimous agreement among respondents that the identified factors significantly contribute to their perceived market access to food security. This includes direct sales to consumers, engaging employees for home delivery services, and utilizing online marketing strategies. There is a high perceived ability among city residents to access markets for vegetable production. These findings are consistent with Bannor et al. (2022), who noted that factors such as education level, postharvest losses, commercialization, storage capacity, grading and sorting, proximity to markets, extension services, and road conditions influence market outlet choices. Additionally, Yegbemey, et al. (2021) noted that various factors affect vegetable farmers' access to markets,

leading many to reduce their market-oriented vegetable production, focus more on growing vegetables for personal consumption, and add value through home processing and storage, explore new markets opportunities, and accept lower farm gate selling price. Furthermore, Bullum, et al. (2021) emphasized that distance to market and accessibility are significant challenges that can adversely impact vegetable production among urban residents.

Conclusion

In the present state of food inflation and hardship in Nigeria, citizens need to engage in agricultural farming, especially vegetable farming. The study has shown that to increase vegetable production in Delta State, several factors must be taken into account. Notably, the information needs of vegetable farmers, technical skills, and market access are essential. The perceived ability of city residents in vegetable farming demonstrates a positive correlation between these various factors and food security. Additionally, the study reveals that city residents possess a high level of perceived ability in vegetable farming.

Recommendations

Based on the findings, the following recommendations were made:

1. extension service agents should increase their visits to city residents involved in vegetable farming to improve production levels and contribute to food security in Delta State.
2. the government should organize seminars and workshops on modern practices for pre-planting and post-planting of vegetables to boost productivity and ensure food security in Delta State.
3. the government should facilitate access to relevant information and markets, which will lead to increased vegetable production and strengthen food security in Delta State.

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