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Home Gardening as a Panacea to Food Insecurity in Ogun State

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ABSTRACT

This study investigates the role of home gardening as an effective and sustainable strategy in mitigating food insecurity in communities in Ogun state. The study employed a mixed method research approach, which included 200 households across four LGA in Ogun state with quantifiable survey interviews of Agricultural and Nutritional professionals. Data analysis which included descriptive and inferential approach were employed to measure the impact of home gardening on Household food security, food expenditure, Household income and Dietary diversity. Results indicate that 70 % of the households practicing home gardening reported improved yearly access to quality nutritious food items, 65% utilized garden produce as supplementary income source. The study concludes that the implementation of home gardening training into community developmental plans significantly bring an adaptable solution to food insecurity in Ogun state. It also recommends youth participation and policy prioritization which would prioritize agricultural subsidies and gardening input to foster unbiased food systems. The research highlights home gardening as a viable cost-effective solution to food diffidence, as it secures sustainable livelihood and food control for low-income households.

1. Introduction

Food insecurity persists as a critical challenge in Ogun state, Nigeria where climatic, economic condition and urbanization has upset the traditional agricultural system. More households' experience food insecurity while relying on imported food materials resulting in deterioration in the value of local food production in the vicinity. Food insecurity result from lack of access to nutritious food required for human growth, development and healthy living. Food insecurity leads to vulnerability of humans to disease which can be caused by lack of essential nutrient in the food consumed (Thamilini, *et al*., 2019) and causes hunger, malnutrition and other health hazards for human (FAO, 2024). Existing studies focus on large-scale farming which undermines the interplay of agro-ecological conditions, cultural practices

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and low-income household gardening practices. This study addresses these gaps by assessing the impacts of home gardening and its contributions to food security, dietary diversity and household income.

Research Objectives:

1. To assess the impact of household gardening on household food expenditure reduction
2. To determine the contribution of household gardening on household dietary diversity
3. To ascertain the knowledge and perception of household gardeners
4. To assess the relationship between household food security, household gardening participation, monthly income and household size.

Research Hypothesis

$H_{ø1}$: Home gardening has no significant impact on monthly food expenditure reduction
$H_{ø2}$: Home gardening has no significant impact on household dietary diversity
$H_{ø3}$: There is no significant relationship between home gardening participation, food security, monthly income and household size.

2. Literature review

The term food insecurity is used in describing a household access to quality food materials, while food availability is important but not adequate for ensuring food security. Economic and physical access are not sufficient for food utilization, as good nutritional quality is essential for healthy family life (Okojie, *et al.,* 2016). Although policies are being strategized for effective food security, the increase in population size has caused an impending drop in the level of food security in Nigeria, According to Food and Agricultural Organisation (2024), food insecurity involves the lack of consistent access to nutritious food required for growth and nourishment which may be due unattainability of food and resources to acquire food, Reports by FAO (2024) observed the rise in global hunger from year 2019 to 2021 which still persisted till 2023, during this observations the Prevalence of Undernourishment (PoU) was used to study the global food insecurity sale which was dependent on food availability, food consumption and energy need data of each country. The FAO was motivated into developing Sustainable Development Goal two (SDG 2) to support small scale production source and improve the standard of food production by encouraging the implementation of natural resources.

According to Bellundagi, *et al.* (2020), food availability relates to the supply of food within production, distribution and exchange, food access indicates affordability and distribution of food in accordance with household's preferences while food utilization reveals the quality and quantity of food that meets the needs of members of the household.

Oyekale, *et al.* (2017) affirms that several factors constitute to food insecurity whereby lack of income which leads to inadequate access to food is a prominent one, moreover urban households can sufficiently battle food insecurity through adequate income, this might not be possible for households in rural settlement as most of the population are professional farmers who only depend on farm produce as their source of livelihood, Oyekale, *et al.* (2017) suggests that such households are vulnerable to agricultural disaster such as fire, drought and flooding which might reduce their chance of consistent resolutions to food insecurity. Aminu (2023) sustains that households are vulnerable to

food security during food shortage when there is lack of coping mechanism: size of farmland and income based of farm produce reduces the Vulnerability Index in such households.

Ozughalu and Ogwumike (2015) asserts that the food energy intake varies all over Nigerian state due to variation in food prices while food poverty is influenced by household food security, food prices and cultural preferences. One of the defects of food security is malnutrition which may cause growth impairment and mental decline in children, this can also result to lack of productivity in adult as there are frequently vulnerable to diseases due to lack of essential micronutrients (Thamiliini, *et al*., 2019). Globally, home gardens are significant source of food security, as they are regarded as an antique method of cultivation (Kazeem & Jamiu, 2020).

Chivon and Mandy (2023) denote home gardening as homesteading which is an established source of food production in the world, it rallies around the cultivation of vegetable and multiple varieties of crop with minimal management. Gardening helps families to manage their finance and diversify their nutritional intake through economic means, Chivon and Mandy (2023) classified gardens into Herb garden, Kitchen Garden and container garden; with each having its peculiar cost of installation and maintenance. Preparation of home gardens also involves soil preparation, seed selection and fertilization for proper cultivation, decent and densely nutritious garden yields.

3. Methodology

3.1 Study Area

The study was conducted in Ogun state, Nigeria. Which lies at latitude of 6 N and 8 N, longitude of 2 ^{o}E and 15 ^{o}E A region with a land mass of 16,720 Km. sq. and known for having a fertile soil which makes home gardening possible in the area. The state is made up of 1 A humid tropical region has its distinct climatic season during: April to October which is the rainy season and November to March which is classified as the dry season of temperatures around 26^{o}C to 32^{o}C. The study focuses on the challenges faced towards food insecurity, which is driven by climatic condition, low-income livelihood, insufficiency of agricultural policies that supports household gardening, lack of agro-farming funding.

3.2 Research Design

A mixed method approach which entailed quantitative and qualitative method were used to define the research objectives and tools. The Quantitative approach involved the collection of numerical data on household food accessibility, income level, agro-farming practices. The qualitative method explored relative challenges. Survey was conducted with the use of self-designed questionnaire, a total of 225 questionnaires were administered, out of which 200 were used for analysis. During the interview household heads were subjected to questionnaire interview. Respondents were fully informed about the purpose of the study before each interview was commenced.

Population of the study: The population consisted of households that are particularly involved in home gardening most especially those involved in subsistence and supplemental income crop cultivation. The population was selected from 45 households with a total of 200 respondents.

Sample Size Determination: The sample size for the study was determined using the Cochran Formula which is widely used for calculating population sample size. The estimated population for the study

involved households in Ogun state actively involved in home gardening activities. A sample size of 225 respondents was provided based on National population commission 2006 which estimates Ogun state total population around 3,728,098.

$$\text{Cochran formula: } n = \frac{Z^2.p.(1-p)}{e^2}$$

Where:
N = Sample size
Z = Value of 1.96 at 95% confidence level
P = estimated proportion of household with food insecurity maximizing variability at (0.5)
e = margin of error (0.05)

Given that for the survey non-responses and agricultural seasonality, the sample size was allocated to 200 respondents which involves two categories:

- Urban Area: 100 respondents (50% of the sample)
- Rural Area: 100 respondents (50% of the sample)

Sampling Technique and Procedure:

- Multistage sampling technique was employed in the study to ensure representation of sample from diversified population
- Four Local Government Areas were selected based on population density using stratified sampling technique. The sample were classified into 2 Urban and 2 Rural areas.
- Random sampling method was used in selecting the household from 2 Rural LGAs and 2 Urban LGAs.
- Twelve Agricultural professionals were selected using purposive sampling method
- Stratified random sampling was used to identify 200 households practicing home gardening.

3.3 Instrument for Data Collection and Validation of Instrument

The Data instrument involved a structure open and closed questionnaire of which contained sections Section A contains Demographics which include age, gender, education level, household size, level of income, and years of experience. Section B which contains Food Expenditure, Home Dietary Diversity (HDD) and Food Security Index (FSI) was adopted from Oyekale, *et al.* (2017) and Okojie, *et al.* (2017), while Gardeners Perception was adopted from Oral, *et al.* (2022). The questionnaire was pretested with 25 households in Ogun state with a reliability of 0.79 Cronbach alpha confirming its internal consistency. The instrument was subjected to examination by agricultural and nutrition professionals to enhance the validity of the instrument.

3.4 Analytical Techniques

Quantitative data collected from questionnaire were analysed using descriptive and inferential statistics. The descriptive statistics involved the use of Frequency, Mean and Percentage to describe and summarize the data. Inferential statistics used included T-test and regression analysis which were used to assess the relationship among the variables and draw conclusion from the survey data. The Qualitative data were categorized into wider themes, to form eloquent conclusions. The themes were interpreted to provide meaningful insights on how home gardening influences food security and the challenges faced by households practicing gardening. The integration of the validated quantitative and qualitative instruments coupled with robust procedures ensured robust data collection. This approach

enabled the study's credibility and recommendations for leveraging home gardening to combat food insecurity in Ogun state.

Linear Regression Model: The linear regression model is used in determining the relationship between home gardening and food security which involves variables as Dietary diversity, Household Income, Household expenditure, which was adopted from Oyekale, *et al.* (2017). The regression model FSI = B_0 + B_1 +B_2 +B_3. Where the FSI stands for Food Security Index which contains Household dietary Score and Self-reported food security 5-Likert scale. Independent variables included: B_1 Home gardening, B_2 Monthly Income, B_3 Household size. The R software and R-studio Ide V4.3.3 were used to analyse the descriptive and inferential statistics.

4 Results

4.1 Demographic attributes of respondents

Table 1 shows the demographic attribute of respondents which reveals that 53.5% of female practices household gardening of which 36.00% are around the age of 51-60.

Table 1. Demographic characteristics of respondents (n=200)

Variable	Category	Frequency	Percentage (%)	Mean (Sd)
Age (years)	≤20	5	2.50	
	21 -30	15	7.50	
	31 – 40	45	22.50	
	40 – 50	67	33.50	
	51 -60	72	36.00	
	61 -70	44	22.00	
	>70	24	12.00	50.20± 7.50
Career	Non-employed	3	0.15	
	Civil service	37	18.50	
	Business	68	34.00	
	Farming	92	46.00	
Educational Qualification	None	30	15.00	
	Primary Education	56	28.00	
	Secondary Education	66	33.00	
	Tertiary Education	17	8.50	
	Adult Vocation	31	15.50	
Gender	Male	93	46.50	
	Female	107	53.50	
Household Size	1-3	15	7.50	
	4-6	161	80.50	
	>6	24	12.00	
Marital Status	Single	18	9.00	
	Married	161	80.50	
	Divorced	2	1.00	

Variable	Category	Frequency	Percentage (%)	Mean (Sd)
	Widowed	19	9.50	
	<30,000	45	22.50	
	30,000-60,000	114	57.00	
Monthly Income	>60,000	21	10.50	
	0 - 2 years	10	5.00	
	3 - 5 years	50	25.00	
	6 - 10 years	77	38.50	
Years of Experience	>10 years	87	43.50	

Source: Authors' field survey and computation, 2025

80.50% were married and had a family size of around four to six (4-6) family members, 43.5% had about 10 years of experience in gardening and house-based food production. 34.00% are professionally based on business/trade at which only 8.5% had completed tertiary education. 57% earned around (30,000-60,000) Naira on monthly basis. Study by Ilo, *et al.* (2023) shows that higher percentage of women practice household gardening in Ogun State.

4.2 Impact of household gardening on food expenditure reduction (Objective 1, Hypothesis1)

Table 2 assess the impact of home gardening on food expenditure reduction. 42.5% Strongly agreed that home gardening reduced their monthly food expenses at a mean of 4.61 which shows a strongly positive agreement among the respondents, 42.5% Strongly agreed on not being dependent on market groceries in the presence of garden produce at a mean of 4.51, 38% Strongly agreed that their food budget reduced since they start practising home gardening at mean = 4.7. Moreover 27.5% at mean of 3.9 agreed that they had easy access to food material while practising gardening although 21% had a neutral decision on using gardening as a supplementary source of income at mean 3.58 it shows a slightly positive outcome on the financial contribution of home garden to Households in Ogun state which leads to the rejection of $H_{ø1}$. Research conducted by Oyekale, *et al.* (2017) show that home gardening creates a significant financial improvement to households who practice gardening as they have less financial bill to settle daily, weekly and monthly and helps households most especially in rural settlement to diversify their income. Due to the relative demand of vegetable and fruits, home garden is being regarded as a low-level labour which numerously benefit home gardeners (Oral, *et al.*, 2022). Additional, Aminu (2023) affirms the decrease of household's vulnerability to food insecurity when there is an increase in income through farm-based source of income.

Table 2. Impact of household gardening on food expenditure reduction

Variable	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree	Mean (SD)
Household gardening has reduced monthly expenses	85 (42.50%)	12 (6.00%)	1 (0.50%)	1 (0.50%)	1 (0.50%)	4.61±0.78

Variable	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree	Mean (SD)
I do not depend on market groceries because of my garden produce	85 (42.50%)	12 (6.00%)	1 (0.50%)	1 (0.50%)	1 (0.50%)	4.61±0.78
My food budget reduced since I started practicing home gardening	76 (38.00%)	19 (9.50%)	2 (1.00%)	1 (0.50%)	2 (1.00%)	4.70±0.66
I have easy access to food material when practicing home gardening	85 (42.50%)	55 (27.50%)	20 (10.00%)	35 (17.50)	5 (2.50%)	3.90±1.44
I utilize gardening produce as supplementary source of income	75 (37.50%)	55 (27.50%)	42 (21.00%)	50 (25.00%)	10 (5.00%)	3.58±1.26

Source: Authors' field survey and computation, 2025

4.3 Evaluation of Dietary diversity and home gardening (Objective 2, Hypothesis 2)

Table 3 showcases the relationship between food diversity and home gardening which satisfies the Second objective and Hypothesis $H_{ø2}$, 41.5% strongly agreed that home gardening meets their family nutritional and consumer needs at a mean (Sd) of 3.96 ± 1.12 which shows a positive agreement , 44.5% agreed that there is reduced reliance on market food when there is a home garden at a mean of 4.08, 48.5% strongly agreed that home garden contributes to their families during food shortage at a mean of 4.85, while 45% agreed that home garden contributes to dietary diversity at a mean of 4.15. This section shows that there is a strongly positive relationship between home gardening and food diversity, therefore we rejected the Hypothesis 2 ($H_{ø2}$). Oral, *et al.* (2022) asserts that home gardens play an important role in dietary diversity has it help in the cultivation of fruit, vegetables and cash crops. Oral, *et al.* (2022) emphasises on the benefit of home gardens on dietary diversity, as they help in multipurpose, they enable many households to eat or sell food during seasonal food scarcity. Thamilini, *et al.* (2019) maintains that organized home garden contributes to a family dietary intake which leads to better food consumption and micronutrients: Niacin, Vitamin(A&C), thiamine, folic acid, iron and calcium. Lutz, *et al*. (2021) agrees that dietary diversity alleviates food insecurity most especially with the frequent consumption of garden vegetables, deficiencies such iron deficiency anaemia, hookworm infection and other nutritional defects are lessened.

Table 3. Evaluation of Dietary diversity and home gardening

Variable	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree	Mean (SD)
Home garden product sufficiently meets my family's nutritional and consumer need	83 (41.50%)	65 (32.5%)	24 (12.00%)	18 (9.00%)	8 (4.00%)	3.96 ± 1.12

Variable	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree	Mean (SD)
There is reduced reliance on market food when there is a home garden	75 (37.50%)	89 (44.5%)	17 (8.50%)	15 (7.50%)	4 (2.00%)	4.08 ± 0.97
Home garden contributes to the family dietary consumption during food shortage	97 (48.50%)	82 (41.00%)	42 (21.00%)	11 (5.50%)	9 (4.50%)	4.85 ± 1.46
Home gardening contributes to dietary diversity	50 (25.00%)	90 (45.00%)	30 (15.00%)	20 (10.00%)	10 (5.00%)	4.15 ± 1.10

Source: Authors' field survey and computation, 2025

4.4 Perception of household gardeners (Objective3)

Table 4 evaluates the Perception of households on home gardening which affirms Objective 3. This reveals that 25% believe that home gardening saves their money at mean of 3.54, 30 % strong agreed that home gardening required professional knowledge at mean 3.4. Furthermore 40% agreed that they felt accomplished as home gardeners at a mean of 4.10, meanwhile 25% disagreed that home gardening was time consuming at mean 2.54 showing a neutral perception. The objectives show a highly positive perception about the home gardening and its possibilities in alleviating food insecurity. Ilo, *et al.* (2017) reveals that higher percentage of women had a better knowledge of indoor gardening in Ogun state as they view it as a source of food production.

Table 4. Perception of household gardeners

Variable	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Mean (Sd)
Growing my own food saves my money	60 (30.00%)	50 (25.00%)	40 (20.00%)	38 (19.00%)	12 (6.00%)	3.54 ± 1.26
Gardening requires professional knowledge	60 (30.00%)	50 (25.00%)	30 (15.00%)	30 (15.00%)	30 (15.00%)	3.40 ± 1.43
I feel accomplished as a gardener	60 (30.00%)	80 (40.00%)	30 (15.00%)	20 (10.00%)	10 (5.00%)	4.00 ± 1.10
Home gardening is time consuming	20 (10.00%)	40 (20.00%)	60 (30.00%)	50 (25.00%)	30 (15.00%)	2.85 ± 1.20

Source: Authors' field survey and computation, 2025

4.5 Regression model on food security (Objective 4, Hypothesis 3)

Table 5 showcases the Linear Regression model which is used to determine the relationship between: Home gardening participation, food security, monthly income and household size. Adjusted $R^2 = 0.41$ asserts 41% of FSI (Food security index), Home gardening participation is associated with 1.72 unit increase in FSI at constant $p<0.001$ income and household size. Larger households showed a sightly low

food security although the effect was insignificant with (p=0.18), meanwhile for every 10,000 naira increase in income, Food security index increases by 0.11 unit (p<0.0001). This section fulfils Objective 4: we therefore reject $H_{ø3}$ as there is a significantly positive relationship between Food Security, Home gardening participation, Monthly income and Household size.

Study by Oyekale, *et al*. (2017) shows an increase in Food security Index by unit of Income and other socio-demographics as age, marital status. Although study by Ayodeji, *et al.* (2024) shows an increased food insecurity level which was prevalent in rural households and was affected by factors such as cost of illness and socio-economic variables as education, income and sex of household head. Furthermore Okojie, *et al*. (2016) assessed the Food Security Index based on the Amount of Calorie intake of the households, which is indicates that the higher the calories per food item the higher the Food security index. Examining Okojie, *et al.* (2016), households with low daily calorie intake are considered as lacking food security. Study by Kazeem and Jamiu (2020) concludes that low food security is influenced by household size, gender, marital status, farm ownership while high food security is dependent on gender, marital status and access to credits.

Table 5. Regression model on food security

Variable	Coefficient (β)	Standard Error	p-value	CI (95%)
Intercept	2.95	0.48	<0.01	1.98,3.92
Home-gardening Participation	1.71	0.28	<0.01	1.17,2.27
Monthly Income	0.11	0.02	<0.01	0.01,2.27
Household size	-0.07	0.06	0.18	-0.18,0.06

Note. Adjusted R2 = 0.41, Df (199) F-statistic: 34.50 (p<0.001)
Source: Authors' field survey and computation, 2025

5. Conclusions

The study observed the role of home gardening as a panacea to food insecurity in Ogun state, meanwhile the outcomes highpoints the benefits of promoting home gardening, as it could be a high impact policy system for the improvement of food security. Financial intervention through home gardening may not be colossal, but it would make better economical improvements to households in Ogun state, moreover households with larger family size may not fully benefit from the consumption and financial proponents of home garden which is dependent on garden size. The state of food security in higher percentage of food security research is slightly similar to that in Ogun states as home gardening serves as key factor in the determinacy of food security.

Studies have revealed that home gardening plays a pivotal role in alleviating household food insecurity by creating household dietary diversity and serving as a supplementary source of income most especially to low-income households, the following recommendations are projected to harness the advantages of home gardening in Ogun state:

Exploration of diminishing returns on the incomes of food security: Diminishing returns would showcase how unified source of production leads to slight increase in output, which can be applied to the relationship of food security and income of home gardening practitioners, however during the early

stages of home gardening, food security might not have significant effect on the intensification of the household's financial prowess.

Integration of quality home gardening policy to maintain a sustainable effect: This would involve the development of inclusive policies that recognises home gardening as an essential component of food security. It would also include the involvement of training programmes that enables households with the knowledge of climate-smart techniques and sustainable gardening practices.

Promotion of training and awareness: Training of households on the importance of home gardening would focus on resource utilization, garden size selection and crop selection. This would be effective in areas where households are financially incapable, to help in developing techniques for maintaining limited gardening resources.

Provision of quality gardening inputs: This will ensure household's access to gardening materials such as Pesticide, fertilizers and quality seeds. This will also address problems like pest infestation and plant diseases which are adversaries of quality garden yield.

Through the application of these recommended strategies, Ogun state households can leverage home gardening as a permanent solution to food insecurity.

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