



Home Gardening, A Panacea for Sustainable Household Food Security: A Case Study Of Sence Agric Home Garden Club In Nigeria

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Abstract

The study evaluated the contribution of home gardening to household food security, using Sence Agric Home Garden Club as a case study. Simple random sampling was used to select a total of 93 respondents for the study. The data for the study was collected using a well-structured questionnaire. The data was analysed using descriptive statistics such as frequency, and percentages. Regression analysis was also used. The results showed that home gardening in the study area was female dominated (84.9%) and majority of the home gardeners were married (78.5%) and (34.4%) were within the ages of 31-40 years. Furthermore, (68.8%) had a household size of 1-5 persons and (97.8%) had tertiary level of education. The coefficient of multiple determination R^2 was 0.621, cost of garden inputs, years of experience, level of education and household size were significant at $p < 0.01$, $p < 0.05$, $p < 0.01$ and $p < 0.05$ respectively and positively influenced the level of garden output. The study identified relief from mental and emotional stress (95.7%), reduction in household food expenses (86%) and easy access to fresh produce (100%) as some of the social and economic benefits of home gardening in the study area whereas weeds pest and diseases (83.9%) Lack of space (63.4%) and Poor soil condition (51.6%) were identified as major constraints. Local vegetables such as fluted pumpkin, water leaves, okra, herbs (rosemary, basils, thyme, etc), tubers (yam, sweet potatoes) exotic vegetables (kale, lettuce, spinach) and fruit trees such as pawpaw, plantain, oranges, etc. were identified as crops grown by the respondents in the study area.

Keywords: Panacea, Home Gardening, Food Security, Household.

Introduction

The agricultural sector is an essential sector in Nigeria as most people rely on it for survival and food supplies but in recent times, there has been an increased level of insecurity in Nigeria, leading to food shortages and increased prices for available food stuff. Food security is a vital concept that includes both individual and national access to food supplies. The Food and Agriculture Organisation of the United Nations (FAO 1996) defined “food security as “when all people, always, have physical and economic access to sufficient, safe, and nutritious food to



meet their dietary needs and food preferences for active and healthy life”. The Northern part of Nigeria has been known to be the major producers of agro products and other food items but in recent times, crisis and other factors have led to a decline in food production and availability, leading to shortages in food supply. According to a report by the Farming Early warning system Network FEWS NET (2019), chronic and seasonal food insecurity persist in every part of Nigeria, resulting to high food prices, impact of conflict related to insurgency (especially in the Northeast), armed banditry, communal, pastoralist/farmer crisis, kidnapping, cattle rustling, and climate change (FEWS NET, 2020).

A report by the premium Times Magazine (2022), stated that “the **United Nations Food and Agriculture Organisation (FAO)** reported about 19.4 million people will face **food insecurity** across Nigeria between June and August 2022”. The report identified insecurity especially insurgency in the North-east states, mostly in Borno, Adamawa and Yobe, armed banditry and banditry in some North-west states such as Sokoto, Katsina, Zamfara and Kaduna States, as well as North-central states of Benue and Niger as key drivers to the upcoming food crisis. Also, it said high inflation in soaring food commodity prices, which could be associated with an economic downturn, will contribute to the hunger crisis. Food insecurity affects both rural and urban households and thus becomes a problem since rural households are characterised by having a larger number of members than urban households. At the household level, food security refers to the ability of the household to secure, either from its own production or through purchases, adequate food for meeting the dietary needs of all members of the household. (FAO, 2010).

In recent years there has been an increased interest to strengthen and intensify local food production to mitigate the adverse effect of global food shocks and food price volatilities hence families are beginning to adopt home gardening to improve household food security. Globally, home gardens have been documented as an important supplemental source contributing to food and nutritional security and livelihoods. 'Food production on small plots adjacent to human settlements is the oldest and most enduring form of cultivation (Niñez1987).



In the past, most homes had small portions at their backyards where vegetables, fruit trees, tuber crops and even animals such as chickens and goats were raised for family consumption. Generally, home gardening is referred to the cultivation of a small portion of land which may be around the household plot or within a walking distance from home (Odebode, 2006). According to Galhena *et al*(2013), home gardening refers to the cultivation of a small portion of land which may be around the household or within walking distance from the family home and they are a time-tested local strategy that are widely adopted and practiced in various circumstances by local communities with limited resources and institutional support.

Oladele *et al* (2020) reported that home gardening contributes to the nutrition and household food security by providing quick and direct access to different foods that can be harvested, prepared, and eaten by family members on daily basis. Household with gardens obtain more than half of their supply of vegetables and fruits including secondary staple foods such as plantain, cassava, cocoyam, sweet potato, yam, medicinal plants, herbs and rearing of animals for their animal protein. Oftentimes marketing of garden produce and animals are often the only sources of independent income for women.

People practise gardening on small patches of homestead land, vacant lots, roadsides, or edges of a field, or in containers. Gardening may be done with virtually no economic resources, using locally available planting materials, green manures, "live" fencing and indigenous methods of pest control. Thus, home gardening at some level is a production system that the poor can easily enter. (Marsh 1998). Baiphethi and Jacobs (2009)stated that in the past, rural inhabitants used to be dependent on their own produced food and other farm activities which dominated their livelihoods, while urban inhabitants were characterised by purchasing their food from the markets. According to Degefa, *et al* (2021) home-grown food (food production in the backyard) has been increasingly practiced in countries of the world owing to many reasons including the increasing demand for fresh food materials, consumers' awareness of food-health nexus, and the increasing public awareness of environmental impacts of food production at home and resource-saving, the need for continued attachment to nature and heritage. There is an emerging trend of urban agriculture.



A well-developed home garden has the potential, when access to land and water is not a major limitation, to supply most of the non-staple foods that a family needs every day of the year, including roots and tubers, vegetables and fruits, legumes, herbs and spices, animals and fish. (FAO 2010). The broad objective of the study is to evaluate home gardening as a panacea for sustainable household food security, a case study of Sence Agric Home Garden Club.

The specific objectives were to:

- i. describe the socio-economic characteristics of the home gardeners,
- ii. examine the contribution of home gardening to household food security,
- iii. analyse the factors affecting home garden output,
- iv. identify the types of crops raised in the home gardens,
- v. identify the constraints of home garden farming.

Methodology

3.1. Study Area

The study on Home Gardening as a panacea for sustainable household food security was carried out in the Sence Agric home garden club, because this club has one of the highest numbers of home gardeners (over 240 members) from the North, South, East and Western parts of Nigeria.

Sence Agric home garden club is an online gardening community with its physical office and headquarters located in Lagos State. The club supports the UN Sustainable Development Goals (SDGs), especially goals 1 and 2 No Poverty and Zero Hunger respectively and believe that one way to positively impact the goals sustainably is through the development of home gardens as the home garden program encourages individuals and families to develop gardens at home irrespective of the space available to them with a goal of reaching 1.5m individuals and families by 2023.

3.2. Sampling Procedure and Sample Size



The population for the study comprised of home gardeners from the Sence Agric home garden club. The club has a total of 241 members from virtually every part of Nigeria.

Simple random sampling was used to collect the sample and Taro Yamane method was used to determine the Sample Size from the population since the population size is already known.

Below is the mathematical formula of Taro Yamane,

$$S = N / 1 + N (e)^2$$

Where :

S= sample size required

N = number of people in the population

e = allowable error (%) (it could be 0.10, 0.05 or 0.01)

Using the formula, our n =

$$241 / 1 + 241 (0.05)^2$$

$$= 241 / 1 + 241 \times 0.0025$$

$$= 241 / 1 + 0.60$$

$$= 241 / 1.6$$

$$S = 150$$

Since the population is small, the sample size was reduced slightly using Finite Population correction for proportions. Below is the formula,

$$n = s / 1 + (s-1)/N$$

where:

n= sample size



N = population size

$$n = 150 / 1 + \sqrt{150 - 1} / 241$$

$$= 150 / 1 + 0.61$$

$$= 150 / 1.61$$

$$= 93 \text{ respondents}$$

The sample size used for this study was 93 home gardeners.

Data Collection

Primary source of data was collected using a well-structured questionnaire was administered to respondents.

Data Analysis

Objectives 1 the Socio-economic characteristics of home gardeners, Objective 2 the social and economic benefits of home gardening, Objective 4 the types of crops raised and Objective 5 the constraints of home garden farming were analysed using frequency distribution table, and percentages while Objective 3 the factors affecting home garden output was analysed using Ordinary least squares regression model.

Models Specification

3 Ordinary Least Squares Regression (OLS)

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6 + e)$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5$$

$$+ \beta_6 X_6 + e$$

Where, Y = Level of home garden output (in kg)

X₁ = Cost of garden inputs (Naira)



X_2 = experience of gardeners (years)

X_3 = size of garden (plot)

X_4 = Level of education (in years)

X_5 = Household size (No. of persons)

X_6 = Labour (man/hour)

e= error term

Results and Discussion

Table 4.1. Socio-economic characteristics of home gardeners

Socio-economic variables	Frequency (n=93)	Percentage (%)
Age		
< 30	26	27.9
31-40	32	34.4
41-50	24	25.8
50-60	8	8.6
60>	3	3.2
Total	93	100.0
Sex		
Female	79	84.9
Male	14	15.1
Total	93	100.0
Marital Status		
Married	73	78.5
Single	20	21.5
Total	93	100.0
Household Size		
1-5	64	68.8
6-10	29	31.2
Total	93	100.0
Educational Status		
No formal Education	0	0
Primary	0	0
Secondary	2	2.15
Tertiary	91	97.8
Total	93	100.0
Gardening Experience		



<1yr	2	2.2
1-5yrs	70	75.2
6-10yrs	17	18.3
>10yrs	4	4.3
Total	93	100.0
Labour		
Family	44	47.3
Paid	6	6.5
Both	43	46.2
Total	93	100.0
Garden Size		
Small(< ½ plot)	71	76.3
Medium (½ - 1 plot)	22	23.7
Large (> 1 plot)	0	0
Total	93	100.0
Location		
Abuja	13	14
Akwa Ibom state	1	1.1
Anambra state	6	6.5
Bayelsa state	2	2.2
Delta state	2	2.2
Enugu state	1	1.1
Gombe state	1	1.1
Imo state	1	1.1
Kaduna state	1	1.1
Kano state	1	1.1
Lagos state	35	37.6
Nasarawa	1	1.1
Ogun state	1	1.1
Oyo state	3	3.2
Plateau state	2	2.2
Rivers state	22	23.7
Total	93	100.0

Source: Field Survey, 2022.

Table 4.1. shows the analysis of the relevant socio-economic characteristics of home gardeners in the study area was done in respect to age, sex, marital status, household size, level of education, gardening experience, size of garden, type of labour adopted and the location of the gardeners in the study area.

Majority of respondents (34.4%) were between age 31-40 followed by those within the age bracket <30 (27.9%) while those within age41-50, 50-60 and above 60 were 25.6%, 8.6% and



3.2% respectively, implying that majority of the home gardeners were in their active working years. This agrees with the findings of Oladele et al (2020) who reported that 65% of home gardeners in Igabi Local government area Of Kaduna State Nigeria, were within age range 31-40 years of age. 84.9% of the respondents were females while 15.1% were males, implying that home gardening in the study area is female dominated which further implies that women play an important role in ensuring the food security of their households. This is in consonance with the findings of Olajide-Taiwo et al (2010) who reported that more females (53.7%) of home gardeners in the National Horticultural Research Institute (NIHORT) neighbourhood were females as an indication that women were concerned with household food security and preparation but this is in contrast with the findings of Oladele et al (2020) who reported that 65.83% of home gardeners in Igabi Local government area of Kaduna State Nigeria, were males which could be due to the traditional belief that prohibits women in the study area from interacting and engaging freely in economic activities. Also, 78.5% of the respondents were married while 21.5% were singles. This means a vast majority of the home gardeners in the study area were married implying that most of the respondents are responsible adults. This agrees with the findings of Olajide-Taiwo et al (2010) who reported that 90.5% of respondents in the National Horticultural Research Institute (NIHORT) neighbourhood were married implying that the respondents were matured adults saddled with marital responsibilities.

The household size of majority of the respondents (68.8%) had a household size of 1-5 persons while those with household size of 6-10 persons were 31.2%. This implies that a considerable amount of the labour requirements of the home gardeners can be sourced within the household. This agrees with the finding of Uzokwe et al (2016) who reported that majority (65%) of home gardeners in Delta North agricultural zone of Delta State, Nigeria had a household size of 2-5 persons. Majority of the respondents (97.8%) had tertiary level of education while 2.15% had secondary education implying that majority of the home gardeners in the study area were enlightened and could easily adopt new innovations and improved gardening practices. This agrees with the findings of Olajide-Taiwo et al (2010) who reported that 57% of respondents in the National Horticultural Research Institute (NIHORT) neighbourhood had tertiary level of education.



Also, majority of the respondents were in Lagos State (37.6%) and Rivers State (23.7%), (14%), (6.5%) and (3.2%) were located in Abuja, Anambra and Oyo state respectively implying that more people in the urban areas are adopting home gardening. More so, seventy-two (75.2%) of the respondents had 1-5 years gardening experience while (18.3%) (4.3%), (2.2 %) had 6-10years, above 10 years and less than 1 year gardening experience, respectively. This agrees with the findings of Uzokwe et al (2016) who reported that majority (50%) of home gardeners in Delta North agricultural zone of Delta State, Nigeria had 1-5years gardening experience. (47.3 %) of the respondents used family labour while (46.2%) and (6.5%) used both family and paid labour and paid labour respectively. Implying that family labour plays an important role in home garden production. This agrees with the findings of Yusuf (2018) who reported that in Khahutu village in Katsina State family labour was utilized in various crop production activities such as land preparation, weeding, etc. Majority of the respondents (76.3%) had small sized (less than ½ a plot) home gardens while (23.7%) had medium sized (1/2 -1 plot) home gardens. This is consonance with the findings of Guuroh et al (2014) who reported that greater number of households (43%) of households in Bieha District, Southern Burkina Faso, cultivated home gardens that fall within the small category. Medium land holders were the next highest (35%)

Table 4.2. Contribution of Home Gardening to Household Food Security

Frequency Distribution on the Contribution of Home Gardening to Household Food Security

Indicators	Frequency	Percentages (%)
Home gardening produce	88	94.6
Contribute to household food needs		
All produce are sold out	0	0
Part of the produce are given out as gift	68	73.1
Produce reduce starvation during food scarcity	38	40.9
Social Benefits		
Recreation (Pleasure and relaxation)	70	75.2
Relief for mental and emotional stress	89	95.7
Environmental benefits	65	69.9
Economic Benefits		
Income generation	35	37.6
Reduction in household	80	86



food expenses		
Easy access to fresh produce	93	100

Source: Field Survey, 2022.

Table 4.2. above showed that (94.3%) of the respondents indicated that home garden produce contributed to household need while (73.1 %) indicated that part of home garden produce were given as gift and (40.9%) of the respondents reported that home garden produce reduced starvation during periods of food scarcity. This implies that home gardening is a sure way to improve food security at the household level. This agrees with the findings of Jana et al (2015) who reported that the home gardens surveyed in the Paschim Medinipur District of West Bengal in India contributed significantly to providing the consumption needs of vegetables, meat, and eggs for the households. Table 4.2. also showed the social and economic benefits of home gardening in the study area. Amongst the social benefits, (95.7%) of the respondents indicated that home gardening relieved mental and emotional stress while (75.2%) and (69.9%) of respondents respectively indicated that home gardening was a form of recreation and it also provided environmental benefits. For the economic benefits of home gardening, (100%) of the respondents indicated access to fresh produce while (86%) and (27.6 %) indicated reduction in household food expenses and income generation respectively as some of the economic benefits derived from their home gardens. This implies that home gardening contributes to the physical, mental, and emotional wellbeing. It also helps families cut down on their food expenses and acts as a source of extra income for homes. This agrees with the findings of Kelechi et al (2014) who reported in their study that (45%), (20%), (30%), and (38%) of respondents used homes gardening as a form of recreation, easing of emotional stress, relief of mental fatigue and environmental benefits respectively. They further reported that 81.7%, 70% and 28.3% of respondents used home gardening as a source of fresh vegetables, reduction of family food budget and a means of income generation respectively.

Table 4.3. Factors Affecting Home Gardening Output

Regression result				
Variables	Coefficient	Std.Err	t	p<[t]
Constant	-706.999	1490.310	-0.474	0.636



Cost of garden inputs	1.116	0.115	9.682	0.000***
Experience (inyears)	214.326	95.845	2.236	0.028**
size of garden (plot)	-3.244	396.246	-0.008	0.993
Education	1023.762	378.034	2.708	0.008***
Household size	257.071	139.663	1.841	0.069*
Labour	-367.949	317.346	-1.159	0.249
R ²	0.621			
R ² adjusted	0.595			
F	23.485			

Source: Field Survey, 2022; Note: Significance: *10%; **5%; *1%**

Ordinary Least Squares was used to analyse the factors that affect home garden output. Table 4.3. showed the results of the regression. The coefficient of Multiple determination R² was 0.621 indicating that 62.1% of the variable in home garden output was explained by the independent variables. Cost of garden inputs, level of education, experience in years and household size were positive and significant at 1%, 1%, 5% and 10% respectively. A positive relationship exists between cost of garden inputs and garden output. This implies that the higher the cost incurred in purchasing garden inputs such as seeds, manure, etc., the higher the garden output. This agrees with the findings of Meyo & Egoh, (2020) who reported that high unit cost of maize seeds (hybrid seeds) leads to high maize production. A positive relationship exists between level of education and garden output meaning that as the home gardeners become more educated and enlightened, they can easily adopt new innovations and improved practices which will in turn lead to increased garden output. This agrees with the findings of Nduwku (2010) who reported that that farmers with higher educational level tend to be efficient economically.

Experience in years was also positive implying that as the home gardeners gain more gardening experience, they improve their production and gardening output. This agrees with the findings of Idumah et al (2020) who reported that farmers with higher number of years of farming experience are likely to produce higher yields than those with fewer years of experience. This may not be unconnected with the fact that farmers with higher number of years of farming experience might have experimented with different crop combination practices to ascertain what types of arable crops can perform better and produce higher yield. A positive relationship exists



between household size and garden output, this implies that the larger the household size, the greater the output because a larger household size will provide more labour which will in turn improve garden output and productivity. This contrasts with the findings of Ndukwu (2010) and Okike (2000) who respectively reported that the smaller the household size, the more economically efficient the farmer becomes. In a situation where the household size is large, probably made up of mainly aged and very young people, a small proportion of farm labour will be derived from it, then inefficiency effects are expected to be greater.

Types of Crops Raised

Table. 4.4. Frequency Distribution of Types of Crops Raised by Respondents

Crop type	Frequency	Percentage
Local vegetables (Fluted pumpkin, water leaves, okra, etc)	89	95.7
Exotic vegetables (Lettuce, kale, spinach, etc)	43	46.2
Herbs (basils, rosemary, thyme, etc)	69	74.2
Tubers (yams, sweet potatoes, etc)	48	51.4
Fruit trees (pawpaw, plantain, mango, orange, etc)	60	64.5
Ornamentals (flowers)	15	16.2

Source: Field Survey, 2022.

Table 4.4 shows that majority of the home gardeners (95.7%) grow local vegetables while (74.2%), (64.5%), (51.4%) and (46.2%) grow herbs, fruit trees, tubers, and exotic vegetables respectively. This implies that home gardens afford the gardeners a wide range fruits, vegetables, herbs, and tubers to meet their family's food and nutritional needs. Olajide-Taiwo (2010) reported that about 36 plants were planted in the gardens at the in the National Horticultural Research Institute (NIHORT) neighbourhood.

Constraints Faced by Home Gardeners



Table 4.5. Percentage Distribution and Ranking of Constraints Faced by Home Gardeners

Constraint	Percentage (%)	Rank
Weeds pest and diseases	83.9	1
Lack of space	63.4	2
Poor soil condition	51.6	3
High cost of inputs	48.4	4
Destruction by pets	43	5
Climate change	31.2	6
Lack of capital	26.9	7
Lack of access to information	16	8
Theft	10.8	9

Source: Field Survey, 2022.

Table 4.5. showed the constraints the respondents encountered in their home gardens, majority of the home gardeners indicated that weeds, pests, and diseases (83.9%), lack of space (63.4%), poor soil condition (51.6%) were major constraints. Other constraints identified includes high cost of inputs, destruction by pets, climate change, lack of capital, lack of access to information, and theft. Oladele et al (2020) identified pests and disease infestation as a major constraint. Olajide-Taiwo et al (2010) identified pest attacks, disease infestations and lack of good quality planting materials as major constraints.

Conclusion

Home gardening was dominated by female in the study area and majority of the gardeners were married and had tertiary level of education with a household size of 1-5 persons. Relief from emotional and mental stress, access to fresh produce and reduction in household food expenses were some of the social and economic benefits identified in the study.

The study also identified cost of garden inputs, household size, level of experience and education as factors that influence garden output. Weeds, pests and diseases, lack of space and poor soil condition were some of the constraints identified in the study.

Recommendations

The study recommended that Government should encourage home garden level of production by providing inputs such as seeds, tools etc at subsidized rates for home gardeners. The government and non-governmental agencies should partner with garden clubs and other agricultural extension agencies to sensitise individuals and households on the benefits of home gardening in enhancing food security.

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