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Strategies for enhancing food security and poverty status among women food entrepreneurs in Ido Local Government of Oyo State, Nigeria

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ABSTRACT

Despite global advancements, food insecurity and poverty persist as critical issues, particularly among rural women engaged in food vending. Thus, this study explores the socio-economic factors affecting food security and poverty among women food vendors in Ido Local Government Area, Oyo State, Nigeria. Utilizing primary data collected through a detailed questionnaire from 120 respondents, this research employs descriptive statistics, the Foster-Greer-Thorbecke (FGT) index, household food security index, and logistic regression models to analyze the data. The findings indicate that 67.4% of the vendors experience varying degrees of poverty, with the majority struggling to meet basic and extended socioeconomic needs. In terms of food security, 64.8% of vendors were classified as food secure, demonstrating a capacity to meet their dietary needs effectively. Key determinants influencing both food security and poverty status included household size, income, access to credit, and cooperative membership, among others. Moreover, the study revealed that women employ multiple strategies to cope with poverty and food shortages, including diversifying income sources and engaging in both farming and non-farming activities. Surprisingly, very few utilized credit facilities or government support, and none accessed technical assistance or training. This research underscores the need for targeted interventions to support these women, suggesting enhanced access to credit, nutritional education, and cooperative developments to improve their poverty status and food security. By addressing these issues, the study contributes to the broader goal of sustainable development in the region, providing a foundation for policy recommendations aimed at improving the livelihoods of women food vendors in rural Nigeria.

Keywords: Food security, Gender, Poverty status, Women vendors, Nigeria

1. INTRODUCTION

Food security is the condition in which every person continuously has access to enough safe, nourishing food to meet their nutritional needs for a healthy life at all times, according to the Food and Agriculture Organization. Despite its recognition as a fundamental human right, countless individuals still face hunger and malnutrition worldwide, driven by factors like poverty, conflict, and the impacts of climate change. There has been a rising global consciousness about food insecurity recently, prompting numerous researchers to explore potential solutions. Several studies, including Barrett et al., (2009), have highlighted the importance of improved market access in boosting the availability of diverse food options for households, while Wiggins and Keats, (2022) noted that enhancing agricultural practices among smallholder farmers is crucial for decreasing community undernutrition.

Research on the role of local government policies in shaping public attitudes toward food security initiatives is scant. Such policies are pivotal as they influence agricultural productivity and development planning, which in turn affect a household's ability to procure sufficient nutritious food. Poverty encompasses issues such as inadequate finances, malnutrition, and low social status, especially in rural areas. The 1990s saw a significant increase in poverty rates among women, rising by 50%, compared to a 30% increase for men, highlighting gender-specific economic disparities. Women's earnings from agriculture and related sectors are vital for community and family welfare but are often limited by cultural, economic, and social barriers.

In Nigeria, many rural female food vendors, who predominantly live in poverty due to harsh rural conditions, are left to fend for themselves as men migrate to urban areas. These women face challenges such as overwork, low productivity, and restricted access to essential resources like loans, land, and agricultural training. Effective and sustainable programs targeting women are essential for improving their living standards through better agricultural productivity and access to information. However, past initiatives have often failed to properly engage their target demographic or suffer from inadequate coordination among supporting institutions. The National Special Plan for Food Security (NSPFS) was designed to enhance food security and reduce poverty for both genders by supporting increased agricultural output and resource management. This program's outcomes need continuous evaluation to refine strategies aimed at improving living conditions.

This study investigates the food security and poverty levels among women food vendors in Ido Local Government Area, Oyo State, Nigeria. It explores socio-economic factors, poverty rates, food security conditions, and the strategies employed to alleviate poverty among these women. Despite various efforts by governmental and non-governmental organizations, little is known about the specific hardships faced by these women, which complicates the development of targeted interventions. The research aims to uncover the unique challenges faced by women's food vendors in this region and devise effective solutions to enhance their food security and economic stability. Addressing the food security and poverty challenges in developing regions like Nigeria, where women's food vendors are exceptionally vulnerable, is critical for sustainable development. This study's results will be pivotal in informing evidence-based strategies to improve the welfare of these women, ultimately fostering a more prosperous and healthy society.

2. MATERIALS AND METHODS

The research took place in Oyo State's Ido Local Government Area, which is situated in the southwest of the country. This area, one of 33 local government districts in the state, encompasses about 986 square kilometers and is home to approximately 200,000 residents as per the 2006 census. The district's administrative center is in the town of Ido, and it includes other communities such as Eruwa, Igbojaye, and Omi-Adio. Geographically, the area is positioned at approximately 7.5252°N latitude and 3.9217°E longitude. Predominantly agrarian, the local economy thrives on agriculture, with residents primarily engaged in growing yams, cassava, maize, and various vegetables. Also, women's food vendors were interviewed and a comprehensive questionnaire was used to gather primary data for this study. The questionnaire gathered detailed socio-economic data from participants, including age, gender, marital and farming status, association memberships, educational backgrounds, farm sizes, and their access to financial resources. The sampling method employed was a multi-stage technique.

Initially, the Ido Local Government Area was intentionally chosen for its significant agricultural output. Subsequently, six communities known for their high concentration of food vendors were selected. From these, 20 women food vendors in each community were chosen, culminating in a total of 120 participants. Data were analyzed using several statistical tools, including Descriptive statistics, the Household food security index, the Foster-Greer-Thorbecke (FGT) weighted poverty Index, and Logit

Regression models. The FGT index, specifically, helped assess the poverty levels among the food vendors by evaluating poverty incidence, gap, and severity, with different weights assigned to the extent a household or individual falls beneath the poverty line. The index is calculated using the formula provided below (Foster et al., 1984):

$$PI\alpha = 1/u \sum[L - I/L]\alpha$$

Here, the poverty line (L), poor number (u), per capita expenditure (I), and poverty index (α): it could be 0, 1, and 2 values.

L is the summation of household income divided by sample size.

If $\alpha = 0$, the index becomes Headcount Ratio or Poverty Incidence (PIo = Headcount/sample size). It can be seen as the percentage of the population living in poverty. The number of households with per capita incomes below the poverty line is ascertained using it.

If $\alpha = 1$, the Poverty Gap or Dept Index. It measures the entire amount of income that households experience falling short of the poverty line (L). It calculates the discrepancy between the actual income and the minimum income necessary to avoid poverty. The percentage of the poverty line that the typical disadvantaged household must cross to meet the threshold is known as the "poverty depth". A lower value for the depth of poverty indicates a narrower gap between the two, indicating a lower level of poverty at any given time (Olutumise and Ajibefun, 2019).

Food Security Index

It was estimated given this formula by (Omonona and Agoi, 2007; Ajayi and Olutumise, 2018). The two-thirds approach of per capita food expenditure for households was used for the food security benchmark. It is food secure household if the value is greater than 2/3 of the index, and food insecure when it is lesser.

Logit Regression Model

The logit regression model was utilized to examine the factors influencing the food security and poverty status of female food vendors. The binary logistic regression approach has been widely used in various studies across agriculture, that require investigating and forecasting outcomes that are dichotomous.

It is expressed implicitly as thus;

$$Pi = f(xij, \mu i)$$

Where $Pi = ln = f1/1 - f1$,

P1 = food security status (1 if food secured, 0 if otherwise);

P2 = poverty status (1 if Poor, 0 if otherwise)

Xij = vector of independent variable;

βi = coefficients to be predicted,

μi = error term.

Explicitly represented as,

$$Y = ß0 + ß1X1 + ß2X2 + ß3X3 + ß4X4 + ß5X5 + ß6X6 + ß7X7 + ß8X8 + ß9X9 + ß10X10 + ß11X11 + ß12X12 + ß13X13 + \mu$$

X1 = Marital status (1- married, 0-otherwise),

X2 = Age in years

X3 = Family size (Numbers);

X4 = Food selling experience (Years)

X5 = Income (Naira)

X6 = Credit Access; (Yes=1, No=0)

X7 = Cooperative Membership (Yes=1, No=0)

X8 = Property ownership; (1- Yes, 0- otherwise),

X9 = Education; (1= educated and 0, otherwise),

X10 = Amount spent on food per month; (Naira),

X11 = Frequency of meals per day (Number),

X12 = Presence of other income; (1- Yes, 0- otherwise),

X13 = Gender (1 – male, 0- female)

μ = error term.

3. RESULTS AND DISCUSSION

Demographic Characteristics of Food Vendors

The data presented reveals that 17.5% of the surveyed food vendors were under 30 years old, while a majority of 54.17% fell within the 31 to 40 age range (Table 1). A smaller portion, 5.83%, were aged between 41 and 50, and 22.5% were over 50. The average age was calculated at 39.6 years. This age distribution suggests that many vendors are in their prime working years, which the Food and Agriculture Organization Ajayi and Olutumise, (2018) identifies as between 30 and 50 years, potentially enhancing productivity. Regarding marital status, 29.2% of vendors were single, 61.7% were married, and 9.2% were divorced. The prevalence of married vendors suggests a possible availability of familial labour, which is crucial in food vending operations. Marital status is also linked to household size, with singles possibly more reliant on hired help.

According to Alabi et al., (2023), marital status significantly impacts production decisions, possibly affecting food security and poverty alleviation. Educational attainment among the vendors showed that 34.2% had primary education, 47.5% had secondary education, and 18.3% had tertiary education. This distribution indicates that most vendors have basic to moderate education, which could influence operational efficiency. This shared the same view with the findings of (Ijigbade et al., 2023; Olutumise et al., 2024). The analysis of household sizes revealed that 70% of vendors had households of 1 to 5 people, 27.5% had households of 6 to 10, and a small group of 2.5% had more than 10 people in their households.

The average household consisted of 4 individuals, indicating a moderate size that could provide additional family labour for food vending. The result is consistent with the findings of (Badamosi et al., 2023). Experience levels among the vendors showed that the vast majority, 81.67%, had 5 years of experience or less, while 18.33% had been in the industry between 6 and 10 years. This suggests that most vendors are relatively new to the market, which could reflect on their selling proficiency. Lastly, access to credit was widespread, with 84.17% of vendors having the ability to obtain financial support, while only 15.83% lacked such access. This widespread availability of credit is likely a significant factor enabling vendors to sustain and expand their operations, thereby potentially improving food production and reducing poverty in the area.

Table 1 Distribution by the socioeconomic variables

Socioeconomic variables	***Frequency***	***Percentage***	***Mean***
Age			
Below 30	21	17.5	-
31-40	65	54.17	39.6
41– 50	7	5.83	-
Above 50	27	22.5	-
Marital Status			
Single	35	29.2	-
Married	74	61.7	-
Divorced	11	9.2	-
Education levels			
Primary	41	34.2	-
Secondary	57	47.5	-
Tertiary	22	18.3	-
Household Sizes			
1-5	84	70.0	4
6-10	33	27.5	-
Above 10	3	2.5	-
Experience			
≤ 5	98	81.67	-
6-10	22	18.33	-

Credit Access			
Yes	101	84.17	-
No	19	15.83	-
Total	120	100	-

Women Food Vendors' Poverty Status in the Study Areas

The average per capita household expenditure (MPCHE) for women food vendors varies, with amounts less than N1,252.42 for those classified as extremely poor, between N1,252.42 and N1,994.32 for the moderately poor, and over N1,994.32 for those who are not considered poor. According to the data presented in Table 2, 32.6% of the women's food vendors fall into the non-poor category, with expenditures surpassing N1,994.32. This group, representing a third of the sample, is financially stable enough to meet both basic and additional socioeconomic family needs.

In contrast, 20.8% of the vendors are extremely poor, with expenditures below N1,252.42, indicating severe financial struggles that hinder their ability to provide for their family's fundamental necessities. The majority, or 46.6%, are moderately poor, with spending between N1,252.42 and N1,994.32. While not impoverished, this group faces challenges in meeting some of their families' broader socioeconomic needs. The result is similar to the findings of (Olutumise and Ajibefun, 2019).

Table 2 Distribution of Poverty Status of the Respondents

Poverty Group	MPCHE(N)	Frequency	Percentage
Extremely Poor	1,252.421	25	20.8
Moderately Poor	1,252.421≤1,994.32	56	46.6
Non-Poor	>1,994.32	39	32.6

Women Food Vendors' Food Security Status

This section details the food security status of women's food vendors in the designated study area. According to the data shown in Table 3, the total food expenditure for these vendors amounted to ₦3,241,526. This figure was calculated by dividing the total household food expenditure by the household size, resulting in the total per capita food expenditure. The average per capita food expenditure came to ₦27,012.7, derived by dividing the total per capita expenditure by the number of participants (n=120).

Moreover, the food security index was determined as 1.8 by dividing the per capita food spending by two-thirds of the average per capita food expenditure, which was determined to be ₦18,008 by multiplying the per capita food expenditure by two-thirds. Approximately 35.2% of the vendors were categorized as food insecure, whereas a significant majority of 64.8% were considered food secure. The average food security index of 1.8 among the participants indicates a general state of food security. This aligns with the study by Ganiyu and Omotayo, (2016), which found that most farming households in Nigeria are food secure. The result is contrary to the findings of (Adegoroye et al., 2021; Ogunyemi et al., 2022).

Table 3 Distribution of Food Security Status of the Respondents

Status	Frequency	Percent
Food Insecure	42	35.2
Food Secured	78	64.8
Total	120	100.00
The sum of Food Expenditure	₦3,241,526	-
Per capita Food expenditure	₦27,012.7	-
2/3 mean Per capita Food expenditure	₦18,008	-
Z (Food Security Index)	1.8	Food secured

Determinants of Food Security and poverty status among the Women Food Vendors

Determinants of Food Security among the Women Food Vendors

This section discusses the findings of a logistic regression analysis that examined the socioeconomic factors affecting food security among women food vendors in the study area. The regression coefficient was 0.8201, suggesting that the independent variables explained 82% of the variance. The remaining 18% was attributed to the error term, with the overall model significant at the 1% level. A notable finding was the negative impact of household size on food security, where an increase in household members was associated with a 0.0347% decrease in food security, significant at the 10% level. This inverse relationship likely stems from increased food demand within larger households, contributing to food insecurity.

Conversely, income positively influenced food security; a unit increase in income was linked to a 0.0524% increase in food security, demonstrating that higher income allows for greater per capita food spending, thereby enhancing food security. This relationship held significant at the 1% level. Access to credit was another significant factor but showed a negative coefficient of -0.0231, indicating that increased access to credit might raise the likelihood of food insecurity by 0.0231%, a result significant at the 1% level (Table 4). This could suggest that the conditions or uses of credit are not effectively translating into improved food security. Membership in a cooperative had a positive effect on food security, with a coefficient of 0.0081, implying that being part of a cooperative can improve food security odds by 0.0081%, a finding that was significant at the 10% level. Cooperatives likely provide support systems that enhance member welfare.

The analysis also revealed that both the amount spent on food and the frequency of meals per day positively affect food security. Specifically, for each unit increase in food spending, food security probability improves by 0.0011%, and an increase in meal frequency per day enhances food security by 0.571%, with both coefficients significant at the 1% and 10% levels, respectively. Finally, having additional sources of income positively correlates with food security, where each unit increase in such income increases the likelihood of achieving food security by 0.0241%, a result that was significant at the 5% level. This supports the notion that supplementary income streams can buffer against food insecurity as also noted (Ajayi and Olutumise, 2018).

Table 4 Food Security Determinants among the Women Food Vendors

Variables	Coefficient	Standard Error	P value
Marital Status	0.0307	0.9121	0.621
Age	0.0232	0.0053	0.231
Household size	-0.0347*	-0.0019	0.021
Food selling Experience	0.0382	0.0017	0.416
Income	0.0524***	0.0045	0.001
Credit Access	-0.0231**	0.0586	0.010
Cooperative membership	0.0081*	0.2093	0.020
Property Ownership	0.0580	0.3090	0.461
Year of Education	0.0019	0.1569	0.510
Amount Spent on food per month	0.0011***	1.6183	0.001
Frequency of meal per day	0.5719	0.0030	0.011
Presence of other income	0.0241**	0.0901	0.002
Gender	0.0035	0.8591	0.450
Constant	0.0653	0.1630	0.001
LR chi^2 (8) = 9.46 Prob. > chi^2 = 0.0003 Log relationship = 125.185749 Adjusted R^2 = 0.8201	-	-	-

Dependent variable: Food security (Secure =1, and 0, otherwise) *represents a 10% significant level, **represents 5%, ***represents 1%.

Determinants of Poverty Status among Women Food Vendors

This part of the analysis delves into the logistic regression results examining the socioeconomic variables influencing the poverty levels of women's food vendors in the designated area. The regression coefficient was 0.6820, indicating that the independent variables—gender, age, household size, income, credit access, cooperative membership, marital status, monthly food expenditure, and additional income sources—explained 68% of the variance in poverty status. The remaining 32% was due to the error term, with the overall findings significant at the 1% level. Age showed a negative correlation with poverty, where each additional year in a vendor's age decreased their likelihood of being classified as poor by 0.0572%, significant at the 5% level. This suggests that older vendors are less likely to be poor, potentially due to accumulated resources or stability. This is similar to the findings of (Olutumise et al., 2022).

Conversely, income displayed a positive correlation with poverty, unexpectedly indicating that an increase in income raised the chance of being categorized as poor by 0.0930% (Table 5). This paradoxical finding, significant at the 1% level, might imply that higher income levels are not adequately reflected in the living standards or are offset by other factors. Credit access had a protective effect against poverty, with each unit increase in access to credit decreasing the likelihood of poverty by 0.0166%, a result significant at the 1% level. This indicates that credit is an essential tool for financial stability among these vendors. Cooperative membership, typically beneficial, here showed an unusual positive correlation with poverty status, increasing poverty likelihood by 0.0404% per unit increase in membership, significant at the 1% level.

This outcome may suggest inefficiencies or misalignments within the cooperative structures that need further investigation. Property ownership was another factor with an unexpected positive impact on poverty probability, where more property ownership was associated with a 0.2180% increase in the likelihood of being poor, significant at the 10% level. This could reflect liabilities or costs associated with property that outweigh its financial benefits. Finally, having an additional source of income was positively correlated with reduced poverty odds, decreasing poverty likelihood by 0.0271% with each unit increase, and was significant at the 1% level. This highlights the importance of diversified income streams for enhancing economic security among food vendors.

Table 5 Poverty Status Determinants among the Women Food Vendors.

Variables	Coefficient	Standard Error	P value
Marital Status	0.0011	0.1105	0.432
Age	-0.0572**	-0.0230	0.010
Household size	0.0840	0.0531	0.121
Food selling Experience	0.0542	0.2201	0.416
Income	0.0930***	0.0660	0.001
Credit Access	-0.0166***	-0.2990	0.002
Cooperative membership	0.0404***	0.1053	0.001
Property Ownership	0.2180**	0.0916	0.020
Year of Education	0.0442	0.2012	0.640
Amount Spent on food per month	0.8520	0.6201	0.211
Frequency of meal per day	0.1207	0.0440	0.111
Presence of other income	0.0271***	0.0129	0.000
Gender	0.0973	0.0172	0.210
Constant	0.0653	0.0030	0.000
LR chi^2 (8) = 6.62 Prob. > chi^2 = 0.0012 Log relationship = 1172.03181 Adjusted R^2 = 0.6820	-	-	-

Dependent variable: Poverty Status (Poor =1, and 0, otherwise) *represents a 10% significant level, **represents 5%, ***represents 1%.

The poverty alleviation strategies used by women food vendors in the area

Table 6 displays the responses from women's food vendors regarding their use of poverty alleviation strategies to manage poverty and food shortages. The data show that a significant majority, 93.3%, of the vendors reported employing various strategies to mitigate these challenges. In contrast, a small fraction, 6.7%, indicated that they did not adopt any specific measures to address poverty and food scarcity.

Table 6 Use of Poverty Alleviation Strategies

Poverty Alleviation Strategies	Frequency	Percentage
Yes	112	93.3
No	08	6.7
Total	120	100

Source: Field survey, 2023

Table 7 details the various strategies employed by women's food vendors to manage poverty and food shortages. It was shown in the results that the vast majority of vendors adopted multiple approaches: 94.6% diversified their income sources, 91.1% engaged in farming activities, and 87.5% participated in non-farming activities to mitigate these challenges. However, fewer vendors utilized other available resources; only 33.9% accessed credit facilities, and 19.6% used government relief support to address their financial and food security issues. Notably, none of the vendors reported using technical assistance or training programs as part of their strategies to overcome poverty and food scarcity.

Table 7 Poverty Alleviation Strategies Used

Poverty Alleviation Strategies	Frequency	Percentage (%)
Credit facilities	38	33.9
Government Palliative support	22	19.6
Diversification of income	106	94.6
Engagement in farming activities	102	91.1
Engagement in non-farming activities	98	87.5

4. CONCLUSION AND RECOMMENDATIONS

The study established that the women's food vendors were all females, married, physically, and economically active in age. They were experienced, educated, and had fair access to credit facilities for their food-selling activities. The study further concluded that the women's food vendors are moderately poor but can afford to buy food for their families. Also, the women's food vendors are food-secured. Household size, income, access to credit, membership of the cooperative society, the amount spent on food per month, frequency of meals per day, and presence of other income were the factors determining the food security of the women food vendors in the study area.

Also, age, income, credit access, membership of cooperatives, and presence of other income were the factors determining the poverty status, Finally, Diversification of income, and engagement in farming and non-farming activities were the coping strategies adopted by the women food vendors to cope with poverty and food shortage. Regarding the research study's findings, the following suggestions would significantly increase food security and decrease poverty among women's food vendors.

The government including stakeholders in the industry should facilitate more access to credit facilities amongst the food vendors to encourage and promote food security and reduce the poverty rate among Food vendors in the area.

The study recommends periodic promotion of nutrition and food protection training as well as capacity building on ways to combat poverty and food insecurity.

To enhance the food situation and financial stability of food sellers, the government should construct infrastructural amenities such as reliable power supplies, better drinking water sources, upgraded restrooms, and operational healthcare services.

Since cooperative societies can improve the food security status amongst members, an enabling policy environment should be put in place to encourage and promote the operations of cooperative societies.

Having found that diversification of income sources and engagement in farming and non-farming activities positively helped the food vendors' to cope with poverty and food security, therefore, human capital development, investment portfolios, and enabling marketing environment should be prioritized in policy formulation.

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Authors' Contributions

AEA conceptualized the idea, coordinated the process, reviewed the analysis, developed the content, and wrote the report.

Informed Consent

Oral informed consent was obtained from individual participants included in the study.

Ethical approval

Not applicable.

Conflicts of interests

The authors declare that there are no conflicts of interests.

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Data and materials availability

All data associated with this study are present in the paper.

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