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Research Article

Assessment of Gender Disparities on Access to Agricultural Resources in Ekiti State, Nigeria

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Abstract

This study assessed gender disparities on access to agricultural resources in Ekiti State, Nigeria. Specifically, the research analyzed the socio-economic characteristics of women farmers, identified the extent of gender-based differences in resource access, assessed the factors influencing women's access to agricultural resources, and evaluated how these disparities affect their livelihoods. Data were collected from sampled women farmers and analyzed using descriptive statistics, percentages, means, Probit regression, and OLS regression models. The findings revealed that the farmers are predominantly in their active and productive years, with an average age of 42.6 years, moderate household size of 6 people, and an average farming experience of 12 years. Most of the farmers are married (68.9%) and smallholders, cultivating an average farm size of 2.1 hectares. Although a fair proportion had at least primary (26.7%) or secondary education (33.7%), 20% of the respondents had no formal education. Result on gender disparities in accessing agricultural resources revealed that women face significant disadvantages in accessing land (46.7%), credit (40%), extension services (33.3%), farm inputs (46.7%), technology (44.4%), and markets (73.3%) compared to their male counterparts. The widest gaps were observed in land ownership, technology access, and market participation, confirming that systemic and institutional barriers continue to marginalize women in agriculture. The regression results further established that education, income, access to credit, extension services, membership in farm organizations, and access to market information were the most significant factors influencing farmers' access to agricultural resources. Also, the OLS result showed that disparities in education, land ownership, credit availability, market access, and technology adoption significantly undermine women's agricultural livelihoods. Conversely, access to these resources was positively and strongly associated with improved agricultural income and welfare.

Keywords

Assessment, Gender Disparities, Access, Agricultural Resources

1. Introduction

Agriculture remains a critical sector for livelihood sustenance and rural development in Nigeria, employing a large proportion of the population, particularly women. Women contribute significantly to food production, processing, and marketing, yet they continue to face systemic disadvantages in accessing productive resources. Recent studies indicate that

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gender inequality in agriculture reduces overall productivity and undermines national food security [1, 2]. In many rural communities, women supply between 60–70% of agricultural labour but control far fewer productive assets than men [3, 4]. These structural imbalances create productivity gaps that not only affect women's incomes but also limit household welfare and rural economic transformation.

Access to land remains one of the most pronounced areas of gender disparity in Nigerian agriculture. Customary land tenure systems, inheritance practices, and patriarchal norms frequently restrict women's ownership and control of farmland. Empirical evidence shows that female farmers are more likely to access land through male relatives and often cultivate smaller and less fertile plots compared to men [5, 6]. Furthermore, insecure land tenure discourages long-term agricultural investments such as irrigation, tree planting, and soil conservation [1, 7]. These constraints significantly reduce women's agricultural productivity and bargaining power within farming households.

Beyond land, disparities also exist in access to credit facilities, farm inputs, and extension services. Financial institutions often require collateral, such as land titles, which many rural women lack, thereby limiting their access to formal credit [2, 8]. Studies further reveal that women receive fewer visits from agricultural extension agents and have limited exposure to improved seeds, fertilizers, and mechanized technologies [4, 9]. This unequal access to information and productive inputs constrains women's ability to adopt modern farming practices and participate competitively in agricultural value chains.

Technological advancement and market integration have become increasingly important in modern agriculture, yet gender gaps persist in these areas. Digital agriculture, climate-smart innovations, and market information systems are expanding across Nigeria, but women often face barriers such as lower digital literacy, restricted mobility, and limited ownership of communication devices [10, 11]. In addition, women are underrepresented in agricultural cooperatives and decision-making platforms that facilitate collective bargaining and market access [4, 12]. These exclusions limit their capacity to benefit from emerging agricultural opportunities and reduce their resilience to climate and economic shocks.

Although several national and regional studies have examined gender inequality in agriculture, there remains a need for localized assessments that reflect specific socio-cultural and institutional contexts. Ekiti State, being predominantly agrarian, relies heavily on smallholder farming where women play central roles in crop production and processing. However, context-specific evidence on the extent and dimensions of gender disparities in access to agricultural resources within the state remains limited. Recent scholars emphasize the importance of state-level analysis to design targeted, gender-responsive agricultural policies [2, 13]. Therefore, assessing gender disparities in access to agricultural resources in Ekiti State is essential for informing inclusive development strategies and promoting equitable agricultural transformation.

2. Methodology

2.1. The Study Area

This study was conducted in Ekiti State, Nigeria. The State is one of the States in the South Western Region of Nigeria. The state is within the tropics. Ekiti State was created on the 1st of October, 1996 and comprises of 16 Local Government Area (LGAs). Ekiti State occupies land mass of approximately 6,6028 km^2 and a population of 2,432,321 (NPC 2006). It is predominantly an agricultural area whose main cash crops are cocoa, timbers, oil-palm and kolanuts. The food crops grown are cassava, yam, cocoyam and grain crops such as maize and rice. It has two main seasons i.e. the rainy season and dry season. The area is predominantly agrarian, with agriculture being the main source of their livelihood in the area. Tree crops cultivated include cocoa, mango, cashew, citrus, oil palm and arable crops cultivated includes maize, yam, cassava, cocoyam, tomatoes, and vegetables among others. The State has 16 Local Government Areas and three Agro Ecological Zones (AEZs) namely rain forest, derived savannah, and moist savannah zones.

2.2. Method of Data Collection

Primary data was used for the study. The data was collected using a well-structured questionnaire and was analyzed using descriptive statistics and inferential statistics. Descriptive statistics is concerned with the efficient methods of organizing, summarizing and presentation of statistical data, such as frequency counts, and percentages will be used.

2.3. Sampling Technique

A multi-stage sampling method was employed in the study. In the first stage, three Local Government Areas [LGAs] were purposely selected. These are; Irepodun/ Ifelodun, Ikole and Ekiti West. At the second stage, three communities were randomly selected from each of the 3 LGAs. Finally, at the community level, 10 respondents, comprising of 5 male farmers and 5 female farmers were randomly chosen from each of the communities, making ninety (90) respondents (i.e. 45 male farmers and 45 female farmers) for the study.

2.4. Analytical Techniques

The data collected were analyzed using descriptive statistics, Probit regression model and Ordinary Least Square.

2.4.1. Descriptive Statistics

This was used to analyze data on socio-economic gender-

based differences on resources access. This includes the mean, frequency distribution, variances, percentages and standard deviation.

2.4.2. Probit Regression Analysis

To examine the factors influencing women's access to agricultural resources in the study area, Probit regression model was used. The Probit is used to model dichotomous or binary outcome variables. In the Probit model, the inverse standard normal distribution of the probability is modeled as a linear combination of the predictors. Explicitly, this is stated as follows.

$P^1 = \beta Xi + \mu_i$ that is $P^1 = f$ (Age, level of education etc.)

Algebraically expressed as

$$P^1 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \ldots\ldots\ldots\ldots \beta_n X_n + \mu_i$$

Where P^1 = probability function

P^1 (Y=1) = Access to agricultural resources (yes =1 otherwise = 0)

Where:

X_1, X_2… Xn = independent variables

β0 = intercept or constant term

β1, β2… βn = coefficients of the independent variables

ε = error term

While the independent variables are hereby listed

X_1 = Age (years)

X_2 = Marital status (single = 1, married = 2, widowed = 3, separated =4)

X_3 = Level of education (no formal education = 0, primary education = 1, secondary education = 2, tertiary education = 3)

X_4 = Household size (number)

X_5 = Level of income (Naira)

X_6 = Membership in farm organization (yes =1 otherwise = 0)

X_7 = Number of dependents (number)

X_8 = Access to credit (yes =1 otherwise = 0)

X_9 = Access to information (yes =1 otherwise = 0)

X_{10} = Availability of resource (yes =1 otherwise = 0)

X_{11} = Occupation (farming = 1, trading = 2, civil service = 3, artisanal jobs = 4)

X_{12} = Access to extension service (yes =1 otherwise = 0)

2.4.3. Ordinary Least Squares

To examine how gender disparities in access to agricultural resource affect the women's livelihoods, Ordinary Least Square was used. Ordinary Least Squares (OLS) is a statistical method used to estimate the relationship between a dependent variable and one or more independent variables. It aims to minimize the sum of the squared errors between observed and predicted values.

The OLS equation can be written as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta n X n + \varepsilon$$

Where:

Y is the dependent variable i.e. Output value (Naira)

X_1, X_2… Xn are the independent variables (predictor variables)

β_0 is the intercept or constant term

β_1, β_2… βn are the coefficients of the independent variables

ε is the error term (residual)

While the independent variables are;

X_1 = Age (years)

X_2 = Household size (number)

X_3 = Level of education (no formal education = 0, primary education = 1, secondary education = 2, tertiary education = 3)

X_4 = Farming experience (year)

X_5 = Land ownership (yes =1, otherwise = 0)

X_6 = Land tenure security (yes =1, otherwise = 0)

X_7 = Size of landholding = (Ha)

X_8 = Availability of credit (yes =1, otherwise = 0)

X_9 = Market access (yes =1, otherwise = 0)

X_{10} = Access to technology (yes = 1, otherwise =0)

X_{11} = Access to markets (yes = 1, otherwise =0)

X_{12} = Market information (Naira)

3. Results and Discussion

3.1. Socio-Economic Characteristics of Women Farmers

The socio-economic characteristics of the respondents provide insights into their demographic and farming profile. The average age of the women farmers was 42.6 years, indicating that the majority are in their economically active years. About 35.6% of the respondents fell within the age group of 31–40 years, while 28.9% were within 41–50 years. Younger farmers (21–30 years) constituted 20%, and only 15.5% were above 50 years. This distribution suggests that women in their middle ages are more actively involved in farming, reflecting the critical role of agriculture in sustaining household livelihoods. Marital status analysis shows that 68.9% of the women were married, while 13.3% were single. Widows constituted 11.1%, and 6.7% were separated or divorced. This high proportion of married women reflects the household responsibilities associated with women's farming activities, which often supplement family income and food security. In terms of education, 33.3% had secondary education, while 26.7% had only primary education. Notably, 20% of the respondents had no formal education, while another 20% attained tertiary education. The distribution indicates moderate literacy levels, but the significant proportion without formal education may limit their ability to access credit, technology, and extension services. Household size averaged 6.1 members, with the majority (51.1%) having between 5–8 persons per household. Larger households may

increase the demand for food and income but can also provide family labor for farming. Farming experience averaged 12.4 years, suggesting that the respondents have accumulated substantial knowledge in agricultural practices. Nearly half (48.9%) had 1–10 years of experience, while 33.3% had 11–20 years. Only 17.8% had more than 20 years of experience. This shows a mixture of relatively new and moderately experienced farmers in the study area. Finally, the mean farm size was 2.1 hectares, with 46.7% cultivating between 1–2 hectares, 31.1% above 2 hectares, and 22.2% below 1 hectare. This reflects the dominance of smallholder farming among women, which may limit productivity due to resource constraints.

Table 1. *Socio-Economic Characteristics of the Respondents in the Study Area (n = 90).*

Variables	Freq.	%	Mean ± SD
Age			42.6 ± 8.4
21-30	18	20	
31-40	32	35.6	
41-50	26	28.9	
>50	14	15.5	
Marital Status			
Single	12	13.3	
Married	62	68.9	
Widowed	10	11.1	
Separated/divorced	6	6.7	
Educational level			
No formal education	18	20	
Primary	24	26.7	
Secondary	30	33.3	
Tertiary	18	20	
Household size			6.1 ± 2.3
1-4	28	31.1	
5-8	46	51.1	
>8	16	17.8	
Farming experience			12.4 ± 6.8
1-10	44	48.9	
11-20	30	33.3	
>20	16	17.8	
Farm Size (Ha)			2.1 ± 1.4
<1	20	22.2	
1-2	42	46.7	
>2	28	31.1	

Source: Field survey, 2025

3.2. Gender Disparities in Access to Agricultural Resources

The result table reveals clear gender disparities in access to key agricultural resources in Ekiti State. Male farmers dominate in most resource categories, particularly land ownership (82.2% for men compared to 46.7% for women), access to credit (66.7% vs. 40.0%), and membership in cooperatives (62.2% vs. 26.7%). These differences suggest that men possess stronger control over productive assets and institutional networks that enhance agricultural productivity. Women's limited land ownership reflects persistent tenure constraints and inheritance practices that favor men, which consequently affect their ability to use land as collateral for credit or to make long-term farm investments. Similarly, the lower percentage of women with access to extension services (33.3% compared to 44.4% for men) indicates restricted exposure to improved farming techniques and advisory support.

Access to farm inputs (7.1% for men; 46.7% for women) and technology (66.7% for men; 44.4% for women) further demonstrates the productivity gap between male and female farmers. Since modern agriculture relies heavily on improved seeds, fertilizers, mechanization, and digital innovations, limited access for women constrains their efficiency and output levels. The relatively low cooperative membership among women (26.7%) is particularly significant because cooperatives often serve as channels for accessing subsidized inputs, training, and market information. These findings are consistent with recent studies by [9] and [4], which reported that female farmers in Nigeria generally receive fewer extension visits and have lower access to improved technologies compared to men. Likewise [2] and [1] emphasize that gender gaps in land and credit access remain major structural barriers affecting women's agricultural productivity across Sub-Saharan Africa.

However, an interesting deviation appears in access to markets, where women (73.3%) slightly outperform men (64.4%). This suggests that despite limited control over productive resources, women may be more actively involved in produce marketing and local trading activities. This finding aligns with [3], which notes that women in many African rural communities play dominant roles in food distribution and informal market systems. Nevertheless, stronger market participation does not necessarily compensate for restricted access to land, finance, and technology, which are fundamental drivers of large-scale productivity and income growth.

Table 2. Gender Disparities in Access to Agricultural Resources.

Resources	Male Farmers		Women farmers	
	Freq.	%	Freq.	%
Land ownership	37	82.2	21	46.7
Access to credit	30	66.7	18	40.0
Ext. services	20	44.4	15	33.3
Farm inputs	32	71.1	21	46.7
Markets	29	64.4	33	73.3
Technology	30	66.7	20	44.4
Cooperatives	28	62.2	12	26.7

Source: Field survey, 2025

3.3. Probit Regression on Factors Influencing the Respondents' Access to Agricultural Resources

The Probit regression results indicate that the model provides a statistically reliable explanation of farmers' access to agricultural resources. The likelihood ratio Chi-square (LR $\chi^2 = 62.45$, $p < 0.01$) shows that the joint effect of the explanatory variables is significant, meaning the model fits the data better than a null model with no predictors. In addition, the Pseudo R^2 value of 0.281 suggests that approximately 28.1% of the variation in access to agricultural resources is explained by the included variables, which is considered acceptable for cross-sectional household-level models using limited dependent variable techniques. As noted by [14], Probit models are appropriate when the dependent variable is binary and coefficients reflect the direction of influence on the probability of occurrence. Similarly, [15] emphasizes that a significant LR statistic combined with a reasonable Pseudo R^2 indicates a good overall model fit in qualitative response models. Therefore, the econometric tool employed is statistically suitable for analyzing determinants of farmers' access to agricultural resources.

The regression coefficients further reveal that marital status ($p < 0.05$), educational level ($p < 0.01$), membership in farm organizations ($p < 0.01$), level of income ($p < 0.01$), access to credit ($p < 0.01$), access to information ($p < 0.05$), availability of resources ($p < 0.01$), and access to extension services ($p < 0.01$) positively and significantly influence farmers' access to agricultural resources. This implies that being married, more educated, financially stable, institutionally connected, and better informed increases the likelihood of accessing productive agricultural inputs and services. These findings are consistent with recent empirical studies by [16], who found that education and institutional participation significantly enhance smallholder access to agricultural services, and by [17] who reported that income level and access to credit substantially increase farmers' participation in resource-enhancing programs. The strong positive coefficient for farm organization membership (0.472***) underscores the importance of collective action in facilitating access to extension, credit, and subsidized inputs.

Conversely, household size and number of dependents show negative and significant effects, indicating that larger household burdens reduce the probability of accessing agricultural resources. This may be due to increased consumption pressures that limit investible surplus and reduce savings for farm investment. Age and occupation, however, are statistically insignificant, suggesting that these factors do not independently determine access once other socioeconomic variables are controlled for. The negative influence of household demographic pressure aligns with findings by [18], who observed that dependency ratios can constrain smallholder investment capacity. Similarly, [19] noted that farmers with high dependency burdens are less likely to participate in formal agricultural programs due to financial constraints.

Table 3. Probit Regression Results on Factors Influencing Respondents' Access to Agricultural Resources.

Variable	Coefficient	Std	P-value
Age	0.012	0.009	0.184
Marital status	0.218**	0.102	0.032
Educational level	0.356***	0.119	0.003
Household size	-0.042*	0.025	-0.093
Membership in Farm Org.	0.472***	0.162	-0.004
Level of income	0.015***	0.005	0.002
Number of dependents	-0.065**	0.030	-0.030
Access to credit	0.588***	0.174	0.001
Access to information	0.344**	0.148	0.021
Availability of resources	0.529***	0.195	0.007
Occupation	-0.112	0.082	-0.170
Access to extension service	0.466***	0.173	0.007
LR Chi^2	62.45*		
Pseudo R^2	0.281		

Source: Field survey, 2025
Significance: $p < 0.10$, $p < 0.05$, $p < 0.01$

3.4. Effect of Gender Disparities on Farmers' Agricultural Livelihoods

The Ordinary Least Squares (OLS) regression results show that gender-related disparities in access to productive resources significantly influence farmers' agricultural livelihoods. The model demonstrates strong explanatory power, with an R^2 of 0.64 and an adjusted R^2 of 0.59, indicating that approximately 64% of the variation in farmers' livelihood outcomes is explained by the included variables. This suggests a good model fit for cross-sectional farm-level data. As noted by Wooldridge (2022), an adjusted R^2 close to the R^2 value indicates that the included regressors meaningfully contribute to explaining variations in the dependent variable. The overall results therefore confirm that disparities in access to land, credit, markets, and technology play a substantial role in shaping livelihood outcomes.

Among the explanatory variables, land ownership (482.11***), land tenure security (398.43**), availability of credit (322.65***), market access (415.22***), and access to technology (278.95**) show positive and statistically significant effects on agricultural livelihoods. This implies that farmers who own land, enjoy secure tenure arrangements, and have access to financial services, markets, and modern technologies experience significantly better livelihood outcomes. The strong coefficient for land ownership highlights the importance of asset control in determining productivity and income levels. These findings are consistent with recent studies by [20], who emphasized that secure land rights enhance agricultural investment and welfare, and by [21], who showed that access to productive assets and markets significantly improves farm income in developing countries. The positive effect of credit access further aligns with findings by [22], who reported that financial inclusion enhances smallholder productivity and income stability.

Farming experience (142.66**) and age (120.45*) also positively influence livelihood outcomes, suggesting that accumulated knowledge and exposure improve farm management efficiency. However, household size, educational level, size of landholding, and access to market information are statistically insignificant, indicating that these variables do not independently drive livelihood improvements once structural resource access factors are controlled for. The insignificance of land size, despite the significance of land ownership and tenure, suggests that security and control over land may matter more than mere farm size. This observation supports recent arguments by [23] that institutional quality and tenure security are stronger determinants of agricultural welfare than farm size alone.

Table 4. *OLS Regression Result on Effect of Gender Disparities on Farmers' Agricultural Livelihoods.*

Variable	Coeff.	Std. Err.	t-value
Age	120.45*	68.22	1.76
Household size	-98.32	88.16	-1.12
Educational level	356.78	311.45	1.14
Farming experience	142.66**	58.32	2.45
Land ownership	482.11***	176.25	2.74
Land tenure	398.43**	158.90	2.51
Size of landholding	214.55	180.73	1.19
Availability of Credit	322.65***	120.44	2.68
Market access	415.22***	152.63	2.72
Access to technology	278.95**	118.11	2.36
Access to market information	195.88	192.44	1.02
Constant	234.67**	120.34	2.09
R^2	0.64		
Adj. R^2	0.59		

Source: Field survey, 2025

4. Conclusion

This study affirms that gender disparities remain a central challenge to agricultural development in the study area. Women farmers, despite their crucial role in food production and household sustenance, continue to operate under structural and institutional constraints that limit their full potential. Addressing these barriers is essential not only for improving women's livelihoods but also for advancing food security, poverty reduction, and rural development more broadly.

5. Recommendations

Based on these findings, the following recommendations are made.

1) Women's access to land should be improved, and policies should ensure secure and equitable land tenure.
2) Education and literacy programs should be expanded to empower women with knowledge and agricultural skills.
3) Credit and financial services should be made more accessible through gender-sensitive and flexible programs.
4) Extension and training services should target women to provide timely information and improved technologies.
5) Women should be encouraged to join cooperatives to benefit from collective resources and support.
6) Market access and rural infrastructure should be improved to help women participate effectively in agriculture.
7) Access to labor-saving tools and climate-smart technologies should be expanded to boost women's productivity.

Abbreviations

OLS	Ordinary Least Squuare
NPC	National Population Council
AEZs	Agro Ecological Zones
LGAs	Local Government Areas

Author Contributions

Olusola Bunmi Adegbuyiro: Conceptualization, Investigation, Methodology, Project administration, Resources

Rufus Sunday Owoeye: Data curation, Formal analysis, Funding acquisition, Software, Methodology, Supervision, Validation, Visualization, Writing – original draft, Writing – review and editing

Conflicts of Interest

The authors declare no conflicts of interest.

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