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Financial Inclusion and Welfare Outcomes among Rural Women in Edo State, Nigeria

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Abstract

This study examined the multidimensional nature of financial inclusion, awareness, access, and utilisation, and their effects on household food security and dietary diversity among 360 rural women in Edo State, Nigeria. while 71.0% demonstrate high awareness and 78.7% high access, only 15.2% achieve high utilisation. Access (OR = 0.856) and utilisation (OR = 0.913) are significantly associated with lower food insecurity, while utilisation alone improves dietary diversity (OR = 1.148). Institutional constraints, notably collateral requirements and socio-cultural barriers including family pressure and peer influence, emerge as high-severity obstacles. The findings challenge access-centric policy paradigms by showing that utilisation, not mere availability, is the critical channel for welfare. Policy must pivot toward usage-centric, gender-sensitive interventions that simplify institutional requirements and address normative barriers.

Keywords: financial inclusion, rural women, welfare outcomes

Introduction

Financial inclusion, which is the availability, accessibility, and active use of affordable financial products and services, has emerged as a policy priority for sustainable development, particularly among marginalised populations in low- and middle-income countries (Demirgüç-Kunt et al., 2022). In Nigeria, where the rural sector accounts for a substantial share of national output and employment, expanding financial participation is central to poverty reduction and gender equity objectives (Central Bank of Nigeria (CBN), 2024). Despite this policy emphasis, rural women remain disproportionately excluded from formal financial systems due to intersecting structural, institutional, and socio-cultural barriers (Adegbite & Machethe, 2020; Okolo-Obasi et. al., 2024).

Recent evidence from the Global Findex Database reveals a troubling paradox: while account ownership has improved across Sub-Saharan Africa, the use of financial services, measured by savings frequency, credit uptake, insurance enrollment, and digital transactions, remains persistently low (Demirgüç-Kunt et al., 2022). This “usage gap”

represents a critical blind spot in financial inclusion policy. Access without active utilisation fails to generate the consumption-smoothing, risk-managing, and investment-enabling benefits that translate into improved household welfare (Karlan et. al., 2014). For rural women in agrarian regions where livelihoods are seasonal and exposure to climatic and health shocks is acute, this disconnect between access and use may explain why inclusion initiatives have yielded limited welfare gains.

Edo State, located in southern Nigeria, provides a compelling empirical context for examining this phenomenon. The state is characterised by rainforest vegetation, although the northern part of the state exhibits derived savanna ecology, agrarian livelihoods, and entrenched traditional gender norms that constrain women's economic autonomy. Although formal bank branches are present in urban centres, rural communities rely heavily on informal savings groups (*esusu* or *ajo*) and local moneylenders because of poor road networks, low financial literacy, and cultural restrictions on women's financial decision-making (Doss et al., 2020). The consequences of this exclusion extend beyond economic stagnation to include poor welfare outcomes, such as food insecurity, limited dietary diversity, and reduced resilience to shocks.

Against this backdrop, the study examines the multidimensional nature of financial inclusion, which encompasses awareness, access, and utilisation and its effects on household welfare among rural women in Edo State, Nigeria. Specifically, it addresses the following research questions:

1. What is the extent of awareness of financial services by rural women?
3. How accessible are these services to rural women?
4. What is the extent of utilisation of these services by rural women?
5. Has financial services improved the welfare outcomes of rural women?
6. What structural, institutional, and socio-cultural barriers constrain access to and usage of financial services by rural women?
7. What is the relationship between financial services and the welfare outcomes of rural women?

Theoretical Framework

This study employs an integrated theoretical framework that combines Women's Economic Empowerment Theory, the Sustainable Livelihood Framework, Transaction Cost and Access Theory, and Intra-Household Bargaining Theory to explain the severe usage gap in financial inclusion among rural women in Edo State, Nigeria. Women's Economic Empowerment Theory (Kabeer, 1999) establishes that empowerment does not require merely access to resources but the agency to convert them into wellbeing gains, implying that account ownership without active, welfare-enhancing use constitutes incomplete empowerment. The Sustainable Livelihood Framework (Scoones, 1998) extends this by positing that financial capital is only productive when integrated with complementary human, social, and physical capital; thus, low financial literacy, poor infrastructure, and weak institutional trust render formal financial services non-functional. Transaction Cost and Access Theory (Williamson, 1985; Besley, 1995) explains the rational calculus underlying non-use: when direct costs, opportunity costs, and

information costs of maintaining formal accounts exceed perceived benefits, women revert to informal mechanisms such as "*Adashi"* groups despite their higher risks. Intra-Household Bargaining Theory (Manser & Brown, 1980; McElroy & Horney, 1981) reveals that even when accounts exist, patriarchal norms and weak fallback positions may lead to male capture of resources, reducing women's incentive to maintain active usage. Collectively, these theories demonstrate that the usage gap is not a residual of access exclusion, but a distinct phenomenon shaped by agency deficits, asset-interdependence failures, cost-benefit rationality, and gendered power asymmetries. The framework argues that meaningful financial inclusion requires services that are not only accessible but also livelihood-compatible, cost-efficient, and autonomy-preserving within women's household and community contexts.

Methodology

The study was conducted in Edo State, Nigeria (6°30′N, 6°00′E). The state covers approximately 17,802 km² and had a projected population of 4,235,595 in 2016 (National Population Commission, 2016). Administratively, Edo State comprises 18 Local Government Areas (LGAs) distributed across three ecological zones: Edo South (rainforest and mangrove swamp), Edo Central (transitional rainforest and savanna), and Edo North (predominantly savanna with limited rainforest). Agriculture remains the dominant livelihood activity, with major crops including yam, cassava, maize, rice, cocoa, and palm produce.

A multistage sampling procedure was employed to select respondents for the study. The first stage involved randomly selecting two (2) agricultural zones from the study area: Edo North and Edo South Agricultural Zones. Edo North Agricultural Zone comprises six LGAs: Akoko Edo, Etsako East, Etsako West, Etsako Central, Owan West, and Owan East. In the Edo South-South agricultural zone, there are seven (7) LGAs, which include Oredo, Ikpoba-Okha, Egor, Ovia Northeast, Ovia Southwest, Orhionmwon, and Uhunmwonde. Within Edo North, Etsako Central and Etsako East LGAs were purposively selected, and from Edo South, Ovia North East and Ikpoba Okha were purposively selected due to their high concentration of rural households, dependence on smallholder agriculture, and pronounced gender roles in agricultural production and household decision-making. This resulted in four (4) LGAs being selected in total. Three communities were purposively sampled from each of these four LGAs for the reasons above, and an average of 30 rural women were randomly selected per community, yielding a total sample of 360 respondents.

Primary data were collected through a structured questionnaire administered face-to-face to respondents who provided informed consent. Awareness was measured using nine binary (Yes/No) items covering knowledge of banking services, savings accounts, bank loans, mobile banking platforms, interest rate incentives, transaction costs, government/NGO programmes, women-targeted Micro-Finance Bank packages, and insurance. Affirmative ("Yes") responses were scored 1 and negative ("No") responses scored 0; scores were summed across the nine items to generate a composite Awareness Score ranging from 0 to 9 (Cronbach's $\alpha = 0.86$), with higher scores indicating greater awareness. Respondents scoring at or above 50% of the maximum possible score (≥ 4.5) were classified as having high awareness, and those below this threshold as having low

awareness. Access was captured through eight binary items regarding proximity to branches, ATMs, electricity, documentation, mobile phones, SIM cards, internet, and mobile money services. Responses were summed across the eight items to generate a composite access score ranging from 0 to 8 (Cronbach's α = 0.73). Mean scores were calculated and used to categorise respondents into high and low levels of access, with a threshold of 50% of the maximum possible score (≥ 4.0). Utilisation was assessed across eight financial service items: bank account ownership, use of an account for payments and bill settlement, use of an ATM card for withdrawals, ATM-based fund transfers, ATM bill payments, use of mobile money services, use of formal financial services to secure loans, and use of insurance services. Each item was scored on a unified 5-point frequency scale ranging from 0 (Never/Not used) to 4 (Always), with intermediate categories of 1 (Rarely), 2 (Sometimes), and 3 (Often). Scores were summed across the eight items to generate a composite utilisation score ranging from 0 to 32 (Cronbach's α = 0.85), with higher scores indicating more frequent and diversified use of financial services. In this sample, the observed range was 0–31 (M = 9.67). Respondents scoring at or above 50% of the maximum possible score (≥ 16) were classified as having high utilisation, and those below as having low utilisation.

The Household Food Insecurity Access Scale (HFIAS) and Dietary Diversity Index (DDI) were used as proxy indicators to assess welfare outcomes. Respondents were administered the standard nine-item HFIAS questionnaire and asked to indicate whether each condition had occurred within the previous 30 days using dichotomous responses of “Yes” or “No.” Affirmative responses were subsequently followed by a frequency-of-occurrence assessment categorised as “Rarely” (once or twice within the past 30 days), “Sometimes” (three to ten times within the past 30 days), and “Often” (more than ten times within the past 30 days), coded as 1, 2, and 3, respectively. Household food insecurity scores were aggregated to generate a continuous HFIAS score ranging from 0 to 27, with higher scores indicating greater food insecurity. Based on established thresholds in the HFIAS Indicator Guide (Coates et. al., 2007), households were classified into four categories: food secure (0–1), mildly food insecure (2–8), moderately food insecure (9–16), and severely food insecure (17–27). Dietary Diversity was measured using the FAO Dietary Diversity Index (DDI), based on consumption of 12 food groups over 24 hours, categorised as Low (0–3), Medium (4–5), and High (6–12).

Constraints to accessing and utilising financial services were examined across three sub-sections: institutional, structural, and socio-cultural barriers. Respondents were presented with a predefined set of potential constraints under each category and were asked to rank them according to the severity of their impact on access and utilisation of financial services, based on their lived experiences. Responses were measured on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), where higher weighted mean scores indicated greater perceived constraints. The mean scores were interpreted using the following classification: scores of 4.50 and above were considered very high constraints; scores between 3.50 and 4.49 indicated high constraints; scores between 2.50 and 3.49 denoted moderate constraints; scores between 1.50 and 2.49 represented low constraints; and scores below 1.50 reflected very low constraints. Descriptive statistics such as mean, percentages and frequency were used to profile the respondents' socio-economic characteristics and to summarise the distributions of

awareness, access, utilisation, constraints to financial inclusion, and household food security outcomes.

To examine the determinants of food security, measured by HFIAS categories, and dietary diversity (DDI categories, ordered logistic regression (proportional odds model) was employed. The proportional odds assumption, that the relationship between each predictor and the cumulative logits is constant across response categories, was tested using a likelihood-ratio test comparing the fitted proportional odds model against a generalised (multinomial) model that relaxes this assumption. A non-significant test result ($p > 0.05$) supports the use of the proportional odds specification. Model fit was assessed via the likelihood-ratio chi-square test (comparing the full model to an intercept-only model), McFadden's pseudo-R^2, and the model log-likelihood. All regression analyses were conducted at the 5% significance level, and results are reported as odds ratios (OR) with 95% confidence intervals.

Results and Discussion

Awareness of Financial Services

Table 1 reveals that most (98.8%) respondents were aware of formal financial services, and 90.0% knew of mobile banking platforms. However, awareness was markedly lower for government and NGO programmes (41.9%) and special packages Microfinance Banks offer to women (52.2%), suggesting that policy outreach and product-specific education remain weak. This disparity is consistent with findings from the Global Findex that, while basic financial awareness is widespread in Nigeria, knowledge of specific products and government initiatives remains limited (Demirgüç-Kunt et al., 2022; Aminu et al., 2025). The low awareness of government programmes (41.9%) is particularly concerning given that targeted interventions such as EdoJobs (a government initiative launched in 2016 to tackle youth unemployment in Edo State, Nigeria) could potentially bridge the inclusion gap for rural women who lack collateral or formal documentation.

Table 1: Awareness of financial services

Awareness Item	Yes (%)
Financial services (bank, mobile money, insurance, etc.)	98.8
Savings account and processing involved	88.3
Bank loan and how it can be obtained	73.1
Mobile banking platforms (OPAY, PAGA)	90.0
Interest rate incentives with deposits	60.0
Transaction costs of formal financial services	72.2
Government/NGO programs (e.g., Edo Jobs)	41.9
Special packages Micro-Finance Banks offer to women	52.2
Insurance	59.7
Overall awareness score (max = 9)	70.7

Source: Field survey, 2025

Access to Financial Services

Access patterns (Table 2) similarly indicate broad *potential* for inclusion. Mobile phone ownership (95.0%), SIM card access (91.4%), and internet availability (77.2%) were high. Documentation access was also favourable (73.3%). Yet physical financial infrastructure remained deficient: only 40.6% had access to bank branches, 38.1% to ATMs, and 35.3% to steady electricity. The overall access score was 64.6%, indicating that while digital preconditions are favourable, last-mile physical infrastructure is lacking. The observed access pattern aligns with Olutegbe et. al. (2025)'s observation on rural farmers' financial behaviour, which identified POS and USSD services as having the highest awareness level. This finding illustrates the "digital precondition paradox" widely documented across Sub-Saharan Africa, whereby increasing mobile phone penetration occurs alongside inadequate physical financial infrastructure (Klapper, 2024). Although widespread ownership of mobile phones and access to SIM cards provide an enabling platform for the expansion of digital financial services, limited proximity to formal banking infrastructure, such as bank branches and ATMs, constrains effective utilisation (Ogunfolaju et. al., 2025). Consequently, digital financial transactions still depend heavily on physical cash-in and cash-out agents, which are frequently inaccessible, distant, or unreliable in rural areas. Furthermore, persistent electricity deficits undermine the efficiency and reliability of digital financial systems, as mobile money agents and banking correspondents require a stable power supply to operate devices and process transactions (AFI, 2022).

This has important implications for rural women's financial inclusion and welfare outcomes. While mobile connectivity may increase the potential for participation in digital financial ecosystems, infrastructural deficiencies significantly restrict consistent access and effective usage. Rural women, who often face mobility constraints, lower incomes, and limited access to transport and energy infrastructure, may therefore be unable to fully translate digital financial access into tangible welfare gains such as improved food security, savings accumulation, income stabilisation, and resilience to economic shocks. As a result, the persistence of infrastructural barriers may reinforce existing inequalities and deepen dependence on informal financial mechanisms despite growing digital penetration.

Table 2: Access to financial services 0

Access Item	**Yes (%)**
Access to bank branches in your area	40.6
Access to any functional ATM	38.1
Access to steady electricity	35.3
Access to required documentation (ID, NIN)	73.3
Access to a mobile phone	95.0
Access to a SIM card	91.4
Access to the internet	77.2
Access to mobile money services	66.1

Source: Field survey, 2025

Utilisation of Financial Services

Results in Table 3 revealed that while basic account ownership showed moderate use ($\bar{x}$= 2.26), advanced and high-value services were virtually unused. This includes: ATM fund transfers ($\bar{x}$= 0.525), commercial loans ($\bar{x}$= 0.516), bill payments via ATM ($\bar{x}$= 0.776) and insurance ($\bar{x}$= 0.334). The non-utilisation of insurance and commercial loans is particularly alarming, as these services are most likely to improve welfare through risk management and investment capacity. This corroborates the findings of Demirgüç-Kunt et. al. (2022) and Chinelo and Ayodeji (2023), who maintained that limited awareness, affordability issues, and mistrust of insurance providers hinder adoption, leaving rural households exposed to financial shocks such as illness, crop failure, or emergencies. The non-utilisation of mobile money (35.9%), despite high awareness (90.0%) (Table 1) and phone ownership (95.0%) (Table 2), suggests that barriers beyond infrastructure, such as digital literacy, trust, and transaction costs, may prevent translation of access into use (Klapper, 2024).

Table 3: Utilisation of financial services

Utilisation Item	Weighted Mean
Bank account (savings/current)	2.26
Account to receive/pay bills	2.099
ATM card for withdrawals	1.702
ATM for fund transfer	0.525
ATM for bill payments	0.776
Mobile money services	1.412
Commercial bank/MFB/mobile money loans	0.561
Insurance services	0.334
Overall Utilisation Score (Mean proportion of max = 32)	**0.302**

Source: Field survey, 2025

Categorisation of Awareness, Access and Utilisation of Financial Services

Results in Table 4 show a disparity between access (78.7% high) and utilisation (15.2% high; this constitutes a severe “usage gap”. This implies that although respondents had a high level of awareness of financial services, that awareness did not translate into effective use. The finding corroborates recent critiques of access-centric financial inclusion metrics and highlights that digital connectivity alone does not ensure active financial participation (World Bank, 2019). Additionally, as Balogun (2024) notes, meaningful financial inclusion extends beyond access to consistent and confident use of financial services, which is essential for enhancing economic resilience and household welfare.

Table 4: Categorisation of composite indices

Category	Per cent (%)
Awareness Level	
High (≥4.5)	71.0
Low (<4.5)	29.0
Access Level	
High (≥4.0)	78.7
Low (<4.0)	21.3
Utilisation Level	
High (≥16)	15.2
Low (<16)	84.8

Source: Field survey, 2025

Welfare Outcomes of Respondents

Results in Figure. 1 reveal a notable disconnect between dietary diversity and food security. While rural households achieve high dietary diversity (92.0% consuming ≥6 food groups), they remain overwhelmingly food insecure (84.3% across mild, moderate, and severe HFIAS categories). This aligns with the results of Ehiwario et. al. (2024), who reported a high level of food insecurity among farming households in Edo and Delta states. The coexistence of high dietary diversity with widespread food insecurity suggests that dietary adequacy does not necessarily imply stable or sufficient food access. While households may consume a variety of food groups, persistent economic vulnerability and unstable access to food resources may continue to expose them to varying degrees of food insecurity. This may be connected to the "usage gap" (Table 4) they experience in accessing and using financial services. This usage gap likely exerts direct pressure on the food security outcomes observed here. Households that do not utilise formal financial mechanisms may need to rely on informal, often precarious, coping strategies such as intra-household borrowing, reduced meal frequency, liquidation of productive assets, or reliance on diverse but nutritionally dilute foods. Corroborating this, studies in Sub-Saharan Africa reveal that women who utilise microloans, digital financial platforms, and savings programs experience significant improvements in food security and overall household welfare (Okolo-Obasi et al*.,* 2024; Karlan et al*.,* 2014). High dietary diversity scores may partially reflect these coping behaviours. Rural women may source small quantities of varied, low-cost items from informal markets or subsistence production to maintain dietary breadth, yet lack the purchasing power or liquidity to secure sufficient quantities or stable access. In other words, diversity becomes a *mask* for quantitative and stability deficits, sustained not by financial resilience but by labour-intensive, fragmented food acquisition strategies.

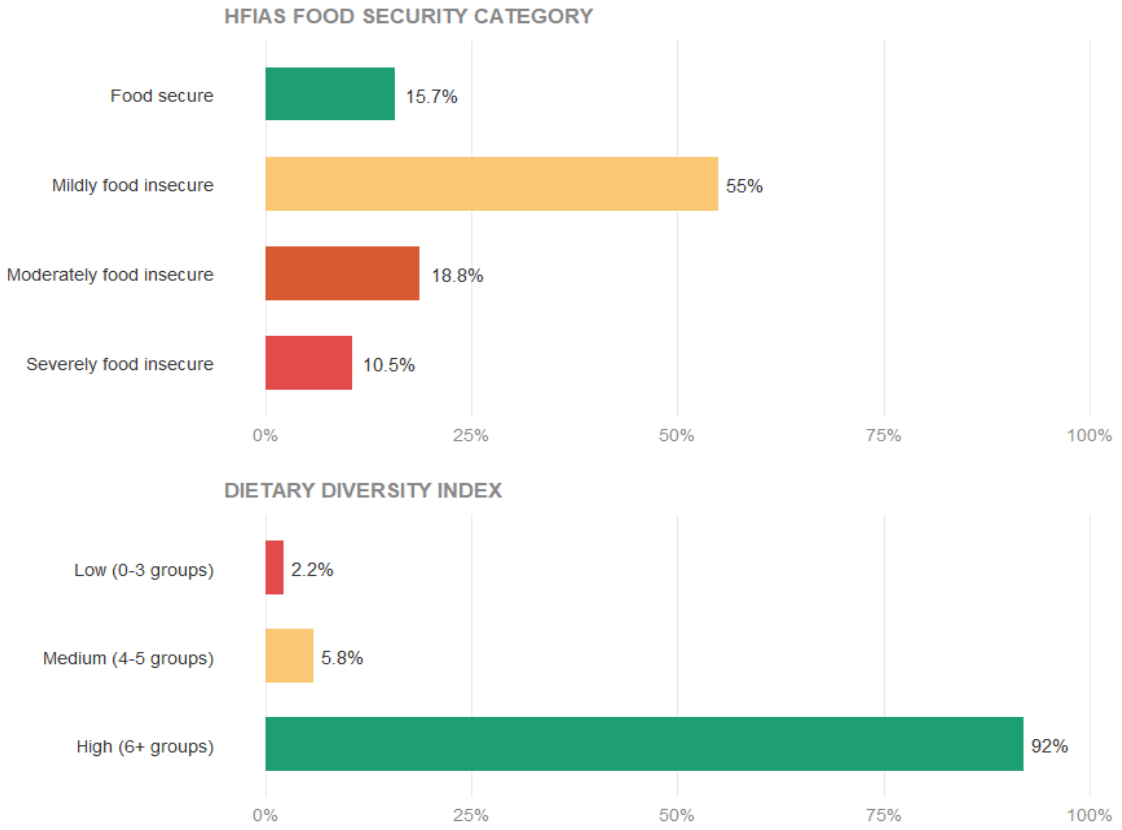

Figure 1: Food Security status of households as indicated by Food security HFIAS and Dietary Diversity
Source: Field survey, 2025

Constraints to Inhibiting Access to and Usage of Financial Services

Table 5 reveals that structural, institutional, and socio-cultural barriers are all rated as moderate overall ($\bar{x}$ ≈ 2.98/5.0). However, specific items within each domain registered as high-severity obstacles. Structurally, the limited number of bank branches in rural areas was rated highly ($\bar{x}$ = 3.56). Institutionally, collateral requirements for loans emerged as the most severe barrier ($\bar{x}$ =3.64), followed by high transaction charges ($\bar{x}$ =3.32) and minimum balance requirements ($\bar{x}$ =3.26). Notably, socio-cultural constraints exhibited the highest severity ratings, which include peer or community influence discouraging formal banking ($\bar{x}$ =3.68), family pressure preventing independent financial decisions ($\bar{x}$ =3.59), and cultural norms discouraging women from managing finances ($\bar{x}$ =2.29, low).

These results suggest that while physical and documentation barriers are moderate, the binding constraints are institutional (collateral, transaction costs) and sociocultural (social pressure and family pressure). This aligns with household bargaining theory, which predicts that women's financial autonomy is constrained by intra-household power dynamics and community norms (AFI, 2022; Njoku et. al., 2025). The high rating

attributed to peer influence is particularly noteworthy, as it suggests that financial decision-making is strongly shaped by social relations, where departing from reliance on informal financial systems may attract social disapproval or costs. This result aligns with broader evidence from Sub-Saharan Africa showing that women's financial choices are significantly shaped by prevailing community norms and the need for spousal or household approval (Aouinti, 2025).

Furthermore, the dominance of collateral requirements as an institutional barrier reflects a systemic design flaw. This is because formal financial products are typically designed for salaried urban clients with documented assets, excluding rural women who lack land titles or formal employment records (Yeyouomo, 2023). Lastly, the moderate rating for documentation requirements also suggests that ID and NIN access is not the primary bottleneck; rather, what institutions demand beyond basic identification excludes rural women. These findings align with broader empirical evidence across sub-Saharan Africa, suggesting that both structural and institutional weaknesses significantly hinder women's participation in formal financial systems (UN Women, 2021; CGAP, 2023). Addressing these barriers will therefore require policy actions that improve rural financial infrastructure, reduce loan costs, simplify procedures, and promote inclusive banking practices.

Table 5: Constraints inhibiting access to and usage of financial services

Constraint Item	Weighted Mean	Constraint Level
Structural Constraints		
Distance to the nearest bank branch is a barrier	3.116	Moderate
Poor road network limits access	2.704	Moderate
Inadequate power supply affects mobile banking	3.163	Moderate
Limited bank branches in rural areas	3.555	High
High transportation cost	2.406	Low
Institutional Constraints		
Strict documentation requirements	2.000	Low
High minimum balance requirements	3.257	Moderate
Complex account opening procedures	2.704	Moderate
High transaction and service charges	3.315	Moderate
Collateral requirements too stringent	3.641	High
Socio-cultural Constraints		
Cultural norms discourage women from managing finances	2.285	Low
Family pressure prevents independent decisions	3.591	High
Low trust in formal financial institutions	2.646	Moderate
Social stigma around formal borrowing	2.66	Moderate
Peer/community influence discourages formal banking	3.682	High

Note: Constraint Level: ≥4.5 Very High; 3.5-4.49 High; 2.5-3.49 Moderate; 1.5-2.49 Low; < 1.5 Very Low.

Source: Field survey, 2025

Determinants of Welfare Outcomes

Household Food Security (HFIAS): The ordered logistic regression (Table 6) reveals that both access and utilisation significantly improve food security. A one-unit increase in the access score reduces the odds of falling into a worse food security category by 15.6% (OR = 0.857), while a one-unit increase in utilisation reduces these odds by 9.1% (OR = 0.913). The constraint score was not statistically significant ($p = 0.178$), though its positive coefficient suggests that higher constraints marginally increase food insecurity risk. The significance of both access and utilisation in the HFIAS model supports the SLF perspective that financial capital operates through multiple channels to improve welfare. Access facilitates food acquisition by enabling market participation, while utilisation does the same through savings, credit, and digital payments, which allow consumption smoothing during lean seasons (Seima, 2024**)**. The stronger effect of access (OR = 0.857) than utilisation (OR = 0.913) in the food security model may reflect the immediate consumption needs of food-insecure households; proximity to financial services enables quick cash access for food purchases, while deeper utilisation requires longer-term behavioural change.

Among control variables, widowed respondents exhibited significantly lower odds of food insecurity compared to married women (OR = 0.362), possibly reflecting smaller household sizes or remittance support. Religion emerged as a strong predictor, with Muslim respondents facing nearly four times higher odds of worse food insecurity than Christians (OR = 3.928), while those practising traditional religions had lower odds (OR = 0.384). These associations may reflect dietary restrictions, fasting practices, or differential access to social safety nets and warrant further investigation. The Muslim disadvantage is consistent with findings from northern Nigeria, where religious practices may coincide with seasonal food scarcity (Adeyemi et. al., 2025).

Table 6: Household food security status

Variable	Estimate	Std. Error	z-value	p-value	OR (exp B)
Intercept (Threshold)	1.432	1.952	0.734	0.4631	4.189
Intercept (Threshold)	-1.744	1.955	-0.892	0.3723	0.175
Intercept (Threshold)	-3.739	1.962	-1.906	0.0566	0.024
Awareness Score	-0.071	0.065	-1.077	0.2815	0.932
Access Score	-0.154	0.071	-2.176	0.0296	0.857
Util Score	-0.091	0.030	-3.014	0.0026	0.913
Constraint Score	0.056	0.042	1.345	0.1785	1.058
Age (standardised)	0.113	0.166	0.68	0.4967	1.119
Household Head	0.067	0.357	0.187	0.852	1.069
Secondary Occupation	0.442	0.410	1.079	0.2806	1.556
Educ (standardised)	0.102	0.150	0.677	0.4985	1.107
Household Size	0.074	0.063	1.178	0.2387	1.077
Income (standardised)	-0.027	0.114	-0.241	0.8094	0.973
MarStat Single	-0.677	0.384	-1.764	0.0778	0.508
Marital Status: Divorced	-0.751	0.54	-1.39	0.1645	0.472
MarStat Widowed	-1.016	0.451	-2.251	0.0244	0.362
Religion_Islam	1.368	0.385	3.556	0.0004	3.927
Religion Traditional	-0.958	0.403	-2.378	0.0174	0.384
Occ Trading	0.333	0.267	1.249	0.2116	1.396
Occ_Artisan	-0.499	0.795	-0.627	0.5304	0.607
Occ_CivilService	-0.417	0.511	-0.816	0.4146	0.659
Occ_Others	0.398	0.368	1.083	0.279	1.489
N	360				
Log-likelihood	-348.368				
McFadden R^2	0.178				
Model χ^2 (df)	150.861 (19)				
p-value (model)	0.000				

Source: Field survey, 2025.

Note: Proportional Odds Model. Positive estimate = higher odds of worse food security. Sex excluded (all-female sample). *** p<.001; ** p<.01; * p<.05; (+) p<.10.

Model χ^2 tests overall fit against null model. The proportional odds test compares against the multinomial model (null: proportional odds holds). Update abstract accordingly

Dietary Diversity Index (DDI)

Table 7 shows that utilisation significantly improves dietary diversity outcomes (OR = 1.147), reinforcing its role as the primary welfare channel. Conversely, larger household size substantially reduces the odds of better dietary diversity (OR = 0.683), indicating resource dilution effects. Age (OR=1.793) and single marital status (OR= 7.301) showed marginal positive associations. Notably, access and awareness were not significant predictors of DDI, further underscoring that welfare gains depend on *active use* rather than passive knowledge or availability. The divergence between HFIAS and DDI predictors is theoretically significant. While access and utilisation improve food security (quantity/access), only utilisation improves dietary diversity (quality). This suggests that deeper financial engagement through savings, credit, and digital payments that enables investments in diverse, nutrient-rich foods that basic access alone cannot facilitate (Adeomi et. al., 2022). The negative effect of household size on DDI (OR = 0.682) aligns

with the resource dilution hypothesis: as household size increases, per-capita food budgets constrain the ability to purchase diverse food groups, leading to reliance on calorie-dense staples (Adeyemi et. al., 2025). The marginal positive effect of age suggests that older women may have greater bargaining power or nutritional knowledge, enabling better dietary choices.

Table 7: Dietary Diversity Index

Variable	**Estimate**	**Std. Error**	**z-value**	**p-value**	**OR (expB)**
Intercept (Threshold)	7.197	5.243	1.373	0.1698	1335.948
Intercept (Threshold)	5.67	5.228	1.085	0.2781	290.152
Awareness_Score	0.008	0.128	0.064	0.9487	1.008
Access_Score	0.093	0.142	0.658	0.5107	1.098
Util_Score	0.137	0.07	1.951	0.0511	1.147
Constraint_Score	-0.06	0.114	-0.525	0.5993	0.942
Age (standardised)	0.584	0.333	1.754	0.0794	1.793
HouseholdHead	-0.778	0.895	-0.869	0.3846	0.459
SecondaryOccupation	-0.406	0.924	-0.44	0.6603	0.666
Educ (standardised)	0.074	0.325	0.227	0.8204	1.077
HouseholdSize	-0.383	0.128	-3.007	0.0026	0.682
Income (standardised)	0.27	0.529	0.51	0.6099	1.31
MarStat_Single	1.988	1.203	1.652	0.0985	7.301
MarStat_Divorced	0.574	1.162	0.494	0.621	1.776
MarStat_Widowed	1.255	1.066	1.177	0.2391	3.506
Religion_Islam	0.482	0.707	0.682	0.495	1.62
Religion_Traditional	-0.931	0.747	-1.246	0.2129	0.394
Occ_Trading	-0.958	0.497	-1.928	0.0538	0.384
Occ_Artisan	15.945	3519.99	0.005	0.9964	8407710
Occ_CivilService	15.208	2102.04	0.007	0.9942	4022871
Occ_Others	-0.667	0.762	-0.875	0.3816	0.513

Statistic	Value
N	360
Log-likelihood	-95.632
McFadden R^2	0.1902
Model χ^2 (df)	44.922 (19)
p-value (model)	0.0007027
Proportional odds test	
χ^2 (df)	35.971(19)
p-value (PO test)	0.01064

Source: Field survey, 2025.

Note: Proportional Odds Model. Positive estimate = higher odds of better dietary diversity. Sex excluded (all-female sample). *** p<.001; ** p<.01; * p<.05; (+) p<.10.

Model χ^2 tests overall fit against null model. The proportional odds test compares against the multinomial model (null: proportional odds holds). Update abstract accordingly.

Conclusion and Policy Recommendations

This study demonstrates that rural women in Edo State face a severe usage gap in financial inclusion; high awareness and access coexist with critically low utilisation. The convergence of high dietary diversity with pervasive food insecurity, set against a backdrop of high financial access but low usage among rural women, reveals a critical policy blind spot: inclusion without engagement does not produce improved welfare. Ordered logistic regression confirms that utilisation is the major channel through which financial inclusion improves household food security and dietary diversity. Institutional barriers, particularly collateral requirements, and socio-cultural constraints, notably family and peer pressure, are the primary obstacles preventing access from translating into welfare gains.

Pivot from Access to Usage**.** Policymakers and financial institutions should shift from account-opening targets to usage metrics. Products should be designed for rural women's specific needs: micro-loans with flexible repayment schedules aligned to agricultural seasons, digital savings groups, and crop insurance. Reform Institutional Requirements**.** The CBN should mandate alternative collateral frameworks, such as group guarantees, digital transaction history-based credit scoring, and movable asset registries, to reduce the collateral burden that disproportionately excludes women. Address Socio-Cultural Barriers**.** Community engagement programmes involving traditional leaders, male partners, and women's groups should be integrated into financial inclusion strategies to shift norms around women's financial autonomy and reduce the stigma of formal borrowing. Leverage Digital Infrastructure. Given high mobile phone penetration, regulators should expand USSD banking and agent networks while ensuring agent liquidity and digital literacy training to build trust and competence among rural women. While the findings suggest that married women and Muslim households may experience higher vulnerability to food insecurity, these relationships warrant further investigation before informing targeted policy interventions. Future research should explore the underlying mechanisms driving these associations, particularly the role of cultural, economic, and institutional factors, to determine whether religion-based targeting is appropriate or whether unmeasured variables such as geographic location, ethnicity, or socioeconomic status confound the observed effect.

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