



**GENDER INCLUSIVITY AND PERCEIVED AGRICULTURAL SERVICE
RESPONSIVENESS AMONG SMALLHOLDER FARMERS IN AKWA IBOM STATE,
NIGERIA**

Nkanta, V.S., Archibong, I.V. and Uloh, C.O.

Department of Agricultural Extension and Rural Development

University of Uyo, Akwa Ibom State, Nigeria

Phone Number: 08101391153 Email: ulohcollins86@gmail.com

Abstract

Gender disparities in agricultural service access remain a persistent challenge in Nigeria, limiting productivity and rural development. This study examined gender inclusivity and perceived agricultural service responsiveness among smallholder farmers in Akwa Ibom State. Specifically, it assessed the level of gender inclusivity in service access, measured perceived responsiveness and determined their relationship. A multistage sampling technique was used to select 300 respondents (150 males and 150 females) from three agricultural zones. Data were collected through a structured questionnaire, and analysed using descriptive statistics, t-tests, Pearson correlation, and linear regression. Results showed moderate to high inclusivity in most domains, with highest agreement for household decision-making participation (84.0%) and confidence in engaging extension agents (81.3%), but lower access to credit (48.7%) and community-level decision involvement (56.3%). Perceptions of service responsiveness were generally positive, with highest ratings for respectful treatment (82.3%) and lowest for accessibility regardless of location (63.0%). Gender differences were significant in several resource-based indicators, favouring males. Correlation analysis revealed a significant positive relationship between gender inclusivity and service responsiveness ($r = .52, p < .01$), while regression indicated that inclusivity explained 27% of the variance in responsiveness ($B = 0.57, p < .001$). The study concluded that improving gender inclusivity substantially enhances farmers' perceptions of service quality and effectiveness. It was therefore recommended to expand equitable resource access, strengthen community-level participation, improve service accessibility, sustain gender-mainstreaming in extension delivery, and integrate inclusivity monitoring into agricultural service evaluations.

Key words: Gender inclusivity, Agricultural service responsiveness, Smallholder farmers, Extension services

1.0 Introduction

Gender inclusivity has emerged as a central pillar in discussions on sustainable agricultural development, driven by increasing evidence that the equitable involvement of men and women in agricultural systems enhances productivity, innovation, and community well-being (Grabowski *et al.*, 2020; Adefila *et al.*, 2024). Globally, the agricultural sector remains structurally gendered, with women often marginalized in access to productive resources, extension services, credit, and decision-making processes (Perelli *et al.*, 2024; Kamara *et al.*, 2025). In Nigeria, persistent gender gaps in agricultural support systems have limited women's full participation, despite their substantial contribution to food production and rural livelihoods (Akinrotimi *et al.*, 2024; Ifeanyi-obi and Uloh, 2025a).

Agricultural services, including extension delivery, credit access, input supply, and information dissemination, play a critical role in improving farm outcomes and resilience. However, how these services respond to the needs of different gender groups remains a vital issue. Responsiveness in this context refers to the ability of agricultural service providers to acknowledge, adapt, and meet the specific needs of diverse users, especially marginalized groups (Bishwakarma and Kattel, 2025). Inadequate responsiveness leads to exclusion, inefficiency, and poor service utilization, weakening the overall impact of agricultural programs (Dahal *et al.*, 2020; Kassem *et al.*, 2021). Literature has shown that when services are gender-blind or biased, female farmers face disproportionate challenges in adoption of

innovations and resource mobilization (Melissa *et al.*, 2024; Ojo and Baiyegunhi, 2023).

Despite increasing advocacy for gender-equitable agricultural systems, studies have largely focused on service access in general terms, with limited attention paid to the interplay between gender inclusivity and perceived responsiveness of agricultural services, particularly from the perspective of smallholder farmers. While Ajah and Okorie (2021) noted educational and gender disparities in extension access in North Central Nigeria, Akinrotimi *et al.* (2024) highlighted gendered constraints in credit utilization among farmers in Ondo State. These studies, however, do not adequately explore how inclusive practices influence perceptions of service effectiveness and responsiveness. Furthermore, existing assessments of agricultural service delivery rarely incorporate standardized, context-sensitive tools that measure perceived responsiveness across gender lines (Bishwakarma *et al.*, 2022; Eduafo *et al.*, 2024).

In Akwa Ibom State, previous studies have revealed gaps in gender responsiveness of agricultural policies and service delivery structures. For instance, Asanwana and Uloh (2025a) found that although gender-sensitive extension frameworks exist on paper, implementation remains uneven and inconsistent, with rural women often sidelined in program participation. Similarly, Ifeanyi-obi and Uloh (2025b) reported gendered inequalities in occupational health outcomes, which could be linked to poor tailoring of extension and health advisory services. Moreover, studies

have shown that digital and pluralistic extension approaches, though gaining momentum, still reflect underlying gender asymmetries in their outreach and impact (Asanwana and Uloh 2025b; Jawoko *et al.*, 2023).

The consequence of unresponsive and non-inclusive agricultural services in Akwa Ibom State is multifaceted: reduced service utilization, poor adoption of innovations, declining farm productivity, and worsening rural poverty, especially among female-headed households. If this situation persists, the state's agricultural development goals may remain unattainable. Therefore, there is a pressing need to empirically examine how gender inclusivity affects farmers' perception of service responsiveness. This study seeks to address these gaps by analyzing the relationship between gender inclusivity and perceived agricultural service responsiveness among smallholder farmers in Akwa Ibom State.

1.1 Objectives of the Study

The broad objective of the study was to examine gender inclusivity and perceived agricultural service responsiveness among smallholder farmers in Akwa Ibom State, Nigeria.

The specific objectives were to:

- i. assess the level of gender inclusivity in agricultural service access among smallholder farmers;
- ii. measure the perceived responsiveness of agricultural services;
- iii. determine the relationship between gender inclusivity and agricultural service responsiveness.

2.0 Methodology

The study was conducted in Akwa Ibom State, Nigeria, located in the South-South geopolitical zone, bounded by Cross River State to the east, Abia State to the north, Rivers State to the west, and the Atlantic Ocean to the south. The state covers about 7,081 square kilometers and is predominantly agrarian, with a large proportion of its population engaged in smallholder farming. The target population comprised smallholder farmers in the state. A multistage sampling technique was employed to ensure representativeness and minimize selection bias. First, three agricultural zones were randomly selected from the six in the state (Abak, Eket, Etinan, Ikot Ekpene, Oron, and Uyo). One extension block was then purposively selected from each chosen zone based on active agricultural activities and functional extension presence. From each block, 50 male and 50 female smallholder farmers were randomly selected, giving a total sample size of 300 respondents (150 males and 150 females). The choice of an equal male-female distribution was to allow for direct gender comparisons, as recommended in gender-responsive agricultural research (Ajah and Okorie, 2021; Uko *et al.*, 2025). A sample size of 300 was considered adequate for both descriptive and inferential analyses, consistent with similar studies on gender and agricultural service delivery in Nigeria and Sub-Saharan Africa (Kamara *et al.*, 2025; Quaye *et al.*, 2017).

Data were collected using a structured questionnaire containing validated scales for measuring gender inclusivity and perceived agricultural service responsiveness. The

questionnaire was pretested to ensure clarity and reliability, with Cronbach’s alpha values meeting the acceptable threshold of $\alpha \geq 0.70$ for multi-item constructs. Descriptive statistics such as means, standard deviations, and percentages were used to summarize respondents’ characteristics and responses. Independent samples t-tests were applied to examine differences between male and female farmers in gender inclusivity and service responsiveness indicators.

The explicit form of the model is given as:

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon \tag{1}$$

Where:

Y = Agricultural Service Responsiveness score,

β_0 = Constant term,

β_1 = regression coefficient of the predictor variable,

X_1 = Gender Inclusivity Index score,

ε = error term

The implicit form is expressed as Agricultural Service Responsiveness = f(Gender Inclusivity). Linear regression was used due to the continuous nature of both variables, the expected linear relationship, and its successful application in similar studies (Bishwakarma *et al.*, 2025; Asanwana *et al.*, 2025). Model assumptions were tested and met. Gender inclusivity was included based on evidence of its influence on farmers’ access, participation, and service satisfaction (Adefila *et al.*, 2024; Melissa *et al.*, 2024; Ifeanyi-Obi and Uloh, 2025c). Data analysis was conducted using SPSS 26 at a 5% significance level.

To examine the relationship between gender inclusivity and agricultural service responsiveness, Pearson’s correlation analysis was employed, followed by a simple linear regression model, as this approach quantifies the strength and direction of the relationship while allowing prediction of the dependent variable from the independent variable (Kassem *et al.*, 2021; Bishwakarma and Kattel, 2025).

3.0 Results and Discussion

Level of Gender Inclusivity in Agricultural Service Access

Table 1 shows that household decision-making participation recorded the highest agreement rate (84.0%), followed by confidence in engaging with extension agents (81.3%) and access to extension services when needed (76.3%). Access to credit had the lowest agreement (48.7%), with relatively lower scores also recorded for consultation in community farming decisions (56.3%) and equal access to farm inputs (63.0%). Overall, mean scores suggest moderate to high inclusivity in most domains, though disparities remain in areas relating to financial resources and decision-making at the community level.

The findings reflect partial progress in fostering gender inclusivity in agricultural service access, with stronger performance in household decision-making and interpersonal confidence but persistent challenges in resource-based and institutional domains. This pattern aligns with reports by Ragasa *et al.* (2013) and Dick and Ouko (2024), which highlight that women's participation is often more evident within household-level activities than in public or financial spheres. Limited access to credit, as observed here, has been linked to structural barriers and discriminatory lending practices (Akinrotimi *et al.*, 2024), while the relatively low consultation in community-level decisions echoes the

entrenched sociocultural norms described by Damba *et al.* (2024) and Daudu *et al.* (2022). The comparatively high scores in personal agency indicators, such as confidence in engaging extension agents, may be related to increasing gender-responsive extension interventions in the region (Asanwana and Uloh, 2025a), though the persistence of gaps in input and credit access suggests that such programs have not yet achieved comprehensive equity. These trends underscore the continued relevance of policy and programmatic measures aimed at dismantling institutional barriers while reinforcing emerging gains in farmer empowerment.

Table 1: Descriptive statistics of gender inclusivity indicators among smallholder farmers (n = 300)

Gender Inclusivity Indicator	Mean	SD	% Agree*
I have access to extension services when needed	3.87	0.96	76.3%
I am invited to attend agricultural training or demonstration sessions	3.65	1.12	70.7%
I have equal access to farm inputs (e.g., seeds, fertilizer)	3.42	1.18	63.0%
I can access credit for agricultural production	2.96	1.22	48.7%
I participate in household decisions related to farming	4.10	0.88	84.0%
I am consulted when community-level farming decisions are made	3.25	1.20	56.3%
I have access to farmland under my own control	3.78	1.06	71.7%
I feel confident engaging with extension agents regardless of gender	4.03	0.91	81.3%

Note: Response scale ranges from 1 = Strongly Disagree to 5 = Strongly Agree.

*% Agree = percentage of respondents selecting "Agree" or "Strongly Agree."

Table 2 indicates significant differences in seven of the eight measured indicators. Males reported higher mean scores than females for access to extension services ($p < .01$), participation in training ($p < .05$), access to farm inputs ($p < .05$), access to

credit ($p < .01$), access to own farmland ($p < .05$), and, marginally, community-level decision involvement ($p = .061$). No significant gender difference was found in household decision-making participation or confidence when interacting with extension

agents. These results suggest that while certain dimensions of inclusivity are gender-neutral, others remain skewed toward male advantage, particularly in tangible resource and institutional access.

The observed male advantage in access to productive resources and institutional services is consistent with prior evidence from Nigeria and other sub-Saharan African contexts (Ajah and Okorie, 2021; Damba *et al.*, 2024). Gendered disparities in access to extension services and training may reflect persistent male-targeted outreach patterns, as documented by Ragasa *et al.* (2013) and Quaye *et al.* (2017). Differences in farmland control and credit access also mirror

findings from Daudu *et al.* (2022) and Akinrotimi *et al.* (2024), which attribute such inequalities to land tenure systems and credit collateral requirements that disadvantage women. The absence of significant differences in household decision-making and extension agent interaction confidence suggests a narrowing gap in personal agency, potentially linked to recent gender-mainstreaming initiatives (Asanwana and Uloh, 2025b). However, the persistence of disparities in resource access signals that structural reforms, rather than interpersonal capacity building alone, are necessary to achieve full gender parity in agricultural service responsiveness.

Table 2: Comparison of gender inclusivity indicators by sex (n = 300; Male = 150, Female = 150)

Indicator	Male Mean (SD)	Female Mean (SD)	t-value	p-value
Access to extension services	4.01 (0.91)	3.72 (0.98)	2.73	.007**
Participation in training	3.82 (1.06)	3.48 (1.16)	2.47	.014*
Access to farm inputs	3.55 (1.13)	3.29 (1.21)	2.00	.046*
Access to credit	3.18 (1.17)	2.74 (1.24)	3.08	.002**
Participation in household decision-making	4.12 (0.86)	4.08 (0.91)	0.39	.698
Involvement in community-level farming decisions	3.39 (1.17)	3.11 (1.22)	1.88	.061
Access to own farmland	3.91 (1.03)	3.65 (1.08)	2.06	.040*
Confidence interacting with extension agents	4.08 (0.88)	3.97 (0.93)	1.01	.313

Note: Independent samples t-test used for group comparisons.

p < .05, p < .01

Perceived Responsiveness of Agricultural Services

As shown in Table 3, farmers reported generally positive perceptions of agricultural service responsiveness, with mean scores across indicators ranging from 3.49 to 4.02 on a 5-point scale. The highest agreement was for respectful treatment when seeking services (\bar{x} = 4.02, SD = 0.91; 82.3%

agreement), while the lowest was for service accessibility regardless of location (\bar{x} =

3.49, SD = 1.12; 63.0% agreement). Other dimensions, including timeliness of service delivery, relevance of information, and satisfaction with service quality, all had agreement rates above 70%, indicating that most respondents perceived service delivery as timely, relevant, and of good quality.

The generally high ratings for respectful treatment and relevance of information align

with previous findings that interpersonal aspects of extension services strongly influence farmer satisfaction (Shaba and Alam, 2024; Bishwakarma and Kattel, 2025). Positive perceptions of timeliness and quality may reflect service delivery practices that prioritize farmer needs, as observed in Ghana and Nepal (Somanje *et al.*, 2021; Maake and Antwi, 2022). However, lower scores for accessibility regardless of location echo concerns in literature about spatial disparities in service provision, particularly affecting remote or marginalized farmers (Phiri *et al.*, 2022; Ragasa *et al.*, 2013). Such gaps may arise from infrastructural limitations and uneven extension coverage, underscoring the need for targeted outreach to under-served areas. The relatively strong overall responsiveness ratings suggest that while service quality is positively perceived, structural and geographic barriers remain persistent challenges.

Table 3: Descriptive statistics of agricultural service responsiveness dimensions among smallholder farmers (n = 300)

Service Responsiveness Indicator	Mean (\bar{x})	SD	% Agree*
Extension agents provide services in a timely manner	3.84	1.01	74.3%
The information I receive is relevant to my farming needs	3.91	0.96	78.7%
Agricultural services are accessible regardless of location	3.49	1.12	63.0%
Extension officers are available when I need them	3.76	1.07	70.0%
I am treated with respect when seeking agricultural services	4.02	0.91	82.3%
Agricultural services consider my farming challenges	3.61	1.15	66.3%
I am satisfied with the quality of agricultural extension services received	3.74	1.02	71.7%

Note: Response scale: 1 = Strongly Disagree to 5 = Strongly Agree.

*% Agree = percentage of respondents selecting "Agree" or "Strongly Agree."

Table 4 indicates that male and female farmers reported similar perceptions across

most indicators, with only accessibility of services showing a statistically significant

difference ($t = 2.04, p = .042$). Males rated accessibility slightly higher ($\bar{x} = 3.63, SD = 1.09$) than females ($\bar{x} = 3.34, SD = 1.13$).

For timeliness, relevance, availability, respectful treatment, consideration of challenges, and overall satisfaction, differences between male and female mean scores were small and not statistically significant, suggesting broadly comparable experiences in most aspects of service responsiveness.

The absence of significant gender differences in most dimensions suggests some progress toward gender inclusivity in service delivery, a trend also reported in

parts of Ghana and Uganda where targeted extension reforms have reduced disparities (Quaye *et al.*, 2017; Dick and Ouko, 2024). The lower accessibility ratings among female farmers are consistent with earlier studies highlighting mobility constraints, location-based service gaps, and socio-cultural barriers affecting women’s physical access to extension points (Bryan *et al.*, 2024; Kamara *et al.*, 2025). Such disparities may limit women’s ability to fully benefit from extension programs despite comparable perceptions of service quality. Addressing these issues requires location-sensitive outreach models that accommodate gender-specific mobility patterns and resource access.

Table 4: Comparison of perceived agricultural service responsiveness by sex (n = 300; Male = 150, Female = 150)

Indicator	Male Mean (SD)	Female Mean (SD)	t-value	p-value
Timely service delivery	3.91 (0.98)	3.77 (1.04)	1.20	.232
Relevance of information	3.97 (0.91)	3.85 (1.00)	1.09	.278
Accessibility of services	3.63 (1.09)	3.34 (1.13)	2.04	.042*
Availability of extension officers	3.83 (1.01)	3.68 (1.13)	1.20	.230
Respectful treatment	4.05 (0.85)	3.99 (0.96)	0.60	.549
Consideration of farming challenges	3.71 (1.10)	3.51 (1.19)	1.45	.149
Overall satisfaction	3.79 (0.97)	3.69 (1.07)	0.89	.375

Note: Independent samples t-test used.

$p < .05, p < .01$

Table 5 shows that all multi-item subscales achieved acceptable internal consistency, with Cronbach’s alpha values ranging from .72 for Accessibility and Inclusiveness to .81 for Relevance and Quality. Timeliness and Availability scored .76, while the overall scale achieved $\alpha = .84$, indicating good reliability. Farmer satisfaction was measured with a single item and thus had no alpha

value. These results suggest the scale’s dimensions consistently measure their intended constructs.

The internal consistency coefficients fall within or above the threshold for acceptable reliability ($\alpha \geq 0.70$), aligning with measurement standards in agricultural service evaluation research (Kassem *et al.*, 2021; Bishwakarma and Kattel, 2025). The

highest alpha for Relevance and Quality reflects the conceptual coherence of these items, similar to findings in extension satisfaction studies where content relevance drives consistent responses (Shaba and Alam, 2024). The slightly lower alpha for Accessibility and Inclusiveness may indicate more variability in farmers' experiences

across different locations, consistent with earlier observations of spatial inequities in service provision (Somanje *et al.*, 2021). Overall, the results confirm the reliability of the scale for assessing perceived service responsiveness among smallholder farmers in this context.

Table 5: Reliability coefficients (Cronbach's alpha) for agricultural service responsiveness scale

Subscale/Domain	Number of Items	Cronbach's Alpha (α)
Timeliness and Availability	2	.76
Relevance and Quality	2	.81
Accessibility and Inclusiveness	2	.72
Farmer Satisfaction (Single item)	1	
Overall PASRS Scale	7	.84

Note: $\alpha \geq 0.70$ indicates acceptable internal consistency. Farmer satisfaction is a single-item measure and therefore has no alpha.

Relationship Between Gender Inclusivity and Agricultural Service Responsiveness

As shown in Table 6, the Pearson correlation analysis revealed a significant positive relationship between the Gender Inclusivity Index (GII) and Agricultural Service Responsiveness ($r = .52, p < .01$). This indicates that higher levels of gender inclusivity in agricultural service access were associated with greater perceived responsiveness of agricultural services among smallholder farmers.

The positive association between gender inclusivity and agricultural service responsiveness suggests that equitable access to agricultural services enhances farmers' perception of service quality and timeliness. This aligns with Quaye *et al.* (2017), who observed that gender-responsive extension delivery improves communication, trust, and service

utilization. Ragasa *et al.* (2013) similarly reported that when extension systems address gender barriers, farmers, particularly women, perceive services as more relevant and supportive. The finding may be linked to the fact that inclusive service models tend to incorporate diverse perspectives, resulting in more tailored interventions, as supported by Asare *et al.* (2025). The relationship also reflects evidence from Phiri *et al.* (2022) that gender inclusivity strengthens participation in agricultural decision-making, which may influence satisfaction with service delivery. Conversely, contexts with persistent gender disparities often experience lower satisfaction with agricultural services, as shown in Dick and Ouko (2024). This finding therefore underscores the role of gender mainstreaming in improving the responsiveness of agricultural service systems.

Table 6: Correlation matrix of gender inclusivity and agricultural service responsiveness (n = 300)

Variables	1	2
1. Gender Inclusivity Index (GII)		
2. Agricultural Service Responsiveness	.52**	

Note: Pearson correlation coefficients reported.
 p < .01

Table 7 shows that the regression model was statistically significant, $F(1, 298) = 82.83$, $p < .001$, with gender inclusivity explaining 27% of the variance in agricultural service responsiveness ($R^2 = .27$). The Gender Inclusivity Index was a significant positive predictor ($B = 0.57$, $SE = 0.06$, $\beta = .52$, $t = 9.10$, $p < .001$), indicating that for every one-unit increase in gender inclusivity, agricultural service responsiveness increased by 0.57 units.

The regression analysis confirms that gender inclusivity is a substantial predictor of perceived agricultural service responsiveness. This supports the argument of Melissa *et al.* (2024) that making agricultural services gender-responsive directly enhances their effectiveness and farmer engagement. The explanatory power of the model suggests that inclusivity measures, such as targeted training and

equitable participation opportunities, can meaningfully improve service delivery outcomes. These results are consistent with Bishwakarma and Kattel (2025), who found that diversity-sensitive agricultural programs tend to receive higher satisfaction ratings from farmers. Furthermore, the magnitude of influence observed mirrors the findings of Asanwana and Uloh (2025a), who linked gender-responsive extension policies to improved service accessibility and effectiveness. The results also resonate with Botreau and Cohen (2020), who emphasized that closing gender gaps in agricultural resource access contributes to more equitable and efficient service provision. The implication is that policy interventions aimed at strengthening gender inclusivity could yield measurable gains in service responsiveness and farmer satisfaction.

Table 7: Linear regression of agricultural service responsiveness on gender inclusivity (n = 300)

Predictor	B	SE B	β	t	p-value
(Constant)	1.98	0.21		9.43	< .001
Gender Inclusivity Index	0.57	0.06	.52	9.10	< .001**
Model Summary					
R ²	.27				
F(1, 298)	82.83				
p (Model)	< .001				

Note: Dependent Variable = Agricultural Service Responsiveness.
 p < .01

4.0 Conclusion

The study found moderate to high levels of gender inclusivity in agricultural service access, with notable strengths in household decision-making and confidence in engaging extension agents, but persistent gaps in access to credit, farm inputs, and community-level decision-making. Perceptions of agricultural service responsiveness were generally positive, particularly for respectful treatment and relevance of information, though accessibility challenges, especially for female farmers, remain. Statistical analysis confirmed a significant positive relationship, with gender inclusivity explaining a substantial proportion of the variance in perceived service responsiveness. These findings highlight that equitable access to agricultural resources and decision-making opportunities enhances farmers' perceptions of service quality and effectiveness.

5.0 Recommendations

Based on the findings of this study, the following recommendations are made:

1. Expand equitable access to resources by addressing institutional barriers to credit, farm inputs, and land ownership for female farmers through targeted financing schemes and gender-sensitive input distribution.
2. Enhance community-level participation by adopting inclusive decision-making frameworks that ensure both male and female farmers are consulted on agricultural development initiatives.
3. Improve service accessibility through location-sensitive outreach models, mobile extension services,

and infrastructural investments to reach underserved and remote farming communities.

4. Sustain gender-mainstreaming in extension delivery by strengthening capacity-building programs for extension agents on gender responsiveness, ensuring equitable participation in training and demonstrations.
5. Integrate inclusivity monitoring into agricultural service evaluation frameworks to track progress, identify emerging gaps, and guide adaptive policy interventions.

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