

UTILIZATION OF PUBLIC AND PRIVATE AGRICULTURAL ADVISORY SERVICES AMONG WOMEN FARMERS IN SOUTHWESTERN NIGERIA

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ABSTRACT

Utilization of Agricultural Advisory Services (AAS) is essential for improving agricultural productivity; however, women farmers often face constraints in accessing and effectively using these services. This study examined the utilization of public and private agricultural advisory services among women farmers in Southwestern Nigeria. A multi-stage sampling procedure was used to select 307 respondents. Primary data were collected through a structured questionnaire covering socioeconomic characteristics, types of AAS available, delivery methods, level of utilization, and constraints. Data were analyzed using descriptive statistics, logit regression, and analysis of variance (ANOVA). Mean age of respondents was 46.99 ± 12.22 years, with an average household size of 6.63 ± 2.93 persons. Value addition in maize (65.8%) was the most available services under public and digital marketing (75.2%) under private sector AAS. More than half (54.5%) of public AAS users recorded low utilization. Cash shortage and high cost of inputs were major constraints. Group delivery method ($\beta=2.50$) and monthly income ($\beta=0.01$) significantly influenced utilization of public and private AAS, respectively. The study recommended the need to strengthen participatory delivery approaches and improve women's income capacity to enhance effective utilization of agricultural advisory services.

Keywords: Agricultural extension; delivery system; service providers; advisory services; utilization

INTRODUCTION

Agricultural advisory services comprise an institutional system that allow farmers and their organizations access relevant knowledge, information, and technologies, while fostering linkages with research, educational institutions, agribusinesses, and other key stakeholders, in order to enhance farmers' technical, organizational and mana-

gerial capacities and improve agricultural practices (Agwu *et al.*, 2023). Access to Agricultural Advisory Services (AAS) enhances farmers' productivity, facilitates market linkages, and enables them to leverage entrepreneurial opportunities (Fokou *et al.*, 2020). The era when government extension agencies served as the sole providers of AAS has passed. Currently, both public and private

organizations are actively involved in the delivery of advisory services. Major AAS providers include public institutions, agro-dealers such as farm input suppliers, off-takers, consultancy firms, and financial institutions as well as producer organizations, non-governmental organizations (NGOs), interest groups, community-based organizations, faith-based organizations and private farm consultants (USAID, 2019).

Although women play a critical role in agricultural production and household food security, their access to agricultural advisory services (AAS) and effective utilization remain limited. Existing studies have extensively examined women's contributions to agriculture and food security outcomes; however, there is insufficient empirical evidence on their capacity to utilize public and private agricultural advisory services effectively. This knowledge gap is problematic because limited access to and utilization of AAS may constrain women's productivity, income generation, and contribution to achieving Sustainable Development Goals 1 and 2. Without clear evidence on women farmers' access to AAS, their level of utilization and the constraints they face, policy interventions may remain inadequately targeted. Therefore, there is a need to critically examine level of women farmers' access to utilization of public and private agricultural advisory services and constraints encountered in order to inform more gender-responsive advisory systems.

Specific objectives

- i. To describe the social-economic attributes of women farmers utilising public and private AAS.
- ii. To ascertain the nature (types and delivery methods) of advisory services available to women farmers in the study area;
- iii. To determine levels of utilization of public and private AAS by women farmers in the study area;
- iv. To ascertain the constraints faced by women farmers in utilising public and private agricultural AAS in the study area.

Hypotheses of the study

- i. There is no significant contribution of selected independent variables to utilization of agricultural advisory services.
- ii. There is no significant difference in the utilization of AAS among the respondents across the service providers.

METHODOLOGY

Study Area

The study was conducted in Southwest Nigeria. The Southwest geopolitical zone comprises six states: Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo. The zone is known for its commercial and trading activities and serves as a major hub for the production of staple crops. It is also endowed with solid minerals and other natural resources (Nigerian Extractive Industries Transparency Initiative, 2020). Both public and private agricultural advisory services operate actively within the zone. Geographically, the region lies between longitude 2°30'E and 6°30'E and latitude 6°00'N and 9°00'N (Akinyemi *et al.*, 2020).

Sampling Procedure and Sample Size

A five-stage sampling procedure was used to select respondents utilising public agricultural advisory services (AAS). Stage 1: Two states (Lagos and Osun) were randomly selected from the six states in Southwest Nigeria. Stage 2: One senatorial district was randomly selected from each state: Lagos East Senatorial District and Osun West Senatorial District. Stage 3: Local Government Areas

(LGAs) were proportionately selected from the chosen senatorial districts. In Osun West, Ede South and Ejigbo LGAs were selected (20% of LGAs), while in Lagos East, Ikorodu and Ibeju-Lekki LGAs were selected (40% of LGAs), in all four local governments were randomly selected (Table 1). Stage 4: Thirty percent of the wards in each selected LGA were randomly chosen, which gave a total of 14 wards. Stage 5: Twenty percent (126) of the registered women farmers under the Agricultural Development Programme (ADP) and FADAMA in the selected wards were randomly selected and interviewed.

For private agricultural advisory services, purposive sampling was used to select prominent private AAS providers operating in the study area. In Lagos State, a compiled list of 77 women farmers accessing advisory services from Life Plus and Caritas Nigeria was obtained, and 50% were proportionately selected. In Osun State, 10.5% (45) of the 428 registered women farmers under Justice, Development and Peace Makers Centre (JDPMC) were selected.

97 respondents who utilized both public and private sources of AAS were identified during the survey and purposively included in the study. In total, 307 women farmers were interviewed (Table 1).

Data Collection

Both quantitative and qualitative data were collected. Primary quantitative data were obtained through the administration of a structured questionnaire to selected women farmers. The questionnaire captured information on socio-economic characteristics, availability and utilization of public and private agricultural advisory services, and constraints affecting utilization.

For qualitative data, eight Focus Group Discussions (FGDs) were conducted among women farmers and their groups. Five Key Informant Interviews (KIIs) were conducted with leaders of women farmer groups and relevant stakeholders.

Data Analysis

Quantitative data were analysed using descriptive statistics such as frequencies, percentages, and means to address the study objectives. Hypotheses were tested using Student's t-test and logit regression analysis. Qualitative data from FGDs and KIIs were audio-recorded, transcribed verbatim into Microsoft Word, and analyzed thematically according to key discussion topics.

RESULTS AND DISCUSSIONS

Personal Characteristics of the Respondents

The overall mean age of respondents was 46.99 ± 12.22 years, indicating that most women farmers were economically active. Among private AAS users, 54.7% were aged 41–60 years; similarly, 54.8% of public AAS users and 71.2% of those using both services fell within this age range (Table 2) suggesting that middle-aged women with considerable farming experience predominantly access advisory services (Nwaiwu *et al.*, 2022). Across all categories, the majority (75.0% private, 81.0% public, 79.4% both) were married, reflecting rural social structures that may influence access to land, labour, and financial resources (Baloyi, 2022).

Educational attainment was generally low to moderate: 28.8% had no formal education, with post-secondary qualifications highest among private AAS users (23.8%) compared to public (9.5%) and both (12.4%). Low education may limit effective utilization of advisory services and adoption of technological

Table 1: Distribution of sampled respondents

Sources of AAS	Zone	Stage 1 Selected State	Stage 2 Selected (1) Senatorial Zone	Stage 3 Selected (2) LGAs in the Zones	Stage 4 Selected (30%) Wards in the LGA	Number of Registered Women Farmers in Selected Wards	Stage 5 Number of Selected Women Farmers (20%)
Public	South-West	Lagos	East	Ikorodu	Odoguyan, Imota/Gberigbe, Igbogbo Isiu	30 46 31 34	6 9 6 7
				Ibeju-Lekki	Ise Oniyanrin Orimedu Folu	43 46 33 45	9 9 7 9
		Osun	West	Ede South	Alajue 1 Alajue 2 Elesan Ifedapo	51 58 46	10 12 9
				Ejigbo	Ologege Ife-Odan Ejigbo	48 66 54	10 13 10
Sub-total						631	126
Private AAS Sources Respondents Selected States				Selected Private AAS Agencies		Number of Women Farmers Generated	Proportionate Sampling of Women Farmers (50%)
Lagos				Caritas Nigeria Ltd.		43	22
				Life Plus Foundation International		34	17
						Number of Registered Women Farmers	Proportionate Sampling of Women Farmers (10.5%)
Osun				JDPMC		428	45
Sub-total						510	84
Reconnaissance Survey (Purposive Selection)				Public and Private Sources Respondents (Both)			
Lagos							
Osun							
							97
Total							307

innovations (Zhou *et al.*, 2024). Key informant interviews confirmed generational differences in education: *Those of us that are aged did not have formal education but the younger ones among us have at least primary school certificate* (KII women leader, Alajue Ward 1, Osun State, 2024).

“Many of us are educated; for instance, I hold an MBA degree. Although there are a few members who lack education (KII with Madam A at Odogunyan ward 1 on 13/11/2024)”.

The mean household size was 6.63 ± 2.93 persons, with most respondents across categories having 5–8 members, providing family labour to support farm operations (Mukaila *et al.*, 2021). Mean monthly farm income was higher among private users (₦84,791.67) than public (₦73,580.36) or both (₦75,711.71), though a substantial proportion earned below ₦90,000. FGDs highlighted rising input costs as a key constraint.

Mean farming experience was 15.65 ± 11.30 years. Private AAS users were relatively newer farmers, while public and both-service users tended to have longer experience, consistent with evidence that farming experience positively influences utilization of new recommendations (Abioye *et al.*, 2025).

Availability of Agricultural Advisory Services

Variations in the availability of agricultural advisory services (AAS) across private, public, and combined service users were observed (Table 3). A larger proportion (79.8%) of respondents utilizing private AAS reported the availability of training on digital marketing of agricultural produce

compared with 50.0% of public AAS users and 42.3% of those accessing both sources (Table 3). This suggests that private advisory providers may place greater emphasis on market-oriented and digitally driven services, reflecting the increasing importance of digital platforms in improving farmers' market access and reducing intermediary exploitation (Izuogu *et al.*, 2023).

Regarding technical agricultural services, 73.8% of private AAS users reported the availability of training on best agronomic practices compared with 69.0% among public users and 58.8% among respondents accessing both sources. Training on integrated pest management was also more frequently reported among private users (61.9%) than public users (48.4%) and combined users (37.1%), indicating that both advisory systems provide core agronomic support, although private providers appear to emphasize production-related services more strongly.

Training on household food and nutrition security was widely available across the three groups. Among the respondents, 60.7% of private AAS users, 69.0% of public AAS users, and 58.8% of those accessing both sources reported receiving training on kitchen and nutrition gardening. Health-related advisory services were particularly prominent among public AAS users, including training on reproductive health (84.9%), HIV (86.5%), cancer (82.5%), and sexually transmitted diseases with 72.2% (Table 3). This indicates that advisory services extend beyond agricultural production to broader welfare and social development components, which may enhance women farmers' productivity and wellbeing (Folarin *et al.*, 2023). Focus Group Discussions further confirmed that extension officers sometimes collaborate with health personnel to deliver such training.

Table 2: Distribution of respondents according to socio-economic characteristics (n = 307)

Variables	Private	Public	Both sources	Private	Public	Both sources
	Percent	Percent	Percent	Mean / Std dev.	Mean / Std dev.	Mean / Std dev.
Age (years)						
< 31	19.0	12.7	6.2	$\bar{x} = 44.38$ ± 12.37	$\bar{x} = 46.48$ ± 12.86	$\bar{x} = 49.91$ ± 10.64
31 - 40	19.0	21.4	12.4			
41 - 50	35.7	28.6	28.9			
51 - 60	19.0	26.2	42.3			
>60	7.1	11.1	10.3			
Marital status						
Single	11.9	5.6	5.2			
Married	75.0	81.0	79.4			
Separated	3.6	4.0	3.1			
Divorced	3.6	1.6	3.1			
Widowed	6.0	7.9	9.3			
Highest educational attainment						
No formal Education	13.1	27.8	24.7			
Primary	11.9	26.2	13.4			
Secondary	28.6	33.3	37.1			
NCE/OND	23.8	9.5	12.4			
HND/B.Sc.	19.0	2.4	9.3			
M.Sc.	3.6	0.8	3.1			
Household size						
1-4 persons	35.7	11.9	16.5	$\bar{x} = 5.57$	$\bar{x} = 7.07$ ± 2.78	$\bar{x} = 6.97 \pm 3.51$
5-8 persons	57.1	67.5	64.9			
>8 persons	7.1	20.6	18.6	± 2.06		
Average monthly income from agric. Enterprise(₦)						
<30,000	20.2	27.7	18.6	$\bar{x} = 84791.7$ ± 72439.9 7	$\bar{x} = 73580.36$ ± 107093.1 8	$\bar{x} = 75711.71$ ± 90257.05
30,000-59,999	23.8	34.9	30.9			
60,000-89,999	19.0	12.7	23.7			
90,000 and above	36.9	24.6	26.8			
Farming experience						
<10 years	45.2	31.7	26.8	$\bar{x} = 11.94$ ± 8.90	$\bar{x} = 17.29$ ± 13.03	$\bar{x} = 16.71$ ± 10.05
10-19 years	31.0	26.2	27.8			
20-29 years	16.7	22.2	33.0			
>29 years	7.1	19.8	12.4			

Table 3: Types of Advisory Services Available to Respondents

Types of advisory services	Private		Public		Both sources	
	Not available	Available	Not available	Available	Not available	Available
	Percent	Percent	Percent	Percent	Percent	Percent
Digital marketing of agric. produce	20.2	79.8	50	50	57.7	42.3
Value addition - palm kernel	81.0	19.0	42.1	57.9	55.7	44.3
Value addition - cassava	52.4	47.6	28.6	71.4	41.2	58.8
Value addition - maize	45.2	54.8	29.4	70.6	38.1	61.9
Value addition – fish	44.0	56.0	42.1	57.9	64.9	35.1
Value addition – yam	67.9	32.1	42.9	57.1	44.3	55.7
Value addition – rice	76.2	23.8	56.3	43.7	58.8	41.2
AAS on integrated pest mgmt.	38.1	61.9	51.6	48.4	62.9	37.1
AAS on best agronomic practices	26.2	73.8	31.0	69.0	41.2	58.8
AAS on Farm inputs	25.0	75.0	33.3	66.7	47.4	52.6
AAS on HHFS on Kitchen & nutrition gardening	39.3	60.7	31.0	69.0	32.2	68.0
AAS on low-cost diet	35.7	64.3	36.5	63.5	41.2	58.8
AAS on development of high nutrition efficiency diet	39.3	60.7	34.1	65.9	41.2	58.8
AAS on storage minimisation technique	54.8	45.2	50.0	50.0	63.9	36.1
AAS on reproductive health	38.1	61.9	15.1	84.9	19.6	80.4
AAS on HIV	33.3	66.7	13.5	86.5	17.5	82.5
AAS on cancer	39.3	60.7	17.5	82.5	26.8	73.2
AAS on sexually transmitted diseases	40.5	59.5	27.8	72.2	44.3	55.7
AAS on Maternal health	33.3	66.7	23.8	76.2	45.4	54.6
AAS on Violence against women	41.7	58.3	29.4	70.6	46.4	52.6
AAS on mental health	31.0	69.0	27.8	72.2	53.6	46.4
AAS on Non-communicable diseases	39.3	60.7	32.5	67.5	51.5	48.5
AAS on Being young	41.7	58.3	33.3	66.7	61.9	38.1
AAS on Getting older	29.8	70.2	35.7	64.3	56.7	43.3

Delivery Methods Used by Public and Private Agricultural Advisory Service Providers

The delivery methods used by respondents to access agricultural advisory services (AAS), revealed notable differences between public and private providers (Table 4). Among respondents utilizing public AAS, most (84.9%) were reached through group-based methods. Within this category, 94.4% participated in group meetings, 86.0% received training through demonstrations, and 32.7% attended workshops or seminars. Only 8.7% reported individual-based services, mainly through office (54.5%) and telephone (45.5%) calls. Mass media (76.2%) was also widely used, particularly radio (95.8%) and flyers (4.2%). This dominance of group approaches reflects the conventional public extension model in Nigeria, where limited manpower and financial resources encourage the use of cost-effective methods that reach large numbers of farmers simultaneously (Abbas *et al.*,

2021).

In contrast, private AAS delivery was more intensive and diversified. Over half (54.8%) of the respondents received individual-based services, with farm visits reported by all (100%) respondents in this category. Telephone calls (91.3%) and office calls (26.1%) were also common. Group-based activities (78.9%) were also reported, particularly demonstrations and workshops/seminars (100% each). Mass media (94.0%) exposure was high, mainly through radio (83.5%) and flyers (63.3%).

Among respondents accessing both sources, group-based methods (87.6%) were predominant, especially demonstrations (91.8%) and workshops/seminars (76.5%). Mass media exposure was also high (83.5%), highlighting radio as a key channel for disseminating agricultural information across all service categories (Table 4).

Table 4: Delivery method used by service providers (n = 307)

Delivery methods	Private source		Public source		Both sources	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Individual	46	54.8	11	8.7	5	5.2
Farm visit	46	100.0	-	-	5	100.0
Office calls	12	26.1	6	54.5	-	-
Telephone calls	42	91.3	5	45.5	-	-
Group	62	78.9	107	84.9	85	87.6
Group meetings	15	24.2	101	94.4	29	34.1
Demonstration	62	100.0	92	86.0	78	91.8
Workshops/seminars	62	100.0	35	32.7	65	76.5
Mass media	79	94.0	96	76.2	81	83.5
Radio	66	83.5	92	95.8	72	88.9
flyer	50	63.3	4	4.2	45	55.6

Level of utilization of public and private agricultural advisory services

Highlighting the varying levels of utilization of agricultural advisory services among women farmers who accessed public and private providers, specifically, services such as value addition on rice, low utilization rates were observed (Table 5), with mean scores of 0.39 and 0.85 for respondents who accessed private and public AAS, respectively. In contrast, advisory services related to digital agricultural marketing were highly utilized, among women farmers who accessed private AAS ($\bar{x} = 2.11$), among public AAS users ($\bar{x} = 1.45$), and among those who accessed both private and public AAS ($\bar{x} = 0.94$) - Table 5.

Training on household food security, including kitchen and nutrition gardening, recorded medium levels of utilization across the board. The mean scores were 1.49 for private AAS users, 1.54 for public AAS users, and 1.43 for those who accessed both sources. Advice on low- or minimum-cost diets had mean values of 1.24 among respondents who used private AAS, 1.34 among public AAS users, and 1.30 among those who utilized both sources. Overall, these results indicate a medium level of utilization for most services.

Regarding health-related advisory services such as reproductive health, HIV, cancer, and sexually transmitted diseases respondents who accessed private AAS recorded medium levels of utilization, with mean values ranging from 1.00 to 1.45. Similarly, respondents who used public sources or both public and private sources exhibited medium mean values ranging from 1.00 to 1.64 (Table 5). This suggests moderate exposure to health-related training among the women farmers. These findings indicate

that women are increasingly recognizing health as a crucial determinant of their agricultural productivity. Folarin *et al.* (2023) reported that the health status of women farmers significantly affects their agricultural productivity, underscoring the need for policies that improve women's health and working conditions. The FGD session with respondents in the study area buttressed this result; *we received more advisory services on health-related issues from agricultural expertise, and sometimes they invite us from the health centre for training* (FGD, Women in Agriculture, Elesan Village, Osun State, 2024).

Constraints toward utilizing agricultural advisory services

Women farmers encountered notable constraints in utilizing Agricultural Advisory Services (Table 6). Among respondents who used public AAS, the major constraints were cash shortage ($\bar{x} = 1.83$) and high input costs ($\bar{x} = 1.77$). Similarly, respondents who accessed both public and private AAS reported cash shortage ($\bar{x} = 1.87$) and high input costs ($\bar{x} = 1.80$) as their most severe challenges. The major constraint for respondents relying solely on private AAS included high input costs ($\bar{x} = 1.76$), cash shortage ($\bar{x} = 1.75$), and domestic responsibilities ($\bar{x} = 1.29$) - Table 6. These findings suggest that financial limitations particularly cash shortages and rising input costs were common constraints across all categories of respondents. Increasing input costs have posed significant challenges to agricultural production in recent years. According to Okojie (2023), high input prices often compel farmers to reduce the size of land cultivated, thereby aggravating food insecurity. Limited financial resources therefore restrict farmers' ability to adopt advisory recommendations or utilize AAS effectively. Respondents reported limited contact with advisory service providers,

which could otherwise help mitigate production challenges. Adebayo and Worth (2024) similarly observed that women farmers frequently have limited interaction with extension agents. Evidence from the Key Informant Interview further highlighted the burden of rising input costs on women farmers' capacity to implement acquired agricultural innovations. This result is corroborated by contents of the KII conducted as exemplified thus: *Frequent increase in price of inputs particularly fuel is really a challenge. I had a training on how to produce odourless fufu powder, but could not continue production because of the cost involved in drying and grinding mechanically* (KII, women leader, Ebute Ikorodu, 2024).

Regression analysis on contribution of selected independent variables to utilization of agricultural advisory services

Factors influencing women farmers' utilization of agricultural advisory services (AAS) across service categories were identified (Table 7). Among respondents using private AAS only, age ($\beta = 0.111$), income ($\beta = 0.010$), and the individual method of service delivery ($\beta = 2.064$) positively influenced utilization, indicating that older and higher-income women, as well as those receiving personalized advisory interactions, were more likely to use private services.

For respondents relying solely on public AAS, the group delivery method ($\beta = 2.498$) significantly enhanced utilization, highlighting the importance of collective approaches in public extension systems. However, constraints negatively affected utilization ($\beta = -2.287$), reflecting barriers such as cash shortage, high input costs, and domestic responsibilities.

Among respondents accessing both public and private AAS, income ($\beta = 0.021$) and

the group delivery method ($\beta = 2.309$) positively influenced utilization, while constraints ($\beta = -2.493$) had a strong negative effect.

Overall, group delivery method ($\beta = 0.728$), age ($\beta = 0.023$), and income ($\beta = 0.047$) were positive and significant predictors of AAS utilization, while constraints ($\beta = -0.456$) reduced utilization (Table 7). These findings suggest that group-based advisory approaches, such as farmer associations and cooperatives, enhance participation by facilitating knowledge sharing and peer support, which is consistent with Barongo (2021).

Difference in utilization of agricultural advisory services among the three categories of respondents

A significant difference in the utilization of agricultural advisory services was noted among the three categories of women farmers based on the type of extension services accessed ($F = 12.54$) - Table 8. Post-hoc results (Table 9) indicate that respondents who utilized private extension services recorded the highest utilization score ($\bar{x} = 35.61$), followed by those who accessed both public and private services ($\bar{x} = 30.80$), while respondents relying solely on public extension services had the lowest mean score ($\bar{x} = 24.85$).

The higher utilization among private service users suggests that private advisory systems may provide more responsive, client-oriented and timely services tailored to farmers' needs. Women who accessed both service types also showed relatively high utilization, possibly due to the complementary benefits derived from combining different advisory sources. In contrast, the lower utilization observed among users of public extension services alone may reflect institutional challenges such as limited funding, inade-

Table 5: Utilization of agricultural advisory services by public and private respondents (n = 307)

Agricultural advisory services	Private (%)				Public (%)				Both sources (%)						
	Never	Rarely	Occasionally	Always	Mean	Never	Rarely	Occasionally	Always	Mean	Never	Rarely	Occasionally	Always	Mean
Digital marketing of agric. Produce	11.9	11.9	29.8	46.4	2.11	37.3	10.3	22.2	30.2	1.45	55.7	8.2	22.7	13.4	0.94
Value addition - palm kernel	81.0	2.4	10.7	6.0	0.42	48.4	9.5	20.6	21.4	1.15	47.4	8.2	15.5	28.9	1.26
Value addition – cassava	45.2	16.7	22.6	15.5	1.08	34.9	12.7	21.4	31.0	1.48	35.1	12.4	15.5	37.1	1.55
Value addition – maize	19.0	20.2	36.9	23.8	1.66	31.7	11.9	30.2	26.2	1.51	32.0	11.3	22.7	34.0	1.59
Value addition – fish	26.2	13.1	31.0	29.8	1.64	39.7	15.1	16.7	28.6	1.34	40.2	20.6	18.6	20.6	1.20
Value addition – yam	72.6	2.4	14.3	10.7	0.6	46.0	12.7	19.0	22.2	1.18	44.3	13.4	17.5	24.7	1.23
Value addition – rice	81.0	4.8	8.3	6.0	0.39	64.3	5.6	11.1	19.0	0.85	55.7	9.3	12.4	22.7	1.02
AAS on integrated pest mgmt.	20.2	14.3	33.3	32.1	1.77	50.8	13.5	15.1	20.6	1.06	61.9	16.5	13.4	8.2	0.68
AAS on best agronomic practices	16.7	16.7	28.6	38.1	1.88	38.1	17.5	19.8	24.6	1.31	39.2	16.5	20.6	23.7	1.29
AAS on Farm inputs	11.9	26.2	14.3	47.6	1.98	32.5	18.3	27.8	21.4	1.38	48.5	15.5	18.6	17.5	1.05
AAS on HHFS on Kitchen & nutri-	36.9	6.0	28.6	28.6	1.49	28.6	15.1	30.2	26.2	1.54	24.7	22.7	37.1	15.5	1.43
AAS on low minimum cost diet	45.2	9.5	21.4	23.8	1.24	35.7	15.9	27.0	21.4	1.34	33.0	21.6	27.8	17.5	1.30
AAS on development of high nutri-	39.3	7.1	29.8	23.8	1.38	30.2	15.9	29.4	24.6	1.48	30.9	22.7	30.9	15.5	1.31
AAS on storage minimisation tech-	36.9	10.7	14.3	38.1	1.54	46.0	11.1	15.9	27.0	1.24	51.5	7.2	22.7	18.6	1.08
AAS on reproductive health	33.3	9.5	35.7	21.4	1.45	23.0	15.9	35.7	25.4	1.64	40.2	6.2	35.1	18.6	1.32
AAS on HIV	34.5	9.5	31.0	25.0	1.46	25.4	15.1	33.3	26.2	1.60	50.5	9.3	34.0	6.2	0.96
AAS on cancer	41.7	8.3	27.4	22.6	1.31	31.7	14.3	31.0	23.0	1.45	49.5	10.3	30.9	9.3	1.00
AAS on sexually transmitted diseases	52.4	8.3	26.2	13.1	1.00	34.9	16.7	27.8	20.6	1.34	44.3	23.7	27.8	4.1	0.92
AAS on Maternal health	50.0	8.3	25.0	16.7	1.08	32.5	15.9	31.0	20.6	1.39	56.7	16.5	23.7	3.1	0.73
AAS on Violence against women	57.1	9.5	17.9	15.5	0.92	38.9	13.5	27.0	20.6	1.29	55.7	17.5	24.7	2.1	0.73
AAS on mental health	52.4	13.1	15.5	19.0	1.01	42.1	17.5	25.4	15.1	1.14	56.7	20.6	20.6	2.1	0.68
AAS on Non-communicable diseases	51.2	11.9	21.4	15.5	1.01	39.7	12.7	30.2	17.5	1.25	59.8	15.5	23.7	1.0	0.66
AAS on Being young	61.9	8.3	16.7	13.1	0.81	47.6	15.1	21.4	15.9	1.06	58.8	16.5	24.7	-	0.66
AAS on Getting older	60.7	7.1	17.9	14.3	0.86	43.7	18.3	23.8	14.3	1.09	47.4	22.7	25.8	4.1	0.87

quate personnel and weak outreach to women farmers.

These findings highlight the need to strengthen public extension systems through improved funding, capacity build-

ing and gender-sensitive approaches. Encouraging collaboration between public and private extension providers could also enhance service delivery and improve women farmers' access to effective advisory support (FAO, 2021).

Table 6: Distribution of constraints toward utilizing AAS by the respondents (n = 307)

S/NO	Constraints	Private			Public			Both sources		
		Not a challenge	Mild challenge	Serious challenge	Mean	Not a challenge	Mild challenge	Serious challenge	Mean	Mean
		Percent	Percent	Percent		Percent	Percent	Percent		
1	Small land size	33.3	11.9	54.8	1.21	31.0	19.0	50	1.19	1.19
2	Shortage of cash	10.7	3.6	85.7	1.75	5.6	5.6	88.9	1.83	1.87
3	Cultural influences	57.1	15.5	27.4	0.70	41.3	23.8	34.9	0.94	0.84
4	Lack of female extension workers	63.1	10.7	26.2	0.63	47.6	25.4	27.0	0.79	0.72
5	High cost of inputs	10.7	2.4	86.9	1.76	7.1	8.7	84.1	1.77	1.80
6	Lack of easy access to AAS	45.2	6.0	48.8	1.04	24.6	17.5	57.9	1.33	1.05
7	Domestic duties	31.0	8.3	60.7	1.29	38.1	7.1	54.8	1.17	1.11

Table 7: Predictors of utilization of advisory services among women farmers

	β Private	Wald	P	B Public	Wald	P	β Both	Wald	P	β Aggregate	Wald	P
Age	0.111	2.558	0.041*	-0.023	0.978	0.323	0.041	2.230	0.135	0.023	3.153	0.021*
Marital status	-1.287	0.199	0.075	0.345	0.570	0.708	0.648	1.437	0.231	-0.104	0.120	0.729
Education	1.218	0.362	0.067	-0.357	0.237	0.627	0.588	1.014	0.314	0.419	1.370	0.124
Family size	0.094	0.350	0.554	0.026	0.116	0.733	-0.052	0.606	0.436	0.047	1.044	0.307
Income	0.010	3.011	0.018*	0.020	0.247	0.619	0.021	3.288	0.032*	0.025	3.069	0.000*
Farming experience	0.004	0.010	0.919	0.003	0.016	0.900	0.019	0.027	0.489	0.017	1.457	0.227
Individual	2.064	3.353	0.047*	0.187	0.254	0.087	-0.13	0.014	0.905	0.267	0.193	0.638
Mass	0.904	0.669	0.413	1.160	1.791	0.095	0.890	1.629	0.105	0.344	0.790	0.374
Group	0.137	0.635	0.791	2.498	7.406	0.007*	2.309	4.521	0.003*	0.728	5.199	0.000*
Constraint	-0.027	0.983	0.098	-2.287	4.484	0.034*	-2.49	4.568	0.000*	-0.456	3.555	0.036*
Constant	2.209	2.481	0.110	0.594	0.231	0.631	3.070	5.144	0.046	2.714	12.952	0.000
	-2Log likelihood =97.009; Cox & Snell R ² =0.190; Nagelkerke R ² =0.255 -2Log likelihood =134.508; Cox & Snell R ² =0.165; Nagelkerke R ² =0.220 -2Log likelihood =139.125; Cox & Snell R ² =0.116; Nagelkerke R ² =0.155 -2Log likelihood =386.405; Cox & Snell R ² =0.118; Nagelkerke R ² =0.157											

Table 8: Difference in utilization of agricultural advisory services by the respondents (n = 307).

	Sum of squares	df	Mean square	F	p
Between groups	5858.193	307	2929.10	12.54	0.000
Within groups	70988.211		233.51		

S = significant at 0.05 significant level

Table 9: Duncan Post-Hoc Test showing difference in the mean of utilization level across agricultural advisory service types accessed by women farmers

Agricultural extension service types	N	1	2	3
Private	84			35.61
Both	97		30.80	
Public	126	24.85		

CONCLUSION

The study concluded that income and group delivery method play a critical role in shaping the farming practices of women farmers who utilized AAS through private, public agencies and both sources.

Women farmers utilizing AAS struggled with high costs of inputs and cash shortages, but more importantly, public AAS users were also faced with limited access to advisory services.

RECOMMENDATIONS

Since all the categories of women-farmers face significant financial barriers, such as high input cost and cash shortage, it is recommended that both public and private AAS providers work closely with financial institutions to facilitate access to affordable credit and microfinance schemes among women-farmers.

AAS agencies should strengthen group-based approaches and community-centered training that ensure that women with heavy domestic responsibilities can still participate in AAS effectively.

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