MOOR JOURNAL OF AGRICULTURAL RESEARCH
Journal homepage: https://iart.gov.ng/moorjournal/index.php/mjar/

Barriers to Accessing Farmers' Helpline Services among Smallholder Farmers in Oyo State, Nigeria

[1]Amusat, A. S., [2]Binuomote, O. K. and [3]Omirin, T. I.

[1]Institute of Agricultural Research and Training, Obafemi Awolowo University, Moor Plantation, Ibadan, Nigeria.
[2]Department of Agriculture, University of Ilesa, Osun State.
[3]Department of Agricultural Extension and Rural Development, University of Ibadan, Nigeria

Article Info

Article history:
Received: June 9, 2026
Revised: July 27, 2026
Accepted: July 29, 2026

Keywords:
Smallholder farmers
Helpline services
Digital extension
Agricultural information
Barriers to access

Abstract

Digital extension services such as farmers' helpline centres are key to improving access to agricultural information and complement the efforts of traditional extension systems. This study examined barriers to accessing farmers' helpline services among smallholder farmers in Oyo State, Nigeria. Adopting a multi-stage sampling procedure, a total of 148 smallholder farmers were sampled. Data were collected from smallholder farmers using questionnaires. Descriptive analyses showed that respondents were mostly male (75.6%), middle-aged ($\bar{x}$=51.80±9.11 years), and quite experienced in farming ($\bar{x}$=12.58±4.03 years). Awareness of helpline services was generally high, especially relating to accessibility irrespective of location (86.7%) and free cost of services (84.4%), however contact via information channels was limited, with prominent channels being farmers' associations ($\bar{x}$=0.90±0.60) and fellow farmers ($\bar{x}$=0.71±0.59). Majority (62.2%) of farmers exhibited a favourable attitude towards helpline services, while key barriers to access were inconsistency in the operation of the helpline centre ($\bar{x}$=1.93±0.25), poor knowledge about the services of the centre ($\bar{x}$=1.86±0.45), and insufficient sensitisation of helpline services ($\bar{x}$=1.84±0.47). Despite the high awareness and favourable attitude of the respondents towards helpline services, institutional and knowledge-related barriers largely hindered respondents' access to helpline services. Therefore, consistency in service delivery and intensified sensitisation via trusted information channels should be ensured to enhance smallholder farmers' effective access to helpline services.

Introduction

Agriculture is critical to the economy of developing countries where a large portion of the population relies on crop cultivation or rearing of animals for sustenance. Globally, smallholder farmers play a crucial role in agricultural development (Yuan *et al*., 2024). In Nigeria, smallholder farmers produce the bulk of food that are consumed domestically, underscoring their pivotal role to national agricultural development. However, poor access to agricultural information needed to effectively guide decision-making on the farm continues to limit the productivity of smallholder farmers.

Corresponding author: Tel: +2348066683531
Email address: topeomirin@gmail.com, (T. I. Omirin)
1595 – 4153 Copyright © 2025 MJAR

Access to requisite information across the agricultural value chain (i.e. production practices, use of input, control of pests and diseases, variations in weather, availability of market) is important to enhance productivity, reduce risks, and improve the livelihood of farmers. This consequently makes access to timely agricultural information important to strengthen the resilience of farmers and sustainability of agricultural development (Food and Agricultural Organization, 2023), which is achievable through extension service delivery.

Traditionally, agricultural extension services have functioned as a means for disseminating knowledge and technology from research institutions to farmers' fields, thus playing a pivotal role in improving

agricultural productivity and promoting sustainable practices. Such transferred knowledge/technology helps in the improvement of technical and managerial capacities of farmers, as well as offer advisory support geared towards increasing farm productivity and the welfare of rural people (FAO, 2023). Providers of extension services make an innovation known to farm households, act as catalysts to the adoption rate and also control change and attempt to prevent some individuals in the system from discontinuing the diffusion process (Gega, 2024). Despite these benefits, conventional extension is hindered in its effective delivery of services by inadequate number of personnel, weak logistics and mobility, little incentives, and poor institutional support (Ojo *et al*., 2024). These challenges have hindered the effective dissemination of agricultural information to farmers, thereby requiring the need for a more accessible and scalable alternative.

Advancements in Information and Communication Technologies (ICTs) offer possibilities for tackling some of the inadequacies connected with traditional extension. *The potency of modern electronic technology can be harnessed to disseminate information to farming communities* (Bashir *et al*., 2021). The provision of advisory services in agriculture is progressively moving towards the use of digital technologies which are capable of simultaneously reaching larger farming communities at lower costs. Digital extension advisory systems such as radio, television, mobile phones, short message services (SMS), interactive voice response (IVR), video clips and so on can be optimized and complement conventional extension for the delivery of agricultural information and enhance farmers' access to extension services (FAO, 2023). Naveed (2021) identified agricultural information dissemination service as critical in the implementation of agricultural information. Similarly, Mukherjee *et al*. (2025) observed that ICT tools improve farmers' access to agricultural information and enable faster and more efficient dissemination of information**.** Digital extension systems are therefore important to support the productivity of smallholder farmers, given their capacity to reduce barriers in terms of geography and make communication more efficient.

In an attempt to address improved dissemination of agricultural information in Nigeria, the National Farmers' Helpline (NFHL) centre was established in 2017 by the Federal Ministry of Agriculture and Food Security to strengthen the delivery of agricultural extension services across the six geopolitical zones of the country. The creation of the farmers' helpline was to complement traditional conventional extension services, since traditional extension system which involves physical contact of extension agents with farmers is unable to satisfy the demands of farmers (NAERLS, n.d.). The NFHL is an agricultural/ICT-based call centre through which farmers are provided with a variety of real-time agricultural information and advisory services free of charge. The helpline operates through the use of a mobile-based communication systems e.g. via phone calls, Short Message Service (SMS), and web-based platforms. WhatsApp messaging and IVR are other examples of mobile-based forms of communication. Advisory services are currently available in English and major Nigerian languages, including Hausa, Yoruba and Igbo, to improve accessibility for farmers. The Helpline operates Monday to Friday from 9:00 a.m. to 4:00 p.m. Farmers can access a broad range of advisory services guidance on crops, livestock, improved agronomic practices, irrigation, weather information, markets, and other information related to farming through the helpline irrespective of their location.

Despite the relevance of digital agricultural extension and advisory services, evidence indicate that access of such services by farmers is not guaranteed by mere awareness and availability. Socio-economic, institutional, and infrastructural barriers often limit their access. Research has acknowledged poor digital literacy/skill, lack of trust, poor infrastructure/network, affordability constraints, weak service provision, and socio-cultural factors as major barriers limiting the engagement of farmers with digital extension platforms (FAO, 2023; Ajambo *et al*., 2024). This suggests that even when farmers are aware of helpline services, certain fundamental barriers may hinder their access to such services.

Though majority of farmers now own mobile phones, and agricultural information is increasingly being disseminated through digital platforms, there is

insufficient understanding of the challenges affecting smallholder farmers' access to agricultural helpline services. While existing empirical evidence in Nigeria has mainly concentrated on the dissemination of agricultural information and adoption of ICT, there is little specific focus as regards farmers' helpline services and the factors hindering their access. It therefore becomes imperative to understand the barriers hindering smallholder farmers' access to helpline services, as this would not only strengthen agricultural extension and advisory service delivery but also ensure that farmers derive full benefits from investments made in digital extension platforms. In the light of the above, this study examined the barriers to accessing helpline services among smallholder farmers in Oyo State.

Objectives of the study:

1. To assess smallholder farmers' awareness of helpline services;
2. To identify smallholder farmers' channels of information on helpline services
3. To examine smallholder farmers' attitude towards helpline services;
4. To ascertain the barriers to smallholder farmers' access of helpline services.

Materials and Methods

Study area: This research was carried out in Oyo State, Southwestern Nigeria. Oyo State is predominantly agrarian, characterised by rainforest and derived savannah vegetation. Farmers in the state cultivate different types of crops such as cassava, maize, yam, rice, plantain, vegetables, cocoa, oil palm. Livestock production activities include poultry (chicken and turkey), goats, sheep.

Sampling method and sample size: Smallholder farmers, i.e. farmers who operate relatively small-sized farms, typically less than two hectares, depend largely on family labour, and often have limited access to productive resources, markets, and support services, constituted the study population. The study adopted a multi-stage sampling procedure. The first stage the purposive selection of two agricultural zones (Ogbomoso and Ibarapa zones) due to their history of participation in agricultural extension activities and their active involvement in IAR&T outreach programmes**.** In the second stage, one Local Government Area (LGA) was purposively selected from each zone (Orire LGA from Ogbomoso zone and Ibarapa East LGA from Ibarapa zone) based on the presence of established agricultural outreach activities. Subsequently, Oniyo community in Orire LGA and Aborisade community in Ibarapa East LGA were selected because they are among the Agricultural Research Outreach Centres (AROC) or adopted villages established by IAR&T, where farmers have received extension support over the years. Thus, farmers in the two selected communities constituted the study population. In the final stage, 74 farmers were randomly selected from each community, giving a total sample size of 148 respondents. Data were collected using a structured questionnaire.

Measurement of variables: The objectives were operationalised as follows: Respondents' characteristics (e.g. age, sex, education, farming experience, phone ownership, ability to send SMS) were measured at appropriate level, including nominal, ordinal and interval levels. Awareness of helpline services was measured using a two-point scale (yes = 1, no = 0) across eight services rendered by the NFHL. Based on percentage scores, awareness was rated as high (≥50%) or low (<50%). Channels of information on helpline services were measured using a three-point scale (always = 2, occasional = 1, and not at all = 0) across seven channels. Weighted mean scores less than 1 denoted less frequently used information channel, while scores equal or greater than 1 denoted more frequently used information channel. Measurement for attitude towards helpline services was done using a five-point Likert scale (strongly disagree = 1, disagree = 2, undecided = 3, agree = 4, and strongly agree = 5 for negative items, while scale points were reversed for positive items) across twelve statements revealing attitude. The maximum obtainable score was 60, while the minimum obtainable score was 12. The mean index was generated (37.87±3.79) and used to categorise respondents into favourable (≥ mean) and unfavourable (< mean) attitude towards helpline services. Additionally, barriers to access of helpline services were measured using a three-point scale (serious constraint = 2, mild constraint = 1, and not a constraint = 0) across nine items. Weighted mean scores less than

1 indicated less serious barrier, while more than 1 indicated serious barriers.

Data analysis: Data analysis (percentages, mean scores and standard deviation) was done using Version 21 of the SPSS software.

Results and Discussion

Sample characteristics of smallholder farmers

Results Table 1 reveal the respondents were middle-aged to older farmers, with most (71.1%) aged between 41 – 60 years ($\bar{x}$= 51.80±9.11). Kansiime et al. (2019) observed that older farmers usually manifest less preference for mobile phone-based advisory services due to low familiarity with emerging technology. This may eventually pose a barrier to helpline service access by farmers. Majority (75.6%) of respondents were male, indicating a dominance of male in farming activities. This echoes Ragasa et al. (2025) who similarly highlighted low agricultural participation of female across Africa**.** This suggests that access to agricultural helpline services may translate to more male access. Most of the farmers possessed a level of formal education, with secondary (37.8%) and tertiary (31.1%) education. This to a degree indicates a literate population of farmers, which is expected to enhance their understanding of helpline services. Education enhances the ability of farmers to process information, make informed decisions and adopt technologies (Shitaye *et al*., 2025), which therefore would reduce barriers to accessing helpline services.

Most (62.2%) of the respondents possessed a substantial farming experience of ($\bar{x}$= 12.58±4.03 years). However, farmers who are more experienced are often less receptive to adoption of new technologies (Chowdhury *et al*., 2025). They depend more on their accumulated knowledge which may negatively affect their perceived need for helpline services. All respondents (100%) owned mobile phones, with most (91.1%) able to send SMS messages, signaling high level of digital access and technological capacity. This is favourable to the use **of** mobile-based helpline services. Only 35.6% of respondents were members of f**a**rmers' association, whereas membership of farmers' association can enhance the sharing of agricultural information among farmers.

Awareness of services provided by the helpline centre

Results in Table 2 broadly reveal that a substantial proportion of respondents were aware (86.7%) that smallholder farmers can submit enquiries from any location and obtain responses without having to visit the helpline centre physically (84.4%). These findings imply that farmers recognise that the helpline service system offers easy access and convenience to information through the use of mobile phones. *This is particularly important in addressing the limitations (e.g. distance, limited extension personnel, and high operational costs) commonly associated with conventional extension services.* Shitaye *et al*. (2025) similarly reported that mobile-enabled advisory services enhance outreach to remote farmers and reduce the need for physical interaction with extension agents.

Regarding information and advisory functions of the helpline centre, awareness was equally high. For instance, there was also high awareness regarding the establishment of the centre to improve the productivity of farmers (84.4%), through provision of crop and livestock information services (77.8%), while also offering a wide range of information such as marketing and weather updates (75.6%). This suggests that the relevance and scope of services provided by the centre are more or less known to farmers. Providing farmers with diverse agricultural information help to strengthen their ability to adopt new practices as well as their adaptive capacity (Asnakew *et al*., *2026).* With this level of awareness farmers would be ready to connect with helpline services to meet their different farming needs.

Additionally, it was observed that 77.8% of the respondents were aware that communication with farmers can be done in local languages (e.g. Yoruba) by the helpline centre. Hence, language should not pose a barrier to farmers' patronage of the centre. This aligns with Hainzer *et al*. (2022), who opined that using local languages in the delivery of extension services does not only reduces communication barriers but also enhances understanding of messages. Majority (84.4%) of the farmers were aware that services are provided free of charge by the helpline centre, suggesting that cost is not likely to be a barrier to access of these services.

Table 1: Sample characteristics of smallholder farmers

Variables	Category	%	Mean
Age	≤ 40	8.9	51.80±9.11
	41 – 50	37.8	
	51 – 60	33.3	
	≥ 61	20.0	
Sex	Male	75.6	
	Female	24.4	
Education	No formal education	13.3	
	Primary	17.8	
	Secondary	37.8	
	Tertiary	31.1	
Farming type	Crop	22.2	
	Livestock	28.9	
	Both	48.9	
Farming experience	≤ 10	17.8	12.58±4.03
	11 – 15	62.2	
	16 – 20	20.0	
Phone ownership	No	0.0	
	Yes	100.0	
Ability to send SMS	No	8.9	
	Yes	91.1	
Membership of farmers' association	No	64.4	
	Yes	35.6	

Source: Field survey, 2025.

Table 2: Awareness of helpline centre services by smallholder farmers

Helpline services	Aware
Accessibility and reach	
Receipt of questions from farmers irrespective of farmers' location	86.7
The helpline provides answers/solutions without requiring one to visit the centre physically	84.4
Location of one helpline centre in Southwest Nigeria	75.6
Information and advisory services	
Services are provided to both crop and livestock farmers by the centre	77.8
A wide range of information (e.g. marketing, weather updates) is provided by the centre	75.6
The centre was established to assist famers improve their productivity.	84.4
Language and communication support	
The centre located in the Southwest can respond to farmers in the local language (Yoruba)	77.8
Cost of service	
Services are rendered free of charge to farmers by the centre	84.4

Source: Field survey, 2025

Channels of information about helpline services

There was generally less information across all channels regarding information provided by the helpline as indicated in Table 3. Given that all the mean score are less than 1, it infers that information about helpline services were rarely received by farmers through these channels. Relatively, farmers' associations ($\bar{x}$ = 0.90±0.60) and fellow farmers ($\bar{x}$ = 0.71±0.59) were somewhat prominent channels of information among the farmers. Farmer organizations are known to promote the sharing of information, decision-making, and technology adoption (Adjin, 2021). Also, Pathak and Patel (2022) identified fellow farmers as an important channel of agricultural information in farming communities. This suggests that the high awareness previously observed regarding the services provided by the helpline centre was acquired through little but effective interactions mainly through farmers' associations and fellow farmers (peer networks)**.**

Given that farmers' access to formal and digital information channels is low as seen in the table, their awareness about helpline services may be considered merely basic as opposed to possessing adequate knowledge of how, when, or why to effectively utilize the services. Consequently, despite the high awareness, the low flow of information through the available channels may constitute a barrier to smallholder farmers' access of the services offered by the helpline centre.

Table 3: Information channels for helpline services by smallholder farmers

Channels	Mean	SD
Institutional channels		
ADPs/extension agents	0.23	0.42
Farmers' association	0.90	0.60
Mass media channels		
Radio	0.38	0.57
Television	0.20	0.50
Print media (pamphlets, posters, newspapers)	0.64	0.60
Interpersonal channels		
Fellow farmers	0.71	0.59
Digital channels		
Internet	0.31	0.51

Source: Field survey, 2025.

Attitude towards helpline services

Findings in Table 5 show that smallholder farmers had favourable attitude (62.2%) towards helpline services. It implies that most of the smallholder farmers perceive helpline services to be important in the delivery of agricultural information. As seen Table 4, there was ample agreement that the helpline would facilitate timely dissemination of information (77.8%), complement poor extension services (73.3%), and serve as a valuable source of agricultural information and technology delivery mechanism/channel (57.8%). *This affirms that with limited contact between smallholder farmers and extension agents, ICT-based advisory platforms significantly enhance the timeliness, relevance, and accessibility of agricultural information.* Mukherjee *et al*. (2025) likewise found that access to agricultural technologies which can result in the improvement of farmers' livelihoods can be facilitated by ICT-based extension systems. Positive disposition about helpline services would not likely constitute a serious barrier to access.

Conversely, the farmers expressed notable concerns; three-quarters (75.6%) held the view that the government may not be able to sustain the helpline centre, just as more than half (55.6%) thought it may be problematic to access the helpline centre, and that adequate real-time information may not be provided (57.8%). These aspects determine how efficiently, reliably, and promptly helpline services respond to farmers' enquiries and challenges, thereby ensuring

that digital advisory services effectively address farmers' information needs and support their decision-making. Despite the overall favourable disposition towards helpline services, operational effectiveness and sustainability concerns could limit patronage of the services.

Barriers to accessing of helpline services

As depicted in Table 6, prominent barriers affecting farmers' access to helpline services were inconsistency in the operation of the centre ($\bar{x}$ = 1.93±0.25), inadequate knowledge about the services of the centre ($\bar{x}$ = 1.86±0.45), and inadequate sensitisation about the centre ($\bar{x}$ = 1.84±0.47). These suggest that key barriers limiting farmers' access of helpline services relate more with institutional and enlightenment, as opposed to technological issues. The inconsistency in the operation of the centre reinforces a previous finding in this study regarding farmers' doubt as to the ability to sustain the running of the helpline centre by government (Table 4, Statement 4), where 75.6% of the respondents agreed that the Federal Government would not be able to sustain the farmers' helpline centre. This can reduce the trust and willingness of farmers to depend on the services provided by the helpline centre. Whereas, the success of digital agricultural interventions is reliant on sustained delivery of services and adequate support to promote uptake **(**FAO, 2023).

Inadequate knowledge about the services of the helpline centre might have occurred due to inadequate sensitisation during the commencement or establishment of the centre. Accordingly, farmers understanding of the operation of the helpline centre and the potential benefits would be limited by inadequate knowledge.

Table 4: Attitude of smallholder farmers towards helpline services

Statements	SA	A	U	D	SD
Farmers' helpline centre will facilitate timely information dissemination to farmers	8.9	77.8	6.7	2.2	4.4
Farmers' helpline centre will not be of benefit to farmers	4.4	31.1	20.0	6.7	37.8
Farmers' helpline centre will not serve the interest of farmers	8.9	35.6	26.7	4.4	24.4
Federal Government will not be able to sustain farmers helpline centre in Southwest Nigeria	13.3	75.6	6.7	0.0	4.4
Farmers' helpline centre will complement poor extension service	2.2	73.3	15.6	0.0	8.9
The use of indigenous language in the Southwest (Yoruba) will make farmers helpline centre attractive to the farmers	4.4	62.2	13.3	0.0	0.0
Both crop and livestock farmers would benefit from farmers helpline centre	6.7	69.9	17.8	0.0	6.7
Farmers' helpline centre will be a veritable source of agricultural information and technology delivery mechanism/channel	4.4	57.8	26.7	0.0	11.1
Accessing farmers helpline centre will be a problem to farmers	15.6	55.6	20.0	0.0	8.9
Farmers' helpline centre is a positive development in the history of agriculture in Southwest Nigeria	4.4	66.7	22.2	0.0	6.7
Farmers' helpline will be a waste of time for farmers	6.7	46.7	11.1	4.4	31.1
Farmers' helpline will not enable farmers to receive adequate information in real time	6.7	57.8	6.7	0.0	28.9

Source: Field survey, 2025.

Table 5: Categorisation of smallholder farmers' attitude towards helpline services

Attitude category	Percentage	Mean	SD
Favourable (37 – 48)	62.2	37.87	3.79
Unfavourable (26 – 36)	37.8		

Source: Field survey, 2025.

Table 6: Barriers to smallholder farmers' access to helpline services

Barriers	Mean	SD
High cost of call credits/call units	1.00	0.68
Illiteracy /Low level of education of smallholder farmers	0.68	0.55
Insufficient sensitisation of smallholders on helpline services	1.84	0.47
Inadequate access to telephone by farmers	1.04	0.52
Inadequate access to electricity for charging phones	0.84	0.36
Lack of trust in the helpline service as an extension agency	0.91	0.59
Inadequate access to physical extension personnel	0.68	0.63
Inadequate knowledge of the services of the helpline centre	1.86	0.45
Inconsistency in the operation of the centre	1.93	0.25

Source: Field survey, 2025.

Conclusion and Recommendations

Smallholder farmers' utilization of helpline services in Oyo State, Nigeria is primarily limited by institutional and awareness/enlightenment barriers as opposed to technological issues. Inconsistency in the delivery of services, inadequate sensitisation, and poor knowledge were identified as the critical barriers affecting helpline services, which collectively reduced the trust and effective engagement of smallholder farmers with the helpline centre. The high awareness and favourable attitude of smallholder farmers towards helpline services did not engender optimal access due to limited contact via information channels**,** along with concerns about sustainability of the helpline centre. It is therefore recommended that consistent and reliable service delivery be prioritised by policy makers and relevant government agencies. Furthermore, trusted information channels such as farmers' associations and peer networks should be harnessed to facilitate continuous sensitisation efforts.

References

Adjin, K. C. (2021). *Farmer organizations, spatial effects, and farm household performances: Econometric evidence from Senegal*. Doctoral Dissertation, Christian-Albrechts-Universität zu Kiel. https://nbn-resolving.org/urn:nbn:de:gbv:8:3-2021-00491-6

Ajambo, S., Kikulwe, E., Birachi, E. and Ogutu, S. (2024). How inclusive are smallholder farmers' access to digital agricultural platforms? Lessons from the EzyAgric digital platform in Uganda. *AfricArxiv (Preprint).* https://doi.org/10.60763/africarxiv /1694

Asnakew, F. T., Gebresenbet, G. and Kassie, K. E. (2026). Digital technologies in agricultural knowledge management and innovation systems at the rural household level in Northern Ethiopia. *Discover Food, 6*, Article 193. https://doi.org/10.1007/s44187-026-00907-y

Bashir, M. B., Adam, A. G., Abubakar, J. A., Faruk, A. U., Garuba, H. S. and Francis, N. B. (2021). The role of National Farmers Help Line in agricultural information dissemination among crop farmers in Nigeria: A case study of Farmers Help Line Centre, NAERLS ABU Zaria. *Journal*

of Agricultural Extension, 25(1), 93–103. https://doi.org/10.4314/jae.v25i1.8s

Chowdhury, J. A. S., Khalek, M. A. and Kamruzzaman, M. (2025). Farmers' climate change perception, impacts and adaptation strategies in response to drought in the northwest area of Bangladesh. *Climate Services, 38*, Article 100540.

Ding, J., Jia, X., Zhang, W. and Klerkx, L. (2022). The effects of combined digital and human advisory services on reducing nitrogen fertilizer use: Lessons from China's national research programs on low carbon agriculture. *International Journal of Agricultural Sustainability, 20*(6), 1136–1149. https://doi.org/10.1080/14735903.2022.2057643

Food and Agriculture Organization of the United Nations. (2023). *Strengthening digital agricultural extension and advisory services in smallholder farming*. https://doi.org/10.4060/cc6267en

Gega, M., Höhler, J., Bijman, J. and Oude Lansink, A. G. J. M. (2024). The relationship of firm ownership structure and sustainability performance in agri-food chains: A systematic literature review. *Cleaner Logistics and Supply Chain, 13*, Article 100193. https://doi.org/10.1016/j.clscn.2024.100193

Hainzer, K., O'Mullan, C. and Brown, P. H. (2022). The use of local knowledge in agricultural extension: A systematic review of the literature. *Journal of Agricultural Extension and Rural Development, 14*(1), 1–12. https://doi.org/10.5897/JAERD2021.1295

Kansiime, M. K., Alawy, A., Allen, C., Subharwal, M., Jadhav, A. and Parr, M. (2019). Effectiveness of mobile agri-advisory service extension model: Evidence from Direct2Farm program in India. *World Development Perspectives, 13*, 25–33.

Mukherjee, S., Padaria, R. N., Burman, R. R., Velayudhan, P. K., Mahra, G. S., Aditya, K., Bhat, A. G., Sarkar, S., Wason, M., Kumar, A., Chander, S. and Meena, M. S. (2025). Global trends in ICT-based extension and advisory services in agriculture: A bibliometric analysis. *Frontiers in Sustainable Food Systems, 9*, Article 1430336. https://doi.org/10.3389/fsufs.2025.1430336

National Agricultural Extension and Research Liaison Services. (n.d.). *National Farmers Helpline (NFHL).* https://naerls.gov.ng/nfhl/

Naveed, M. A. and Hassan, A. (2021). Sustaining agriculture with information: An assessment of rural citrus farmers' information behaviour. *Information Development, 37*(3), 455–467. https://doi.org/10.1177/0266666920932994

Ojo, I. E., Akangbe, J. A., Kolawole, E. A., Owolabi, A. O., Obaniyi, K. S., Ayeni, M. D., Adeniyi, V. A. and Awe, T. E. (2024). Constraints limiting the effectiveness of extension agents in disseminating climate-smart agricultural practices among rice farmers in north-central Nigeria. *Frontiers in Climate, 6*, Article 1297225. https://doi.org/10.3389/fclim.2024.1297225

Pathak, S. J. and Patel, M. B. (2022). Farmers perception about print media in agricultural information dissemination: A review. *Bhartiya Krishi Anusandhan Patrika, 37*(4), 339–342.

Ragasa, C., Tenneti, S., Bomuhangi, A., Mulwa, C., Najjar, D., Pazos, M., Polar, V., Teeken, B. and Yila, J. (2025). *Research priorities: Strengthening gender intentionality and accelerating broad, equitable impacts of genetic innovations*. CGIAR Gender Equality and Inclusion.

Shitaye, Z., Tadesse, B. and Enkuahone, K. (2025). Assessing the impact of agricultural information utilisation on wheat productivity of smallholder farmers: Evidence from northwest Ethiopia. *The Scientific World Journal, 2025*, Article 7605699. https://doi.org/10.1155/tswj/7605699

Yuan, Y. and Sun, Y. (2024). Practices, challenges, and future of digital transformation in smallholder agriculture: Insights from a literature review. *Agriculture, 14*(12), Article 2193. https://doi.org/10.3390/agriculture14122193