Improved Mass Media Accessibility as a Tool for Enhancing Farmers' Productivity and Livelihood in Delta State, Nigeria

*Belonwu, N. E[1]., [1]Ugboh, O., and [1]Chisonum, M
[1]Department of Agric. Economics and Extension, Faculty of Agriculture, University of Delta, P.O. Box 2020, Agbor, Delta State. Nigeria
Corresponding Author Email: eunice.belonwu@unidel.edu.ng, Phone no: 08126876683, 08033666969**.** https://orcid.org/0000-0002-1950-5020

Abstract
This study evaluated mass media accessibility as a tool for enhancing farmers' productivity and livelihood activities in Delta State, Nigeria. The research analyzed the effectiveness of mass media, farmers' perceptions, access levels, and factors influencing agricultural information access through these platforms. A multistage sampling method selected 268 farmers from four Local Government Areas across Delta North and South agricultural zones. Data were collected through structured questionnaires and analyzed using descriptive and inferential statistical methods, including binomial tests and chi-square analysis. Results revealed that 42.54% of farmers found mass media moderately effective in delivering agricultural information, while 45.90% had positive perceptions of its role. A majority (52.99%) reported high access to mass media platforms. Key factors significantly influencing access included farmers' income levels (78.73%) and educational background (71.64%). The study identified critical strategies for enhanced media usage, including reliable electricity supply (97.39%) and improved rural infrastructure (95.15%). Statistical analysis showed that 85.07% of farmers had strong perceptions of mass media usefulness in receiving agricultural information, with 80.97% experiencing livelihood improvements due to information access. The binomial test confirmed significant differences between farmers with high versus low perceptions of mass media's role ($p<0.001$). Chi-square analysis demonstrated significant improvements in livelihood activities after gaining mass media access ($p<0.001$). The study recommends government prioritization of electricity supply and rural infrastructure development to support effective mass media utilization in agricultural development, ultimately enhancing productivity and rural livelihoods in similar agro-ecological zones.
Keywords: *Mass Media* [1]*, Livelihood Activities* [5]*, Farmer's Accessibility* [2]*, productivity* [3]*, Information* [4]

Introduction

Agriculture remains the cornerstone of numerous developing nations' economies, particularly across Africa, where it sustains rural communities and makes significant contributions to national economic growth. Within Nigeria's context, the agricultural sector employs approximately 70% of the workforce and represents roughly 22-25% of the Gross Domestic Product (GDP), underscoring its vital importance for food security and poverty reduction efforts (FAO, 2022). Nevertheless, despite its significance, the sector continues to operate primarily at subsistence levels, with minimal value-added activities or processing capabilities, which limits its capacity for broader economic transformation (Nze *et al.,* 2021).

According to Encyclopedia.com (2020), mass media is defined as instruments for transmitting information, concepts, and ideas to both general and specialized audiences. It represents communication methods that reach large populations within short timeframes. Kris (2018) characterizes mass media as technologies employed as channels enabling small groups to communicate with larger populations. These constitute the delivery mechanisms of mass communication, which can be understood as the widespread, rapid, and continuous dissemination of messages to large and diverse audiences with the intention of influencing them.

Mass media plays crucial roles in agricultural development and significantly influences public opinion on various topics. The manner and scope of mass media utilization in mobilizing populations for agricultural purposes determines agricultural success levels. Agricultural program planners in developing nations recognize that agricultural technology development can be accelerated through effective mass media implementation.

The transition from subsistence-based to commercially-oriented farming requires access to timely, dependable, and readily available agricultural information. Mass media has emerged as a crucial instrument for bridging the information divide that exists between policymakers, agricultural specialists, and farming communities. When information is both precise and contextually relevant, it strengthens decision-making processes, encourages innovation, and boosts productivity levels (Malekani & Mubofu, 2020). Within agricultural contexts, essential information encompasses knowledge regarding market trends, technological innovations, weather patterns, and strategies for managing pests and diseases (Obiora *et al.,* 2021). As Belonwu *et al.* (2022) emphasize, modern agriculture increasingly depends on information access, making such knowledge essential for sustainable agricultural development. Conventional media platforms including radio broadcasts, television programming, and print newspapers continue to maintain important functions in rural regions where digital connectivity remains limited. However, digital technologies have created new possibilities for interactive, real-time communication through platforms such as Facebook, WhatsApp, YouTube, and Twitter, facilitating peer-to-peer knowledge exchange and improved market connections (Shaikh *et al.,* 2020; Uddin & Karim, 2023). The convergence of information and communication technologies (ICTs) with mass media has revolutionized agricultural communication systems. Mobile applications and digital platforms now provide localized, real-

time agricultural information, making knowledge resources more accessible and practically applicable (Luqman et al., 2019; Ankita *et al.,* 2023).

Despite technological advances, numerous obstacles limit mass media accessibility throughout Nigeria. These challenges encompass inadequate electricity infrastructure, low-income levels among rural populations, widespread illiteracy, poor rural connectivity, insufficient locally-relevant content, and elevated operational expenses (Akshaya & Vijayakumar, 2017; Akioya & Ikoyo-Eweto, 2018; Atiso *et al*., 2021). Such constraints diminish farmers' capacity to fully utilize available agricultural information resources.

Research demonstrates that enhanced media accessibility facilitates knowledge distribution, empowers farming communities, and supports more informed agricultural decision-making processes (Nwalieji *et al*., 2019; Javaid, 2017). Enhanced mass media accessibility improves information distribution, reduces extension service costs, and provides farmers with timely knowledge that enhances productivity outcomes. Extension organizations also rely on media platforms to rapidly distribute innovations to broad audiences (Okwu & Daudu, 2011; Anyanwu & Udoh, 2022). In Nigeria's context, utilizing multiple media channels aligns with national agricultural policies designed to inform farmers about innovations, emergency situations, and market opportunities.

Furthermore, mass media serves as an advocacy platform, increasing awareness about issues such as climate change impacts, rural poverty conditions, and resource management strategies, while promoting sustainable agricultural practices including biodiversity preservation, soil health maintenance, and water resource management (Ebisike *et al.,* 2021).

The literature collectively demonstrates that mass media functions as an effective channel for reinforcing existing knowledge, introducing new technologies, and enhancing farmers' decision-making capabilities. While traditional media platforms remain essential, ICT integration has broadened the scope and immediacy of agricultural communication systems. Addressing systemic challenges including inadequate rural infrastructure, unreliable electricity supply, and limited digital literacy remains critical. When these issues are resolved, improved media accessibility can substantially enhance farmers' productivity, strengthen rural livelihoods, and advance food security and sustainable agricultural development throughout Delta State and Nigeria as a whole. Against

this background this study explores mass media contributions of enhancing farmers' livelihood activities. Its objectives are to:

- To evaluate the effectiveness of mass media in communicating agricultural information,
- To identify the factors that influence farmers' access to such information,
- To understand farmers' perceptions of mass media as an agricultural information source,
- To examine how access to media impacts farmers' livelihood improvements,
- To propose strategies to strengthen the use of mass media in agriculture.

Research Hypotheses

Ho1: There is no significant difference in the proportion of farmers with a high perception of the accessibility of mass media in delivering agricultural information.

Ho2: There is no significant relationship between mass media accessibility and the improvement of farmers' livelihoods in agricultural production.

Materials and Methods

The research was conducted in Delta State, located in Nigeria, Delta comprises 25 local government areas (LGAs) and has its capital in Asaba. Covering 17,698 km², the state has a projection population of 5,636,100 as of 2022 (Delta State Population Statistics, chart, map, accessed 4th of July 2025). It is rich in oil and has fertile land suitable for diverse agricultural activities. Ethnic groups in the state include the Isoko, Ika, Urhobo, Itshekiri, Izon, Ukwuani, and Aniocha. The state experiences both dry and rainy seasons, with an average temperature of 28.64°C and average annual rainfall of 241.52 mm (Adejuwon, 2018).

Data Collection

Primary data were collected through questionnaires and interviews administered to both literate and illiterate farmers. Secondary data were sourced from textbooks, academic journals, and online databases. The questionnaire was validated using the jury method, involving expert reviews to ensure alignment with the study's objectives and hypotheses.

Sampling Technique

A multi-stage random sampling technique was adopted: Stage 1: Two of the three agricultural zones in the state (Delta North and Delta South) were selected. Stage 2: Two LGAs were chosen from each zone Ndokwa West and Aniocha North (Delta North), and Ethiope East and Ughelli

North (Delta South). Stage 3: Two communities from each LGA were randomly selected, totaling eight: Ogume and Utagbe- Unor (Ndokwa West), Ezi and Issele Uku (Aniocha North), Abraka and Isiokolo (Ethiope East), and Ughelli and Agbarha (Ughelli North). Stage 4: From each community, 35 farmers were randomly selected, resulting in 280 participants. Out of these, 268 (95.71%) returned properly completed questionnaires used for analysis.

Data Analysis

Descriptive statistics (percentages, means, standard deviations) were used to evaluate objectives such as the effectiveness of mass media, farmers' perceptions, and the contribution of media access to increased agricultural productivity and livelihood improvements. A 4-point Likert scale assessed factors influencing access to information, ranked from major to insignificant. Any factor or strategy with 50% or more of responses in the higher categories was considered significant.

Inferential statistics, including the binomial test, were used to determine if a statistically significant proportion of farmers with a high perception of the accessibility of mass media in delivering agricultural information. The formula for binomial distribution is given as follows:

$$P_{(x:\, n,\, p)} = {}^{n}C_{X}P^{X}(1-p)^{n-x} \text{---------- Eq. 1}$$

Where:

b = binomial probability

x = total number of successes (farmers who have high perception and those with low perception on the role of mass media as source of receiving agricultural information)

p = probability of success on an individual trial

n = number of trials (occurrences)

${}^{n}C_{x}$ is the combination of n and x. A combination is the number of ways to choose a sample of x elements from a set of n distinct objects where order does not matter, and replacements are not allowed.

Chi-square:

Chi-square was employed to test the difference between mass media accessibility and the improvement of farmers' livelihoods in agricultural production. The model is mathematically expressed as:

$$X\, C^{2} = E_{i}\, (O_{i}\, E_{i})\, 2/\, E_{i.} \text{---------- Eq. 2}$$

Where:

X^2 chi-square calculated

O observed frequency

E Expected frequency.

To obtain E: row total X column total/N

For the degree of freedom (df), (R-1) (C-1)

Where r is row and c is column.

Chi-square was used to test the hypothesis that states that Ho. Mass media accessibility does not significantly contribute to improved livelihood of farmers

Results and Discussion

Table 1: Impact of mass media on disseminating agricultural information to farmers

Effect of mass media	Frequency	Percentage
Very effective	51	19.03
Just effective	114	42.54
Averagely effective	69	25.75
Fairly effective	23	8.58
Not effective	11	4.10

Source: Field survey, 2024

Impact of Mass Media on the Dissemination of Agricultural Information to Farmers

The effectiveness of mass media use by farmers refers to the degree to which they have significantly benefited from it, particularly in accessing agricultural technologies. Table 1 presents findings on the influence of mass media in distributing agricultural information to farmers. The results show that a large portion of the respondents 42.54% considered mass media to be moderately effective in delivering agricultural information. Additionally, 19.03% rated it as very effective, while 25.75% found it to be somewhat effective. These findings suggest that most farmers are utilizing mass media effectively as a key source of agricultural information. This is likely contributing to the accelerated adoption of agricultural innovations. The result aligns with the study by Olatinwo *et al*. (2023), which reported a high level of effective mass media use among women farmers in Kwara State, Nigeria, leading to notable improvements in their agricultural productivity.

Table 2: Factors determining farmer's accessibility to agricultural information through mass media

Factors determining mass media accessibility	Insignificant	Minor	Moderate	Major	Remark
Income level of farmers	1.12	3.73	16.42	78.73	Agreed
Level of education	3.36	5.22	19.78	71.64	Agreed
Availability electricity	2.99	8.96	20.52	67.54	Agreed
Language barriers	9.33	17.91	10.82	61.94	Agreed
Cultural factors of the farmers	10.82	16.79	11.57	60.82	Agreed
Service collaboration	14.18	6.72	18.28	60.82	Agreed
Access to ICT tools	12.31	15.30	16.04	56.34	Agreed
Cost of mass media tools	9.33	15.30	21.64	53.73	Agreed
Confidence of farmers on mass media source	22.01	35.45	31.34	11.19	Disagreed
Government policy	25.75	85	32.46	10.07	Disagreed

Source: Field survey, 2024

Factors Influencing Farmers' Access to Agricultural Information via Mass Media Descriptive Statistical Analysis using a Weighted Mean Score or Rating Scale Analysis

Table 2 outlines the key factors affecting farmers' access to agricultural information through mass media. The most significant factors identified were: farmers' income levels (78.73%), educational attainment (71.64%), availability of electricity (67.54%), and language barriers (61.94%). Additional influential factors included cultural influences (60.82%), collaboration with agricultural extension services (60.82%), access to ICT tools (56.34%), and the cost of mass media tools (53.73%). The findings indicate that farmers' ability to access agricultural information through mass media is shaped by a combination of socioeconomic and infrastructural elements. Addressing these factors comprehensively is essential for enhancing access and ensuring effective use of media-based agricultural information. These results are consistent with the studies of Muhammad *et al.* (2019) and Lawal *et al*. (2017), who identified similar determinants. Both studies emphasized that improving access to affordable and relevant agricultural information through mass media is critical for driving progress within the agricultural sector.

Table 3: Farmers perception on the role of mass media as source of agricultural information

Perception level	Frequency	Percentage
Very high	65	24.25
High	123	45.90
Moderate	69	25.75
Low	11	4.10

Source: Field Survey, 2024

Farmers' Perception of Mass Media as a Source of Agricultural Information

Table 3 presents data on how farmers perceive the role of mass media in delivering agricultural information. The results show that a significant portion of the respondents (45.90%) had a high perception of mass media's role in disseminating agricultural knowledge. Additionally, about 24% of the farmers reported a very high perception, while approximately 26% expressed a moderate level of perception.

Mass media, due to its broad reach and ability to communicate simultaneously to large and dispersed audiences, can play a critical role in agricultural extension—particularly in areas where there is a shortage of extension personnel relative to the farming population. These findings are consistent with the work of Ani *et al*. (2017), who highlighted the various functions of mass media, including facilitating links between farmers, researchers, and extension agents, spreading agricultural innovations, and offering training to farmers.

Table 4: Extent to which farmer's access to mass media has improved their livelihood activities

Extent of farmers access	Frequency	Percentage
Very high	61	22.76
High	142	52.99
Moderate	56	20.90
Low	9	3.36

Source: Field survey, 2024

Extent to Which Farmers' Access to Mass Media Has Enhanced Their Livelihood Activities

Table 4 presents data on the impact of farmers' access to mass media on their livelihood activities. The findings show that a majority of the respondents 52.99% reported that mass media access has significantly improved their livelihood. Additionally, about 23% indicated a very high level of improvement, while 21% noted a moderate improvement.

The implies that mass media plays a critical role in enhancing knowledge transfer, productivity, and decision-making in farming households, yet limited access may hinder inclusive development, notably in enhancing their productivity and creating new livelihood opportunities. These results support the findings of Anyanwu and Udoh (2022), who concluded that access to timely and relevant agricultural information through mass media enables farmers to make informed decisions, thereby boosting their livelihood outcomes.

Table 5: Strategies to improve mass media use for agricultural information

Strategies to improve mass media use for agricultural information	Not significant	Minor	Moderate	Major	Remark
Government agencies should ensure consistent electricity in rural areas.	- 0.00	- 0.00	2.61	97.39	Agreed
Sufficient rural infrastructure and facilities	- 0.00	- 0.00	4.85	95.15	Agreed
Sufficient rural infrastructure and facilities	1.87	5.97	12.69	79.48	Agreed
Improved farmer education by extension services	4.10	5.97	11.19	78.73	Agreed
Prioritize farmers' needs, interests, and timing of information delivery	6.72	15.30	10.07	67.91	Agreed
Mass media should share agricultural info in local languages.	1.49	13.81	22.76	61.94	Agreed
Extension agencies should promote mass media use for agricultural info.	11.94	15.30	16.04	56.72	Agreed
Use of diverse media to reach farmers	7.84	18.28	17.54	56.34	Agreed
Interactive media programs should be effectively developed and utilized.	19.40	12.31	15.67	52.61	Agreed
Improve rural education to boost farmer attendance.	16.04	14.18	18.28	51.49	Agreed
Train farmers in farming practices via mass media.	25.00	33.96	26.87	14.18	Disagreed
Train farmers in farming practices via mass media.	29.48	35.07	23.13	12.31	Disagreed

Source: Field survey, 2024, Agreed ≥ 50%

Strategies to Enhance the Use of Mass Media as a Source of Agricultural Information

Descriptive Statistical Analysis with Weighted Mean

Table 5 outlines several strategies suggested by farmers to improve the use of mass media in accessing agricultural information. The most highly supported strategies include ensuring a stable power supply 97.39% and providing adequate rural infrastructure and facilities 95.15%. Other key strategies include increasing the involvement of extension agents in using mass media for information dissemination 79.48%, raising the education level of rural farmers through extension services 78.73%, and prioritizing farmers' needs, interests, and preferred timing for agricultural programs 67.91%. These strategies ranked first through fifth, respectively.

Additional strategies that received substantial support include broadcasting agricultural information in local languages and dialects 61.94%, raising awareness of mass media use through extension agencies 56.72%, using a variety of media tools and channels 56.34%, developing interactive media programs 52.61%, and expanding rural educational opportunities 51.49%. These were ranked sixth to tenth.

It is important to note that these strategies can be applied individually or in combination to boost farmers' effective use of mass media for agricultural information. Obiora *et al.* (2023) emphasized the importance of adult education, aligning media content with farmers' current needs, and ensuring programs reflect their interests. Similarly, Mgbakor *et al.* (2013) highlighted the importance of increasing awareness, involving extension agents, and improving educational levels

in rural communities. Olatinwo *et al*. (2023) also recommended making mass media tools more affordable and diversifying communication channels as key measures for enhancing farmers' access to agricultural information through mass media.

Table 6: There is no significant difference in the proportion of farmers with a high perception of the accessibility of mass media in delivering agricultural information.

Proportion of farmers access to mass media	Frequency	Proportion	Prob. Level
Proportion of farmers with high perception	228	85.07 (0.857)	0.001
Proportion of farmers with low perception	40	14.93 (0.143)	

Source: Field survey, 2023

Proportion of farmers with a high perception of the accessibility of mass media in delivering agricultural information (Binomial test)

Table 6 presents the analysis of farmers' perception regarding mass media as a source of agricultural information, using the Binomial test. The results showed that a significant majority (85.07%) of the farmers had a high perception of the accessibility mass media, while only 14.93% had a low perception. The statistical test was significant at the 1% probability level, leading to the acceptance of the alternative hypothesis—that the proportion of farmers with high perception significantly differs from those with low perception.

This notable difference suggests that a larger number of farmers recognize and value the benefits of mass media in accessing agricultural information. Such benefits may include improved access to extension services, agricultural inputs, and increased productivity. These findings align with those of Ani et al. (2017), who reported that mass media serves multiple functions in agricultural development, contributing positively to farmers' awareness and perception of its usefulness.

Table 7: Difference in mass media accessibility and the improvement of farmers' livelihoods in agricultural production. (Chi-Square Test)

Rural farmers livelihood activities	Frequency	Percentage	Prob. Level
High livelihood activities (status of livelihood activities after having access to mass media)	217	80.97	0.001
Low livelihood activities (status of livelihood activities before having	51	19.03	

access to mass media)

Source: Field survey, 2024

Difference in mass media accessibility and the improvement of farmers' livelihoods in agricultural production. (Chi-Square Test)

A chi-square test was conducted to determine whether there was a significant difference in mass media accessibility and the improvement of farmers' livelihoods in agricultural production. The results revealed a statistically significant difference ($p = 0.001$), indicating that the farmers' livelihood activities improved significantly after accessing mass media, leading to the acceptance of the alternative hypothesis—that there is a notable change in farmers' livelihood activities towards their exposure to mass media.

Before gaining access to mass media, only 19.03% of farmers reported low livelihood activity. In contrast, after gaining access, 80.97% reported high livelihood activity. This substantial increase suggests that mass media played a critical role in enhancing farmers' engagement in productive livelihood activities. This outcome suggests that access to mass media enhances farmers' opportunities to obtain agricultural inputs, information, and resources, thereby improving production, boosting income-generating ventures, encouraging diversification, and enabling engagement in off-farm businesses. These findings are consistent with Pandey (2017), who affirmed that access to information through mass media is a fundamental factor in improving agricultural productivity and expanding farmers' livelihood opportunities.

Conclusion and Recommendations

This study has provided a comprehensive assessment of the extent to which access to mass media contributes to improved productivity and livelihood activities among farmers in Delta State, Nigeria and concluded that farmers' access to mass media is high, and this has been effective in disseminating agricultural information. It was also found that several factors, such as the farmers' income level, education, availability of electricity, and language barriers, influence their access to agricultural information through mass media. Furthermore, farmers have generally high perception of the role of mass media in providing agricultural information.

The study highlighted several strategies to improve the use of mass media by farmers. These include ensuring regular power supply, providing adequate rural infrastructure and facilities, increasing the presence of extension agents to boost mass media usage for agricultural information, enhancing farmers' education, and ensuring the timely delivery of agricultural content. The

research also revealed that there is a significant difference in the perception of farmers with high versus low perceptions of mass media's role in agricultural information dissemination. Additionally, the study found a noticeable improvement in the livelihood activities of rural farmers after they gained access to mass media.

Based on these findings, the study recommends the following:

- The government at all levels should focus on improving power supply in rural areas, as this would encourage farmers to adopt and utilize mass media tools.
- There should be sufficient investment in rural infrastructure, including roads, schools, and mass media network services. These improvements will increase farmers' interest in using mass media for agricultural information.
- The establishment of educational centers offering adult education services is necessary. These centers would address the educational needs of older individuals in rural areas and enhance their engagement with mass media for agricultural information.

Competing Interests

Author have declared that no competing interests exist

References

Adejuwon, J. O. (2018). Effect of seasons on spatial variability of rainfall in the Niger Delta, Nigeria. *Journal of Applied Sciences and Environmental Management, 22*(10), 1701–1706.

Akioya, A. O., & Ikoyo-Eweto, G. O. (2018). Analysis of mass media use and preferences in information sourcing among farming households in Edo State, Nigeria. *IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS), 11*(7), 9–15. https://www.iosrjournals.org

Akshaya, K. K. S., & Vijayakumar, K. P. (2017). Role of mass media in disseminating agricultural information to farmers of Nedumangad block in Kerala. *International Journal of Information Movement, 2*(8), 44–51. http://ijim.in

Ani, A. O., Umunakwe, P. C., Ejiogu-Okereke, E. N., Nwakwasi, R. N., & Aja, A. O. (2017). Utilization of mass media among farmers in Ikwere Local Government Area of Rivers State, Nigeria. *International Journal of Agricultural Extension and Rural Development Studies, 5*(2), 35–44.

Ankita, Verma, V., & Rani, E. (2023). Role of social media in extension: A review. *International Journal of Humanities, Social Science and Management (IJHSSM), 3*(3), 7–17. http://www.ijhssm.org

Anyanwu, B., & Udoh, G. N. (2022). The effectiveness of mass media in agricultural extension and development. *African Journal of Agricultural Science and Food Research, 3*(1), 25–36.

Belonwu, N. E., Umeri, C., Moseri, H., & Onikor, J. (2022). Availability, accessibility, and utilization of information and communication technology (ICT) among extension workers in Ika South Local Government Area of Delta State. *University of Delta Journal of Contemporary Studies in Education (UDJCSE), 2,* 58–69.

Delta State population statistics, charts, maps and location. (2023, June 28). *City Population.* https://citypopulation.de/admin

Ebisike, C., Fadiji, T. O., & Sennuga, S. O. (2021). Awareness and usage of information and communication technologies (ICTs) among farmers in Federal Capital Territory, Nigeria. *Current Trends in Agriculture, Environment and Sustainability, 2*(1), 1–4.

Food and Agriculture Organization of the United Nations (FAO), & International Telecommunication Union (ITU). (2022). *Status of digital agriculture in 47 sub-Saharan African countries.* Rome: FAO. https://doi.org/10.4060/cb7943en

Food and Agriculture Organization of the United Nations (FAO), & World Food Programme (WFP). (2022). *Special report – FAO/WFP crop and food security assessment mission (CFSAM) to the Democratic Socialist Republic of Sri Lanka, September 2022.* Rome: FAO. https://doi.org/10.4060/cc1886en

Javaid, U. (2017). Role of mass media in promoting agricultural information among farmers of district Nankana. *Pakistan Journal of Agricultural Sciences, 54*(3), 711–715. https://doi.org/10.21162/PAKJAS/17.5751

Kris, H. K. (2018). *Understanding mass media communication.* Communication Thought Co. Press.

Lawal, A. F., Alabi, A. A., & Oladele, A. O. (2017). Elements of rural economics: Access to agricultural information among rural women farmers in Abuja, Nigeria. *The Journal of Agricultural Sciences, 12*(2), 63–75.

Luqman, M., Yaseen, M., Ashraf, S., Mehmood, M. U., & Karim, M. (2019). Factors influencing use of information and communication technologies among farmers in rural Punjab, Pakistan. *Journal of Agricultural Extension, 23*(2), 101–112.

Malekani, A., & Mubofu, C. (2020). Agricultural information sources, channels and strategies for sharing agricultural research findings among farmers in Iringa District in Tanzania. *Library Philosophy and Practice (e-journal),* 4104. https://digitalcommons.unl.edu/libphilprac/4104

Mgbakor, M., Iyobor, O., & Okezie, U. M. (2013). Contributions of mass media to the development of agricultural extension in Ika North East L.G.A. of Delta State, Nigeria. *Academic Journal of Plant Sciences, 6*(3), 127–133. https://doi.org/10.5829/idosi.ajps.2013.6.3.1113

Mohammed, U., Umar, I. S., Olaleye, R. S., Salihu, I. T., Tsado, J. H., & Pelemo, J. J. (2019). Effects of forest resources utilisation on the livelihood of the rural farming populace in Kogi and Niger States, Nigeria. *Journal of Agriculture and Environment, 15*(1), 77–88.

Msuya, C. P., & Annor-Frempong, F. K. (2017). The role of agricultural extension in Africa's development: The importance of extension workers and the need for change. *International Journal of Agricultural Extension, 5*(1), 59–70.

Muhammad, L., Muhammad, Y., Saleem, A., Muhammad, U. M., & Mujahid, K. (2019). Factors influencing use of information and communication technologies among farmers in rural Punjab, Pakistan. *Journal of Agricultural Extension, 23*(2), 101–112.

Nwalieji, H. U., Ezeakunne, C. C., Enwelu, I. A., Okeke, M. N., Udemezue, J. C., & Uzuegbunam, C. O. (2019). Mass media utilization by poultry farmers in Anambra State, Nigeria. *Journal of Agricultural Extension, 23*(2), 1–12. https://doi.org/10.4314/jae.v23i2.1

Nze, E. O., Onwukwe, F. O., & Ama, R. A. (2021). Poverty and coping strategies among value-added cassava entrepreneurs in Imo State, Nigeria. *Nigerian Agricultural Journal, 52*(1), 255–262.

Obiora, C. C., Uzoka, I. O., Momah, L. N., & Olaroye, E. R. (2021). Utilization of mass media as a source of agricultural information among farmers. *Unizik Journal of Educational Research and Policy Studies, 16*(2), 211–218.

Okwu, O. J., & Daudu, S. (2011). Extension communication channels' usage and preference by farmers in Benue State, Nigeria. *Journal of Agricultural Extension and Rural Development, 3*(5), 88–94.

Olatinwo, L. K., Abdulrahman, M. T., & Komolafe, S. E. (2023). Women farmers' perceived effectiveness of mass media in accessing agricultural information in Kwara State, Nigeria. *Journal of Agriculture and Environment, 19*(1), 109–116.

Pandey, N. (2017). Role of information and communication technology in agriculture development: A study of Nabarangpur District. *Scholedge International Journal of Business Policy & Governance, 4*(4), 24–35.

Shaikh, S. S., Hassan, A., & Forooqui, Y. S. (2020). Role of mass media in dissemination of agricultural information among farmers of Hyderabad (Sindh), Pakistan. *Global Economics Review, 5*(3), 88–96. https://doi.org/10.31703/ger.2020(V-III).09

Uddin, F., & Karim, A. (2023). Perceptions of the role of social media in agricultural information among Bangladeshi farmers. *Journal of Agricultural Extension and Rural Development, 9*(1), 28–36.