Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
Special Issue on Global Research Trends in
Multidisciplinary and Interdisciplinary Studies 7(11s)

FARM INFORMATION NEED ASSESSMENT THROUGH DIGITAL MEANS

Kamaleswaran K. [1], Rajasekaran R. [2], M. Sathaiah [3], T. Ragunathan [4]

[1] Research Scholar, PG, Department of Agricultural Extension and Communication, SRM College of Agricultural Sciences, SRM Institute of Science and Technology, Baburayanpettai, Chengalpattu, Tamil Nadu, India
[2] Assistant Professor (Agri), Department of Agricultural Extension and Communication, SRM College of Agricultural Sciences, SRM Institute of Science and Technology, Baburayanpettai, Chengalpattu, Tamil Nadu, India
[3] Assistant Professor (Agricultural Economics) Department of Agricultural Economics, SRM College of Agricultural Sciences, SRM Institute of Science and Technology, Baburayanpettai, Chengalpattu, Tamil Nadu, India
[4] Assistant Professor, Department of Basic Sciences, SRM College of Agricultural Sciences, SRM Institute of Science and Technology, Baburayanpettai, Chengalpattu, Tamil Nadu, India

Received 06 March 2026
Accepted 02 May 2026
Published 21 May 2026

Corresponding Author
Rajasekaran R.,
rajasekr1@srmist.edu.in

DOI
10.29121/shodhkosh.v7.i11s.2026.8228

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

The adoption rate of digital technologies in agriculture is increasing at an exponential pace. Therefore, this study aims to examine the information needs of farmers, the digital platforms they utilizing, their perceptions of the effectiveness of advisory services offered by these platforms, the challenges they fare while adopting such services, and their suggestions for improvement. A total number of 120 farmers were interviewed using a structured interview schedule and the data were analyzed using descriptive statistics and principal component analysis (PCA). The findings indicate that farmers have a greater need for information related to soil testing and fertility management, crop production practices and weed management. Factor analysis categorized these needs into five underlying dimensions climate and crop production information, market-oriented production information, institutional and financial support information, soil and input management information, and digital market information. The analysis of digital information sources revealed two dominant usage patterns: one associated with formal platforms, such as government portals, weather applications, mobile-based agricultural apps, and another associated with interactive platforms, including YouTube, social media page and webinars. This study underscores the importance of strengthening a localized, credible, and farmer-oriented digital extension system to enhance agricultural productivity and income.

Keywords: Digital Agricultural, Farmers Information Needs, Agricultural Information System, ICT, Enabled Extension, Rural Digitalization

1. INTRODUCTION

In today's agricultural situation getting the right information at the right time is very important for practicing agriculture in a sustainable and scientific manner. Farmers require regular and updated information from research institution and extension systems to improve their farming practices and increase profitability. Timely information on new technologies, improved practices and market conditions can significantly influence farm productivity and income.

Nowadays climate change at both regional and local levels is creating new challenges for farmers. As a result, farmers require location-specific and updated solutions to manage their crops effectively (Aranguri et al., 2025). In this changing environment, information and communication technology (ICT) plays a viral role the rapid and efficient dissemination of agricultural technologies. The use of mobile phones, internet services, and other digital tools to access agricultural information has become almost unavoidable in modern farming. Exposure to modern ICT tools is now considered an essential capability for farmer. Those who are able to use digital tools can easily access information from different agricultural sources (Abdulai et al., 2023). Therefore, assessing farmers information needs through digital media is highly very important. It helps us in understand the type of information they preferred mode of access it. The findings of this study are expected to contribute to both policy and practice by offering insights into design of farmer-centric digital extension systems. By identifying the key areas of information needed by farmers and the major challenges they face in accessing information, this study provides a clear basis for improving digital agricultural information services making them more relevant, inclusive, and useful. By keeping these in mind this study aims to assessed the major categories of farm information required by farmers, examine the use of digital information sources for accessing agricultural information, evaluate perceived effectiveness of digital agriculture information, identify the constraints faced by farmer in accessing and utilizing digital information, finally derive policy and extension implications for improving digital information delivery system.

2. MATERIALS AND METHODS

The study was conducted among the farmers in Chengalpattu district, Tamil Nadu to analysis farm information need through digital means. The district represents a typical agricultural region characterized by diverse cropping pattens, varying farm sizes, and increasing exposure to digital information sources. The area was selected to capture farmers operation under a mixed farming system where access to agricultural information plays an important role in production and market-related decision. The selection of the study area was guided by its relevance to the research objectives and the presence of active farming communities with varying levels of digital engagement.

The list of farmers was collected from the Assistant Director of Agriculture office covering Eight blocks in Chengalpattu district. From each block 15 farmers were randomly selected in sample of 120 farmers surveyed.

Table 1

Table 1 Block Wise Selection

S.No	Blocks	No of farmers surveyed
1	Acharapakkam	15
2	Chithamur	15
3	Kattankolathur	15
4	Lathur	15
5	Madurantakam	15
6	St. Thomas Mount	15
7	Thiruporur	15
8	Tirukkalukunram	15

Primary data were collected in December 2025 using a structured interview schedule designed specifically to the objective of the study. The schedule was pre-tested in a non-sample area and subsequently refined to improve clarity and relevance. Data collection focused on farmer's socio-economic characteristics, type of agriculture information required, the digital platforms used to access such information on. Responses related to information needs, effectiveness and constraints faced in accessing and utilizing digital platforms were measured using a Likert-type scale to capture the intensity of farmer's perceptions and experience. Personal interviews were conducted to ensure to clear understanding of the questions and to minimize non-response errors.

The research design followed a descriptive and analytical framework. Descriptive analysis was used to summarize the socio-economic profile of respondents and to examine patterns of information needs and digital information usage. Analytical techniques were employed to identify underlying structures and relationships among the variables related to farm information needs and digital information access. The combination of descriptive and analytical approaches enabled both characterization and deeper interpretation and analytical approaches enabled both characterization and deeper interpretation of the data.

To analyze the data, percentage analysis was used to examine the distribution of farmers across different categories of information needs and digital information usage. Mean score analysis was applied to assess the relative importance and perceived effectiveness of various information components and to rank constraints faced by farmers. To identify the latent dimension underlying multiple information-related variables, principal component analysis was employed. Factor analysis with varimax rotation was used to reduce the large number of variables and to group similar variables into meaningful components. Before applying factor analysis, the suitability of the data was checked using standard diagnostic measures, such as sampling adequacy and correlations among variables. All the statistical analyses were carried out using appropriate statistical software.

The analytical framework used in this study helped in systematically understanding farmer's information need, the role of by digital information sources, and the constraints affecting their use.

3. RESULT AND DISCUSSION

3.1. THE KINDS OF FARM RELATED INFORMATION THAT FARMERS NEED

Table 2

Table 2 Descriptive Statistics

Variables	Mean	Std. Deviation	Analysis N
Crop production practices	2.33	0.624	120
Seed/variety selection	1.91	0.674	120
Soil testing & fertility management	2.46	0.564	120
Pest & disease management	1.69	0.646	120
Weed management	2.23	0.742	120
Irrigation & water management	2.12	0.712	120
Farm mechanization	2.05	0.633	120
Post-harvest handling/storage	1.95	0.808	120
Market price information	1.98	0.692	120
Weather forecast	1.96	0.824	120
Government schemes & subsidies	1.88	0.815	120
Credit/loan facilities	1.78	0.739	120
Organic/natural farming practices	1.94	0.702	120
Input availability (seed, fertilizer, pesticide)	1.78	0.832	120
Digital platforms for selling produce	1.63	0.549	120

Farmer's information needs were analyzed using descriptive statistics and principal component analysis to identify the main priority areas of information and to understand the overall patterns of farmers information demand. Table 2 follows the Likert scale, where the minimum value is 1 and the maximum value is 5, for measuring the responses and further mean and standard deviation for the values were analyzed.

The table indicated that the significant differences were observed in farmer's information need. Among the needs list taken for the analysis, soil testing and fertility management related information were the highest needs of the farmers with the highest mean score (2.46) followed by the crop production practices were the second most priority of needs (2.33) as perceived by the respondents. During the respondent survey it was observed that majority of the farmers were particularly inserted in understanding fertility, of their own field and expressed willingness to undertake soil testing. Information related to Weed management, irrigation, water management and farm mechanization ranked the third, fourth and fifth respectively among the farmer's perceived needs in chengalpattu district. Even though the district is blessed with numerous of water catchment and storage structures such as lakes, ponds etc., the summer often brings drought condition and water scarcity of irrigation. This seasonal variability likely explains why irrigation and water management information appeared among the top priorities for farmers in the district.

Meanwhile information related digital platforms foe selling their own produce, credit and loan facilities and input availability received the lowest mean score, indicating that the least prioritized information need. The State Department of Agriculture is progressively providing credit support to the farming community, especially majority of the farmers were registered under the Pradhan Mantri Kisan Samman Nidi scheme and were already receiving financial benefits.

Further, the findings suggest that while farmers recognize the importance of production-related information, market-linked and institutional information is perceived as less immediately critical. This may be attributed to limited familiarity or confidence in digital mechanisms for marketing and accessing services finance.

Table 3

Table 3 KMO and Bartlett's Test of sampling adequacy for farming information variables

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.712
Bartlett's Test of Sphericity	Approx. Chi-Square	944.397
	Df	105
	Sig.	.000

Before proceeding with factor extraction, the suitability of the data for principal component analysis was assessed. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.712, exceeding the recommended threshold of 0.70 (Vishak; Ambedkar et al., 2025). Indicating an acceptable level of shared variance among variables. Bartlett's test of sphericity was statistically significant (x2=944.397; df=105; $p<0.001$), confirming that the correlation matrix was not an identity matrix and that the variable was sufficiently interrelated to justify factor analysis. These diagnostic results collectively confirm that appropriateness of applying PCA to the dataset.

Table 4

Table 4 Communalities of farming information variables (Extraction method: PCA)

Variables	Initial	Extraction
Crop production practices	1.000	0.805
Seed/variety selection	1.000	0.754
Soil testing & fertility management	1.000	0.699
Pest & disease management	1.000	0.744
Weed management	1.000	0.728
Irrigation & water management	1.000	0.627
Farm mechanization	1.000	0.772
Post-harvest handling/storage	1.000	0.763
Market price information	1.000	0.861
Weather forecast	1.000	0.863
Government schemes & subsidies	1.000	0.630
Credit/loan facilities	1.000	0.689
Organic/natural farming practices	1.000	0.694
Input availability (seed, fertilizer, pesticide)	1.000	0.601
Digital platforms for selling produce	1.000	0.870

Extraction Method: Principal Component Analysis

The communalities indicate the extent to which the extracted factor explain the variance of each variable. In the present study, the extraction communalities range from 0.601 to 0.861, demonstrating that a substantial proportion of variance in all variables is accounted for by the factor solution. Variable such as market price information (0.861) exhibit the highest communalities, highlighting their central importance in addressing farmer's information needs through digital means. Other variables, includeing crop production practices (0.805), farm mechanization (0.772), soil testing and fertility management (0.699), post-harvest handling and storage (0.763), also showed strong representation in the extracted factor. Even variable with comparatively lower communalities such as input availability (0.601) and irrigation and water management (0.627), remained within acceptable limits, confirming their meaningful contribution to the overall factor structure.

The number of components to be retained was determined using the Kaiser criterion and visual inspection of the scree plot. The scree plot shows a sharp decline in eigenvalues after the first few components, followed by a clear levelling-off the curve, indicating diminishing marginal contributions of subsequent components. Based on eigenvalues greater than one and the distinct break observed in the plot, five components were retained, which together explain a substantial proportion of the total variance in farmer's information needs.

Table 5

Table 5 Total Variance Explained by Principal Components

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.385	35.903	35.903	5.385	35.903	35.903
2	1.906	12.705	48.608	1.906	12.705	48.608
3	1.477	9.849	58.457	1.477	9.849	58.457
4	1.250	8.336	66.793	1.250	8.336	66.793
5	1.082	7.216	74.009	1.082	7.216	74.009
6	0.792	5.283	79.291			
7	0.653	4.356	83.647			
8	0.570	3.799	87.447			
9	0.462	3.082	90.529			
10	0.340	2.269	92.798			
11	0.319	2.127	94.925			
12	0.305	2.036	96.962			
13	0.233	1.552	98.514			
14	0.149	0.996	99.510			
15	0.074	0.490	100.000			

Extraction Method: Principal Component Analysis

Figure 1

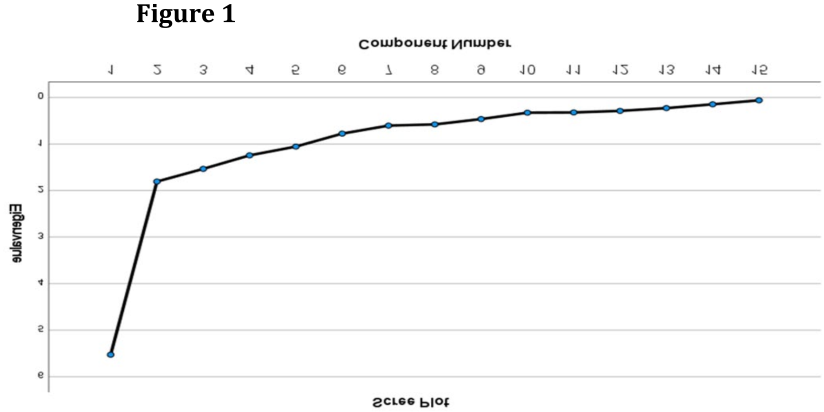

Figure 1 Scree plot of eigenvalues for farming information

Table 6

Table 6 Rotated Component Matrix for Farming Information

Component	1	2	3	4	5
Organic/natural farming practices		0.637			
Crop production practices	0.751				
Seed/variety selection		0.672			

Post-harvest handling/storage	0.756				
Government schemes & subsidies			0.717		
Credit/loan facilities			0.674		
Farm mechanization		0.748			
Weed management		0.739			
Weather forecast	0.85				
Pest & disease management	0.637				
Market price information		0.833			
Soil testing & fertility management				0.856	
Input availability (seed, fertilizer, pesticide)				0.668	
Irrigation & water management			0.76		
Digital platforms for selling produce					0.909

The rotated component matrix (Table 6) provides a clear and interpretable grouping of the fifteen information variables into five distinct components within the context of ICT enabled agricultural extension.

Component 1- climate and crop protection information

This component shows high loadings for weather forecast (0.850), pest and disease management (0.834), post-harvest handling and storage (0.756), and crop production practices (0.751). The grouping of these variables reflects farmers strong dependence on timely climatic and protective information to manage production risks, reduce pest-related losses and improve post-harvest outcomes. The prominence of this component highlights the central role of real-time and risk-mitigating information in farmers' decision-making processes.

Component 2- Market-Oriented production information

High loadings on market price information (0.833), farm mechanization (0.748), weed management (0.739), seed/variety selection (0.672) and organic/natural farming practices (0.637) characterize this component. This dimension represent market-responsive production behavior, where price signals, technology choices and sustainable practices influence cropping decision and operational efficiency.

Component 3 -Institutional and financial support information

This component mainly includes information related to irrigation and water management (0.760), credit and loan facilities (0.674), and government schemes and subsidies (0.559). The clustering of these variables highlights the importance of institutional and financial information in enabling access to resources, policy support and infrastructure necessary for farm development.

Component 4- Soil and input management information

This component exhibits high loading for soil testing and fertility management (0.856) and input availability (seed, fertilizer and pesticide) (0.668). This factor emphasizes the significance of soil diagnostics and timely input availability in enhancing crop productivity through informed and precise farm management decisions.

Component 5– Digital marketing and platform-based information

The fifth component is dominated by the digital platform for selling produce (0.909), indicating the growing relevance of ICT-based marketing channels. This component highlights the role of digital market places in improving market access, reducing dependency on intermediaries and enhance farmers income realization, even though current demand for such information remains relatively lower compared to production-oriented needs.

3.2. THE USE OF DIGITAL INFORMATION SOURCES FOR ACCESSING AGRICULTURAL INFORMATION

Table 7

Table 7 Eigenvalues of the Correlation Matrix			
	Eigenvalue	**Percentage of Variance**	**Cumulative**
1	2.60002	28.89%	28.89%

2	1.42561	15.84%	44.73%
3	1.21398	13.49%	58.22%
4	0.93128	10.35%	68.57%
5	0.8993	9.99%	78.56%
6	0.73084	8.12%	86.68%
7	0.52323	5.81%	92.49%
8	0.42144	4.68%	97.17%
9	0.25431	2.83%	100.00%

Table 8

Table 8 Extracted Eigensvalue

Variables	Coefficients of PC1	Coefficients of PC2
YouTube tutorials	0.02814	0.50298
Facebook/Instagram Agri pages	0.36727	0.39959
Mobile-based Agri apps (Kisan Suvidha, TNAU, etc.)	0.43665	-0.37388
Government portals (e-NAM, m-Kisan, Pm kisan, etc.)	0.45947	0.09124
SMS/IVR-based advisories	0.10141	-0.56182
Online webinars/training sessions	0.12427	0.33508
E-commerce apps for farm inputs	0.38005	-0.10123
Weather forecast apps	0.53635	0.02853
Krishi Vigyan Kendra (KVK) digital platforms	-0.6863	0.01568

Figure 2

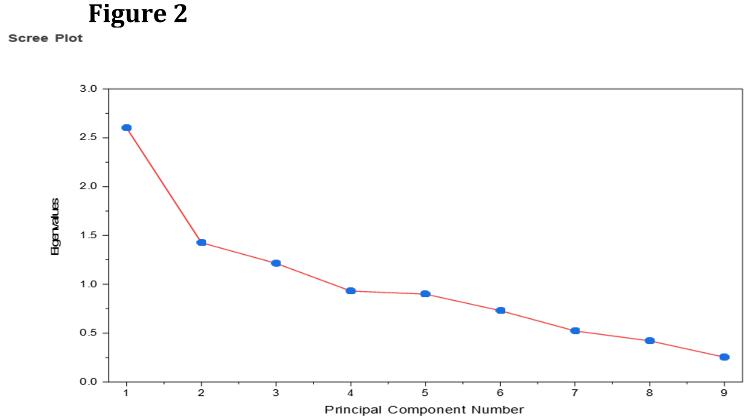

Figure 2 Scree plots illustration the eigenvalues and percentage of variance explained by principal component

The scree plot illustrates the distribution of eigenvalues across the principal components, reflecting the proportion of total variation explained by each component. A steep decline in eigenvalues is observed from the first to the second principal component, followed by a gradual reduction in subsequent components, diminishing marginal contribution. This pattern suggests that the first two principal component capture the majority of the variation present in the dataset, while later components contribute relatively less explanatory power.

The dominance of PC1 is evident from its comparatively higher eigenvalue, highlighting its importance in explaining the overall variability among ICT-based agricultural information sources. This indicates that ICT tools loading strongly on PC1 play a crucial role in shaping farmer's information access and utilization patterns. Consequently, greater emphasis in PC1-related sources would be beneficial for strengthening digital agricultural extension services.

The eigenvector coefficients further reveal the contribution of individual ICT tools to each principal component. PC1 is primarily influenced by weather forecast app (0.536). Government portals such as e-NAM and m-kissan (0.459), mobile-based agricultural applications (0.437), e-commerce app for farm inputs (0.380) and social media agricultural page (0.367). This component represent a formal and semi-formal digital information ecosystem, combining official platform, mobile application, and data-driven advisory services that support farm decision- making.

In contrast, PC2 is characterized by high positive loadings for you tube tutorials (0.503), fakebook and Instagram agriculture pages (0.400), and online webinars and training session (0.335), while SMS/IVR-based advisories (-0.562) and mobile-based agricultural apps (-0.374) show negative loadings. This component reflects a content-driven and interactive digital learning dimension, where visual, participatory and social media-based platforms dominate information dissemination, contrasting with traditional text or voice-based advisories.The PCA results demonstrate that a limited number of principal components are sufficient to explain most of the variability in farmer's use of ICT tools. PC1 emerges as the most influential component, capturing the core digital infrastructure supporting agricultural information access, while PC2 highlights emerging learning-oriented and social media-driven information channels. These findings confirm that ICT based agricultural extension is interactive multimedia tools, which together account for the major patterns of information utilization among farmers.

Figure 3

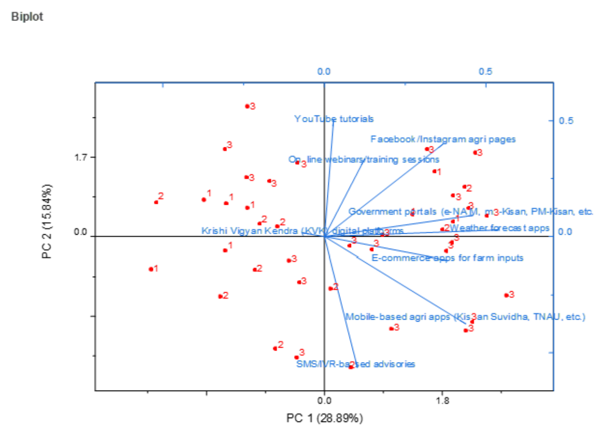

Figure 3 PCA biplot

3.3. THE PERCEIVED EFFECTIVENESS OF DIGITAL AGRICULTURE INFORMATION

The percentage analysis of farmers responses to six statements revealed large differences in farmers perceived effectiveness of the digital agricultural information (Ragasa and Niu, 2023). Figure 4 shows that market-oriented digital tools emerged as the most effective source of digital information, with 80 percent of farmers agreeing that market price applications assist them in getting better returns, indicating the high economic relevance of price-related digital information (Aker et al., 2023; Mishra et al., 2024).

Figure 4

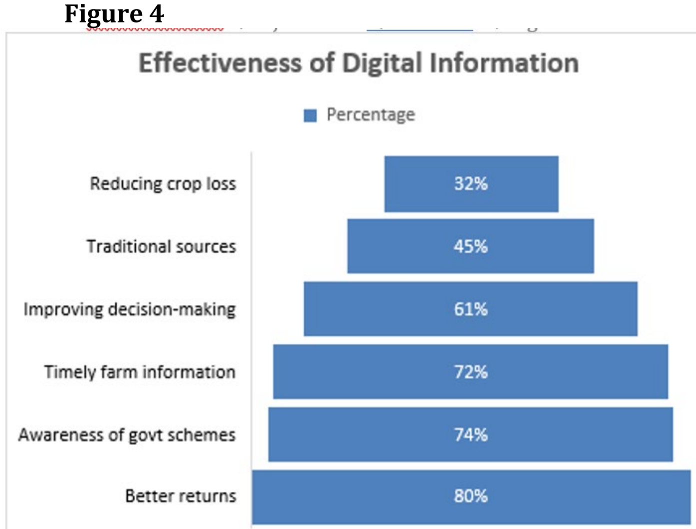

Figure 4 Effectiveness of digital information

This indicates that real time market intelligence provided by the digital platforms are more highly appreciated, and contribute to marketing decisions and revenue generation, as 72 percent of farmers reported that digital platforms provided timely farm information while 4 percent indicated that online information increased awareness of government schemes (Kassem & Alotaibi, 2024).

These findings reflect the rapid diffusion of information through digital channels and the limitations of traditional extension mechanisms in disseminating policy updates and institutional programs with comparable speed. With regard to farm-level decision-making, 61 per cent of farmers agreed that digital information helps them make better decisions, but only 32 per cent agreed that digital tools reduce crop loss. This suggesting that, although digital information aids awareness and planning, it does not always translate to physical risk-reduction outcomes.

Trust perceptions also highlight the limited effectiveness of digital agricultural information, with only 45 per cent of farmers trusting digital farm advisories more than traditional sources, indicating a continued need for traditional extension agents and peer networks (Aker et al., 2023). The findings reveal that digital agricultural information is most effective for economic and time sensitive information, such as information about market prices and government. On the other hand, effectiveness is more low-risk and high-trust results. These results indicate that although digital platforms have increased access to information awareness, further efforts are needed to strengthen advisory credibility, improve contextual accuracy and integration with on-ground extension services to increase impact on crop risk management and farmer trust.

3.4. CONSTRAINTS FACED BY FARMER IN ACCESSING AND UTILIZING DIGITAL INFORMATION

The constraints faced by farmers in using digital agricultural information were assessed using the percentage distribution of responses to seven constraints statements as represented in figure 5. The results indicate that infrastructural, skill-related and trust-related factors influence farmers willingness to use digital platforms. The most important barriers identified were poor internet connectivity and a large number of farmers strongly agreeing that inadequate network coverage in village their use of digital tools. The results suggest that ICT-based agricultural extension services must address the rural-urban digital divide to be effective for rural farmers. Rural areas often experience low band width and lack stable internet connectivity (Aliyu et al.,2025).

Unawareness of recommended agricultural practices emerged as the most common challenge. Assessing credible and relevant digital platforms was acknowledged as difficult by many of the participants, indicating low level of digital literacy and limited extension support. A related issue is that mobile applications can be difficult to navigate without proper training, suggesting that access to smartphones alone is insufficient for the effective use of digital information (Manzoor et al., 2025). Language also act as a barrier to digital adoption. Many farmers agree that language is a barrier to digital adoption as the information is often not available in the local language. This highlights the importance of developing context-specific and linguistically accessible content to enhance digital inclusive. Furthermore, despite the increasing availability of smart devices, farmer continue to cite the cost of smartphones and internet recharges as a constraint. As a result small and marginal farmers remain less likely to use digital platforms regularly.

Farmers' dependence on digital tools was found to be moderated by trust-related issues. Many respondents reported low confidence in online market transactions and expressed concerns about the accuracy of information available on digital platforms. This perception reflects apprehensions regarding price, manipulation, misinformation, and the absence of effective grievance redressal mechanism in online market places (Zewdie & Mekonnen, 2024). The findings suggest that although digital technologies offer significant potential for the dissemination of agricultural information, their effectiveness is constrained by factors such as lack of infrastructure, skill gaps, language barriers, economic expenses and a lack of trust. Enhancing the sustainability and inclusivity of digital agricultural extension system requires addressing these challenges.

Figure 5

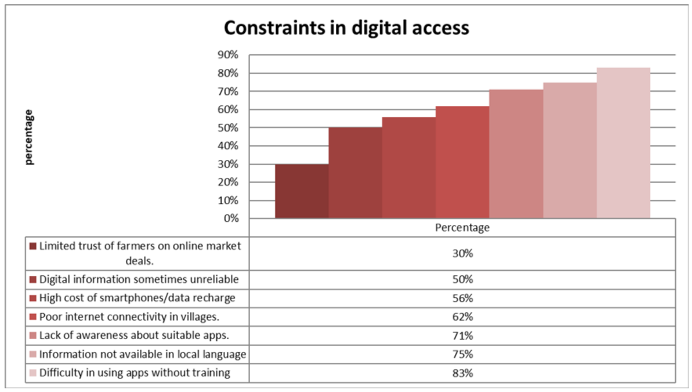

Figure 5 Constraints in Digital Access

3.5. POLICY AND EXTENSION IMPLICATIONS FOR IMPROVING DIGITAL INFORMATION DELIVERY SYSTEM

Farmers ranked preference scores for eight proposed interventions for strengthening digital agricultural information services, which provides insight into farmer-driven priorities for improving the accessibility, relevance and effectiveness of digital platforms (Klerkx et al.,2024). The top-ranked suggestion was training on digital literacy, with most respondents indicating a high preference for structured training on the use of smartphones, mobile applications and online platforms (Aranguri et al.,2025), further highlighting the demand for capacity-building initiatives in addition to technological deployment.

The second most favored recommendation involved the development of farm application in local languages to enhance understanding, confidence and regular use of digital tools which aligns with previous studies on language barriers and need for localization (Jonathan Steinke et al., 2024). Farmers also expressed a strong preference for short demonstration videos, particularly through YouTube as visual content is easier to understand for new practices such as crop management pest control and machinery operation (Jonathan Steinke et al., 2024).

Similarly, voice-based advisories were preferred over SMS (indicating that low-bandwidth and user-friendly communication formats are highly relevant). A moderate-to-high preference for peer-to-peer learning group(suggest that farmers value shared experiences and collective leaning through online platforms. Additionally suggesting local help centers for the digital services received strong acceptance (highlighting the need for ground-level support to complement) digital Extension efforts.

Farmers moderately preferred subsidies for smartphones and internet data pack, indicating their awareness of the economic barriers to adopting digital technologies (Abdulai et al. 2023). Farmers also highly preferred government-certified applications that provide authentic and credible advice, indicating a high levels of trust in digital advisory services as well as a need for more integrated approaches to digital extension. Such approaches should focus based on skill development, localized content, visual learning tools, affordability and institutional credibility (Abdulai et al. 2023).

Figure 6

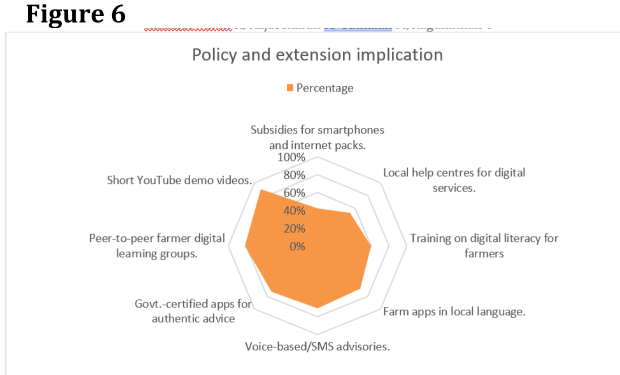

Figure 6 Policy and extension implications for improving digital information

4. CONCLUSION

This study helped to an understanding of the types of agricultural information farmers require and how digital platforms support them in accessing such information. The findings clearly shows that farmers mainly seek for practical information that can directly enhance their farming activities (Jonathan Steinke et al., 2024). Among the various types of information, soil testing and fertility management received the highest score, indicating that farmers give more importance on information that helps maintain soil health and improve crop productivity. This result also suggest that farmers are increasingly using digital sources to obtain a agricultural information. Weather forecasting services were identified as one of the most frequently used digital information sources, as farmers rely on timely weather updates to plan their farming operations effectively.

The use of digital agricultural information has shown positive outcome in certain areas. A large proportion of farmers reported that market price applications help them get better returns for their produce. This indicates that digital tools are playing an important role in improving farmers awareness of market price and supporting better selling decisions. However, several challenges persist, challenges persist, including difficulty in using mobile application without adequate training. Language also emerged as a significant barrier for many farmers.

These findings demonstrate that, despite the availability of digital technologies, farmers require proper training and support to adopt them effectively. Farmers also provide valuable recommendations for improving the delivery of digital agricultural information, such as a preference for short demonstration videos (e.g., You Tube) for visual explanations and peer to peer learning platforms.

It is therefore essential to address the problem and constraints faced by farmers in accessing agricultural and allied information through the coordinated efforts of various stakeholders, including government and non-government agencies, Extension services, and both technical and non-technical institutions. Improving access to information and ensuring its effective utilization can enhance the ease of information dissemination and ultimately contribute to increased agricultural productivity through the adoption of scientific practices.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

REFERENCES

Abdulai, A.-R., Owusu, V., & Goetz, R. (2023). Is agricultural digitization a reality among smallholder farmers in Africa? Agriculture & Food Security, 12. https://doi.org/10.1186/s40066-023-00416-6

Ahmadi, S., Amendolagine, V., & LaSala, P. (2025). Unpacking the impacts of digitalization of knowledge transfer in agri-food sector, through sociotechnical systems theory: A systematic literature review. Agricultural and Food Economics, 13, 51.https://doi.org/10.1186/s40100-025-00393-3

Aker, J. C., Ghosh, I., & Burrell, J. (2023). The promise (and pitfalls) of digital agricultural market information systems. World Development Perspectives, 31. https://doi.org/10.1016/j.wdp.2023.100517

Aker, J. C., Ghosh, I., & Burrell, J. (2023). The promise (and pitfalls) of digital agricultural market information systems. World Development Perspectives, 31. https://doi.org/10.1016/j.wdp.2023.100517

Aliyu, U., Mohammed, A., & Lawal, A. (2025). Open access and the digital divide: Challenges and opportunities for libraries in the ICT era. Insight–Information, 7(1). https://doi.org/10.18282/ii717

Aliyu, U., Mohammed, A., & Lawal, A. (2025). Open access and the digital divide: Challenges and opportunities for libraries in the ICT era. Insight–Information, 7(1). https://doi.org/10.18282/ii717

Aranguri, M., H., Noblecilla, W., & Lucini, C. (2025). Digital literacy and technology adoption in agriculture: A systematic review of factors and strategies. AgriEngineering,7(9),296. https://doi.org/10.3390/agriengineering7090296

Daudu, S., Abubakar, M., & Lawal, A. (2025). Gendered access to e-logistics platforms in urban agriculture. Innovation and Entrepreneurship, 14, 23.

https://doi.org/10.3389/fsufs.2025.1621851

https://innovation-entrepreneurship.springeropen.com/articles/10.1186/s13731-025-00605-6

https://www.frontiersin.org/articles/10.3389/fsufs.2024.1455037/full

Jonathan Steinkeet al. (2024). Fostering social inclusion in development-oriented digital food system interventions. Agricultural Systems. https://doi.org/10.1016/j.agsy.2024.103882

Kassem, H. S., & Alotaibi, B. A. (2024). Digital platforms and farmers' access to extension and government programs. Sustainability, 16(3). https://doi.org/10.3390/su16031325

Klerkx, L., & Villalobos, P. (2023/2024). Are Agri Food Tech start-ups the new drivers of food systems transformation? Global Food Security. https://doi.org/10.1016/j.gfs.2023.100726

Manzoor, F., Wei, L., Siraj, M., Lu, X., & Qiyang, G. (2025). Digital agriculture technology adoption in low and middle-income countries-A review of contemporary literature. Frontiers in sustainable food system, 9, 1621851.

Mekonnen, T. (2024). Agricultural innovation systems and digital transformation approaches.https://doi.org/10.3389/fsufs.2024.1470442

Ragasa, C.,& Niu, C. (2023). The effectiveness of ICT-based agricultural extension services. Global Food Security, 37.https://doi.org/10.1016/j.gfs.2023.100683

Shitaye, Z., Teshome, M., & Gebremedhin, B. (2024). Sources and intensity of access to agricultural information technologies by smallholder farmers. Frontiers in Sustainable Food Systems, 8, 1455037.

Vishal. V. Ambedkar, Ssekabira Robert, and Matthew Mildred Kalapili. 2025. "A Factor Analysis of Key Determinants in the Fruits and Vegetables Value Chain". Asian Journal of Agricultural and Horticultural Research 12 (4):1-12.https://doi.org/10.9734/ajahr/2025/v12i4409

Zewdie, A., & Mekonnen, D. (2024). Sources and intensity of access to agricultural information technologies by smallholder farmers. Frontiers in Sustainable Food Systems.https://doi.org/10.3389/fsufs.2024.1455037