International Journal of Agriculture and Environmental Research

ISSN: 2455-6939

Volume: 12, Issue: 03 "May-June 2026"

PERCEIVED EFFECTS OF INFORMATION SOURCES ON ADOPTION OF STANDARD CASSAVA PRODUCTION PRACTICES AMONG FARMERS IN IMO STATE, NIGERIA

Festus Nnamdi[1]; Nwaiwu, Juan Chinatu[2]; Onubuogu, Gilbert Chinedu[2]; Obichere, Chinwe Nnene[1]; Ofoegbu Onyinyechi Grace[3] and Obinwa, Augusta Ujunwa[4]

[1]Department of Agricultural Extension, Federal University of Technology Owerri, Imo State, Nigeria

[2]Department of Agricultural Extension, Federal University of Technology Owerri, Imo State, Nigeria

[3]Department of Crop Science and Biotechnology, Imo State University Owerri, Nigeria

[4]Department of Environmental Science and Management Technology, Federal College of Agriculture Ishiagu, Ebonyi State

DOI: https://doi.org/10.51193/IJAER.2026.12311

Received: 04 May 2026 / Accepted: 25 May 2026 / Published: 10 Jun. 2026

ABSTRACT

Cassava remains a major staple crop in Nigeria, yet productivity in Imo State is still below potential due to low and inconsistent adoption of standard production practices. This gap has been largely linked to inadequate and ineffective agricultural information dissemination systems, where farmers depend on multiple information sources that vary in credibility and accessibility. Against this background, the study examined the perceived effects of information sources on the adoption of standard cassava production practices among farmers in Imo State, Nigeria. Specifically, it identified the various sources of information available to cassava farmers, assessed their perceived effects on adoption, and examined the barriers farmers face in accessing agricultural information. A multi-stage sampling procedure was adopted to select 180 cassava farmers across the three agricultural zones of Imo State. Data were collected using structured questionnaires and analyzed using descriptive statistics and a 4-point Likert scale. Findings revealed that cooperative groups (97.78%), social gatherings (96.67%), and fellow farmers (92.78%) were the most prominent sources of information, indicating strong reliance on informal and community-based channels. The study further showed that information sources positively influenced adoption of standard cassava production practices, with an aggregate mean score of 3.02, highlighting improvements in awareness, technical knowledge, accelerated adoption, and strengthened farmer-extension linkages. However, major constraints such as high cost of ICT devices (95.42%), poor knowledge

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of information access (87.29%), inadequate electricity supply (73.46%), and weak extension services (53.82%) significantly limited farmers' access to reliable information. The study concludes that while information sources positively influence adoption, structural and institutional barriers hinder effective information dissemination. It recommends strengthening extension systems, improving rural ICT infrastructure, and integrating informal and formal information channels to enhance cassava productivity in the study area.

Keywords: Cassava Production; Information Sources; Adoption; Extension Services; Agricultural Innovation; Rural Farmers; ICT Access; Agricultural Information Dissemination

1.0 INTRODUCTION

Cassava (*Manihot esculenta*) is a critically important staple crop in sub-Saharan Africa, particularly in Nigeria, where it contributes significantly to food security, rural livelihoods, and industrial development. Nigeria remains the largest producer of cassava globally, accounting for a substantial proportion of total world output (Food and Agriculture Organization [FAO], 2026). The crop is widely valued for its resilience, including its adaptability to diverse agro-ecological conditions, tolerance to drought, and ability to perform well on marginal soils where many other crops fail. Beyond its role in household food consumption, cassava is an essential raw material for several agro-industrial applications, including the production of starch, ethanol, and animal feed (Esiobu et al., 2026). Despite its strategic importance, cassava productivity in Nigeria particularly in Imo State remains below its achievable potential. This shortfall is largely attributed to the limited adoption of improved and standardized cassava production practices among smallholder farmers. Over the years, agricultural research institutions and extension systems have developed and promoted a broad range of innovations designed to enhance arable crops including cassava productivity, improve resistance to pests and diseases, and increase farmers' incomes (Esiobu et al., 2025). These innovations include improved cassava varieties, recommended agronomic practices, and integrated soil fertility and pest management techniques. However, the adoption of these technologies has remained inconsistent and relatively low. This persistent gap between technology generation and utilization points to a fundamental weakness within the agricultural innovation system, particularly in the dissemination and effective use of agricultural information. Information plays a pivotal role in shaping farmers' decision-making processes and their willingness to adopt new technologies. Farmers rely on diverse sources of information to acquire knowledge about improved agricultural practices, and these sources differ in terms of accessibility, credibility, timeliness, and relevance. Such differences significantly influence farmers' perceptions and, ultimately, their adoption behavior (Maldayo et al., 2023). In this context, information sources refer to the various channels through which farmers obtain knowledge, advice, and guidance related to agricultural production. These sources may be broadly categorized into formal and informal channels. Formal sources include extension agents, research institutions, government

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agencies, and non-governmental organizations, while informal sources encompass fellow farmers, family members, and community-based networks. In addition, mass media platforms such as radio and television, as well as digital tools including mobile phones and internet-based services, have become increasingly important in modern agricultural information systems (Owolabi & Yekinni, 2022). The effectiveness of these sources depends largely on their accessibility, credibility, frequency of interaction, and relevance to farmers' specific needs. Closely linked to information access is the concept of adoption, which refers to the decision and sustained use of a new technology or practice by farmers after becoming aware of its existence. Adoption goes beyond initial experimentation and involves the full integration of the innovation into the farming system. It is typically a multi-stage process encompassing awareness, interest, evaluation, trial, and eventual utilization (Rogers, 2003). The adoption process is influenced by several factors, including farmers' socio-economic characteristics, institutional support systems, perceived benefits and risks associated with the innovation, and the nature and quality of information received. A major challenge confronting cassava production in Imo State is the fragmented and inadequate flow of agricultural information to farmers. Extension services, which are expected to function as the primary interface between research institutions and farming communities, are often constrained by inadequate funding, insufficient staffing, and weak institutional capacity. This results in limited and irregular contact with farmers. Consequently, many farmers depend heavily on informal information sources such as peers and neighbors, which may not always provide reliable or up-to-date knowledge. Furthermore, the existence of multiple, and sometimes conflicting, information sources can create confusion, erode trust, and discourage farmers from adopting improved practices. In addition, information disseminated through formal channels is often insufficiently tailored to local socio-economic and agro-ecological contexts, thereby limiting its practical relevance and effectiveness (Mulungu et al., 2025). An equally important dimension of this problem is farmers' perception of the information sources themselves. Even when information is accessible, its influence on adoption decisions depends largely on how farmers perceive the credibility, reliability, and usefulness of the source. Information obtained from trusted and relatable sources such as experienced fellow farmers or accessible extension agents is generally more likely to be adopted than information from distant or less familiar channels. This highlights the importance of not only improving access to information but also enhancing the perceived effectiveness of different information dissemination pathways. Given these challenges, there is a compelling need to critically examine the influence of various information sources on the adoption of standard cassava production practices among farmers in Imo State. Such an investigation is essential for strengthening agricultural extension systems, improving the design and delivery of information services, and promoting the uptake of productivity-enhancing innovations.

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Ultimately, a better understanding of these dynamics will contribute to increased cassava productivity, improved farmer incomes, and enhanced food security. Specifically, the study identified the various sources through which cassava farmers obtain information on standard production practices; assessed the perceived effects of these information sources on the adoption of such practices in the area and identified barriers farmers face in accessing information in the area.

2.0 MATERIALS AND METHODS

From March, 2025 through April, 2026, the study was conducted in Imo State of Nigeria. Imo State is located in the South Eastern zone of Nigeria and lies between latitudes 5° 45′N and 6^0 35′N of the equator and longitude 6^0 35′E and 7^0 28′E of the Greenwich Meridian [(Nigerian Meteorological Agency (NiMET), 2020)]. The State is bordered by Abia State on the East and Northeast, Rivers State on the South, Anambra State to the North and Rivers State to the South. Imo State is divided into three (3) agricultural zones of Owerri, Orlu and Okigwe and twenty-seven (27) Local Government Areas. With a total land area of 5,530km^2, the State has an estimated population of about 4.8 million persons and an annual growth rate of 3.35 percent [(Nigeria Populations Commission (NPC), 2006)]. The population of Imo State varies from 230 persons per kilometer square in Oguta/Egbema areas to about 1400 persons per kilometer square in Mbaise, Mbano, Orlu and Mbaitoli areas [(National Boundary Commission (NBC) of Nigeria, 2020)]. The sample for the study was drawn from cassava farmers in Imo State, Nigeria. A multi-stage sampling procedure was adopted in the selection of respondents for the study. Purposive sampling procedure was used to select areas with high intensity of cassava production. Therefore, at the first stage, the three (3) Agricultural zones (Okigwe, Orlu and Owerri) of the State were selected. This is intended to achieve data representing across every part of the State. The second stage involved a purposive selection of three (3) Local Government Areas (LGAs) in each ofthe three (3) agricultural zones where there is high intensity of cassava farming which gave a total of nine (9) LGAs. The third stage involved purposive selection of two (2) communities each from each of the selected LGAs, to give a total of eighteen (18) communities for the study. The final stage involved random selection of ten (10) farmers each from the selected eighteen (18) communities making a total of one-hundred and eighty (180) cassava farmers for the study. A sampling frame which contained the current list of cassava farmers was obtained from Imo State Agricultural Development Programme (Imo-ADP) and Cassava Farmers Association Imo State Chapter. Primary data were used for the study. Data were collected through the use of structured questionnaires and oral interviews were also used in places where the respondents could neither read nor write. The questionnaire was properly subjected to content validity with the help of the research supervisors before administering it to the respondents. The primary data collected for the study were various sources through which cassava farmers obtain information on standard production practices;

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perceived effects of these information sources on the adoption of such practices in the area and constraints farmers face in accessing information in the area. The study employed descriptive tools and mean score in analyzing the data for the study. Precisely, descriptive statistical tools such as the frequency distribution, percentages and mean ($\bar{x}$) were used to realize the objectives (i), (ii) and (iii). In particular, for objective (ii), a 4-point Likert type scale rating was used to obtain data on perceived effects of information sources on adoption of standard cassava production practices and then divided by the number of scales to obtain the discriminating index, for example, (4+3+2+1)/4 = 2.50 cut-off point. It was stated as follows;

SA = Strongly agreed (4)

A = Agreed (3)

D = Disagreed (2)

SD = Strongly Disagreed (1)

Decision Rule; Any mean score value below 2.50 was not accepted while mean value of 2.50 and above was accepted.

Table 1: Summary of Sampling Procedure and Sample Size

S/No	Agricultural Zones	Purposive Selection of LGAs	Purposive Selection of Communities	Total Number of Cassava Farmers Selected	Total Number of Cassava Farmers Selected
1	Orlu	3 (Ideato-South; Ideato-North and Orlu)	9 (Ubiohia; Ntueke; Umuchima; Akokwa; Urualla; Uzill; Umuna; Ihitte-Owerre and Umudioka)	10	60
2	Owerri	3 (Ngor-okpala; Ikeduru and Oguta)	9 (Amaimo; Amakohia; Eziama-Ikeduru; Awa; Eguoma; Egwe; Ntu; Obike and Elelem)	10	60
3	Okigwe	3 (Onuimo; Ehime-Mbano and Ihitte-Uboma)	9 (Okwelle; Umuihi; Umuna; Umunumo; Umuezegwu; Nsu; Umuezeala; Ato-werem; Umuduru-Egbeaguru)	10	60
	Total	**09**	**18**	**30**	**180**

Source: Field Survey Data, 2025

3.0 RESULTS AND DISCUSSION

3.1 Various Sources of Information on Standard Cassava Production Practices

The finding of various sources of information on standard cassava production practices in the area is displayed in Figure 1. Figure 1, reveals that cooperative groups constituted the most prominent source of information, as reported by 97.78% of the respondents, ranking first. This was followed

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closely by social gatherings (96.67%) and fellow farmers (92.78%), which ranked second and third, respectively. These results highlight the dominance of interpersonal and community-based information channels in cassava production practices. Other notable sources included social groups (89.44%), community opinion leaders (83.33%), and religious gatherings (78.33%), ranking fourth, fifth, and sixth, respectively. The prominence of these sources underscores the importance of trusted social and cultural institutions in shaping farmers' production decisions. Furthermore, mobile phones/SMS services accounted for 73.33% of responses and ranked seventh, indicating a growing role of basic digital communication tools in agricultural information dissemination. Formal agricultural information channels such as extension agents (66.11%) and workshops/agricultural exhibitions (56.11%) ranked eighth and ninth, respectively. Although extension services remain a key conduit for technical and research-based knowledge, their relatively lower ranking may reflect challenges such as limited extension coverage, infrequent farm visits, and logistical constraints in the study area. Agricultural research institutes were cited by 29.44% of respondents, ranking tenth, suggesting limited direct interaction between farmers and research institutions. Mass media and advanced digital platforms were the least utilized sources. Print media (10.00%), radio (13.89%), social media platforms (5.00%), and television (2.78%) ranked eleventh to fourteenth, respectively. This low identification of print media, radio, social media platforms and television may be attributed to factors such as inadequate infrastructure, low literacy levels, limited access to electricity and internet services, and the perceived irrelevance of generalized media content to local farming realities. The high reliance on cooperative groups emphasizes the significance of collective action and peer-based learning in the dissemination of agricultural knowledge among smallholder cassava farmers. Cooperatives provide structured platforms for sharing experiences, pooling resources, accessing credit and inputs, and receiving technical guidance in a supportive environment (Atanasova et al., 2024). This finding is consistent with earlier studies that report a positive relationship between cooperative membership and the adoption of agricultural innovations through trust-based peer learning and group support systems (Wang & Xu, 2025).Similarly, the high ranking of social gatherings and fellow farmers confirms that informal interactions remain a critical avenue for knowledge exchange. In rural communities of Imo State, farmers frequently interact during community events, markets, and family gatherings, where farming experiences and indigenous knowledge are shared (Onyenekwe et al., 2024). Such informal networks facilitate rapid diffusion of information, particularly in situations where formal extension services are limited or irregular (Abdulai et al., 2023). Social groups, community opinion leaders, and religious gatherings further reinforce trust, validate information, and encourage the adoption of standard practices, as farmers are more inclined to act on advice from familiar and respected sources.

Although extension agents and research institutions play essential roles in introducing scientific innovations, their effectiveness may be constrained by institutional and resource-related

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limitations. Generally, the findings indicate that cassava farmers in the area rely on multiple sources of information, with a strong preference for community-based and interpersonal channels. This suggests that strengthening cooperative structures and social networks can significantly enhance the reach and effectiveness of information dissemination. Integrating formal extension services with existing informal channels, alongside targeted efforts to improve access to farmer-friendly digital and mass media platforms such as radio programs in local languages, mobile advisory services, and demonstration videos could further accelerate the adoption of standard cassava production practices (Gillies, 2023; Silvestri et al., 2020).

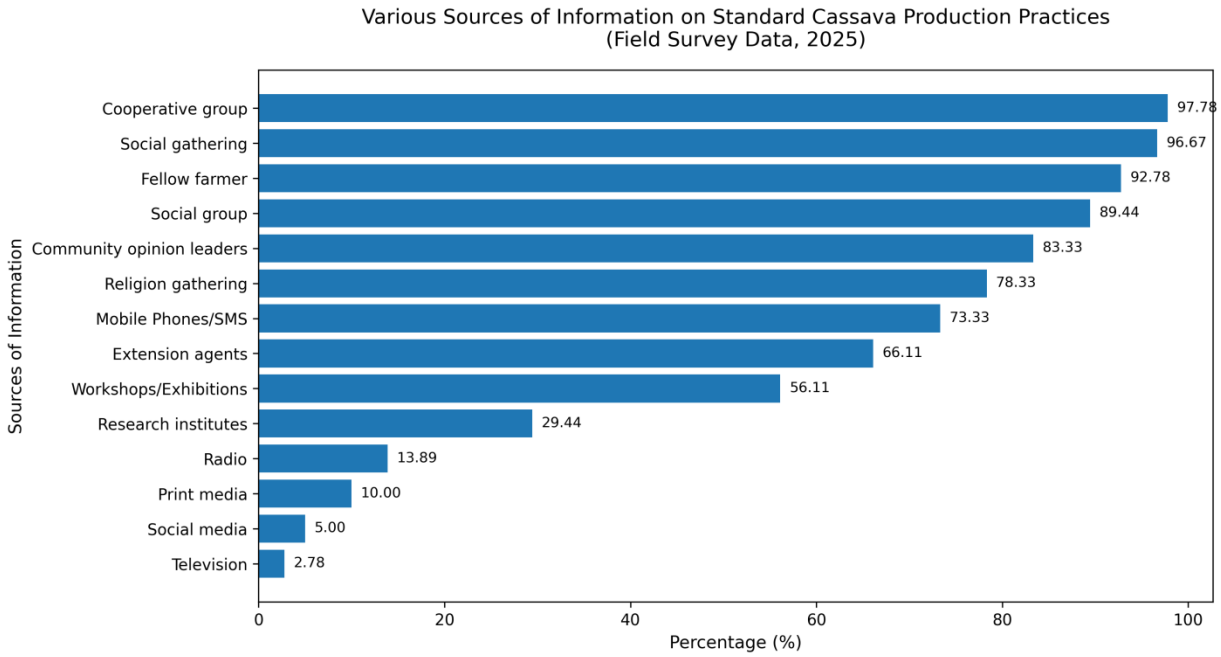

Figure 1: Various Sources of Information on Standard Cassava Production Practices

3.2 Perceived Effects of Information Sources on Adoption of Standard Cassava Production Practices among Farmers

The result of perceived effects of information sources on adoption of standard cassava production practices among farmers in the area is compiled in Table 3.2. The various attributes of perceived effects of information sources on adoption of standard cassava production practices among farmers were rated on a four-point Likert scale, ranging from Strongly Agreed (4) to Strongly Disagreed (1). The mean values represent the perceived effects of information sources on adoption of standard cassava production practices among the farmers, while the standard deviation values indicate the degree of variability in responses of the cassava farmers in the area. The analysis combines mean scores, which show the degree of agreement with each statement, and standard deviation values,

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which measure the variability of responses across cassava farmers. From the result, the overall aggregate mean score of 3.02 (σ = 0.73) shows that the cassava farmers agreed that information sources have a positive effect on their adoption of standard cassava practices in the area. The highest mean score was recorded for accelerated adoption of standard cassava production practices ($\bar{x}$ = 3.26, σ = 0.89). This suggests that information sources encouraged quicker adoption of standard cassava production practices. The higher standard deviation also implies that their responses were different and far from the mean. This finding supports Rogers' (2003) diffusion of innovation theory, which emphasizes the central role of communication channels and effective information sources in influencing adoption. Reduce in the risk of misleading information from informal sources also scored highly ($\bar{x}$ = 3.17, σ = 0.83), highlighting the role of credible information sources in countering misinformation often spread by peers, traders, or unverified local practices. This outcome is consistent with Magesa et al. (2024), who reported that reliable extension advice minimizes uncertainty and prevents yield losses caused by misinformation. Similarly, improved awareness of standard cassava production practices ($\bar{x}$ = 3.15, σ = 0.80) and enhanced technical knowledge of farmers ($\bar{x}$ = 3.03, σ = 0.72) were strongly perceived.

These results show that information sources were effective in disseminating knowledge on improved varieties, planting techniques, pest management, and harvesting practices. The moderate variability suggests that some farmers, especially those in remote areas, still had limited exposure, reflecting infrastructural and institutional gaps in extension service delivery. Bridging of knowledge gaps between farmers and extension agents ($\bar{x}$ = 3.06, σ = 0.78) and strengthened farmer-extension linkage systems ($\bar{x}$ = 3.11, σ = 0.76) further emphasize the value of structured communication platforms in building trust and sustaining the adoption process. These findings imply that strengthening farmer-extension networks enhances continuous learning and adaptation, which are critical for scaling up cassava production innovations (Kurvers et al., 2021). Economic outcomes were moderately perceived, as shown in increased sales and income of cassava tuber ($\bar{x}$ = 2.96, σ = 0.65) and promote time-saving decision making ($\bar{x}$ = 3.02, σ = 0.69). These scores indicate that while farmers recognized potential benefits, the direct link between information and income may not be immediate. Market access, storage facilities, and price fluctuations often mediate the extent of financial gains from improved practices (Ibikoule et al., 2024). In addition, increased confidence in use of standard cassava production practices ($\bar{x}$ = 2.64, σ = 0.57) was also perceived by the farmers to enhance the adoption of standard cassava production in the area. These findings underline that effective information sources are central to enhancing cassava productivity in the area. Finally, from the overall aggregate mean score and standard deviation ($\bar{x}$ = 3.01, σ = 0.73) which was above the discriminatory index shows that the cassava farmers agreed that information sources have a positive effect on their adoption of standard cassava practices in the area.

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Table 2: Perceived Effects of Information Sources on Adoption of Standard Cassava Production Practices among Farmers

n=180

S/No	Perceived Effects	SA	A	D	SD	Mean (x̄)	SD (σ)	Decision
1	Improved awareness of standard cassava production practices	50	104	25	1	3.13	0.80	Accepted
2	Enhanced technical knowledge of farmers	73	51	43	13	3.02	0.72	Accepted
3	Accelerated adoption of standard cassava production practices	60	109	8	3	3.26	0.89	Accepted
4	Increased confidence in use of standard cassava production practices	30	68	70	12	2.64	0.57	Accepted
5	Increased sale and income of cassava tuber	52	81	36	11	2.96	0.65	Accepted
6	Promote motivation to participate in training and demonstrations	46	80	33	21	2.84	0.62	Accepted
7	Bridging of knowledge gaps between farmers and extension agents	70	59	42	9	3.06	0.78	Accepted
8	Reduces the risk of misleading information from informal sources on standard cassava production practices	90	40	41	9	3.17	0.83	Accepted
9	Strengthened farmer-extension linkage systems	82	50	33	15	3.11	0.76	Accepted
10	Promote time-saving decision making in adoption of standard cassava production practices	58	70	43	9	3.02	0.69	Accepted
	Aggregate Mean Score					**3.02**	**0.73**	**Accepted**

Key; SA: Strongly Agreed; A: Agreed; SD: Strongly Disagreed; D: Disagreed; SD (σ); Standard Deviation; Discriminatory index: Cut off point x̄≥2.50 Accepted; Field Survey Data, 2025

3.3 Barriers Cassava Farmers Face in Accessing Information in the area

Figure 2, presents the barriers affecting cassava farmers' access to agricultural information in Imo State, Nigeria. The findings reveal that high cost of ICT devices (95.42%) is the most severe barrier, followed by poor knowledge of how to access useful information (87.29%), inadequate electricity supply (73.46%), low literacy levels (60.13%), weak extension service delivery (53.82%), and weak linkage between research institutions and farmers (42.38%). These results provide a clear indication that farmers' access to agricultural information is constrained by a combination of economic, educational, infrastructural, and institutional factors. The dominance of

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high cost of ICT devices as the most critical constraint aligns with the study of Ayanwale and Kehinde (2025), that highlight affordability as a major determinant of ICT adoption among rural farmers. Closely related to this is the finding on poor knowledge of how to access useful information (87.29%), which reflects a major human capital limitation. This agrees with findings by Xaba et al. (2026), who opined that most farmers lacked the ICT skills required to search, interpret, and apply agricultural information effectively. It also supports the argument that access to information is not only about availability but also about the capacity to use it. Without adequate digital literacy and training, even available ICT infrastructure may remain underutilized, reducing the effectiveness of agricultural information systems. The issue of inadequate electricity supply (73.46%) further compounds the problem of ICT use among cassava farmers. This finding is consistent with rural infrastructure studies in Nigeria, which identify unstable electricity as a major bottleneck to ICT adoption in agriculture (Olaniyan et al. 2024). Electricity is essential for charging devices, powering communication networks, and supporting rural ICT hubs. In areas where power supply is irregular, farmers are less likely to rely on ICT-based information sources, thereby increasing dependence on informal and less reliable channels. The result showing low literacy levels (60.13%) is also significant. Education plays a critical role in determining farmers' ability to understand and adopt improved agricultural practices. This finding supports the work of Shitaye et al. (2024), who observed that farmers with higher educational attainment are more likely to access and utilize agricultural information effectively. Low literacy limits comprehension of extension messages, written instructions, and digital content, thereby reducing the effectiveness of information dissemination strategies. Furthermore, weak extension service delivery (53.82%) highlights institutional inefficiencies in agricultural knowledge dissemination. This finding aligns with Ukonu et al. (2022), who reported that inadequate extension contact reduces farmers' awareness of improved cassava production technologies in southeastern Nigeria. Extension agents are expected to serve as intermediaries between research institutions and farmers, but limited staffing, poor funding, and logistical challenges weaken their effectiveness. As a result, many farmers do not receive timely and accurate information on improved cassava production practices such as the use of high-yielding varieties, proper spacing, fertilizer application, and pest management. The final constraint, weak linkage between research institutions and farmers (42.38%), indicates a gap in the agricultural innovation system. This finding is consistent with the Agricultural Innovation Systems (AIS) framework, which emphasizes the importance of strong interactions between researchers, extension agents, and farmers (Daum et al., 2025). Olaniyan et al. (2024), noted that weak research-farmer linkages slow down the diffusion of agricultural innovations, leading to low adoption rates of improved technologies. In the absence of effective linkages, research outputs often fail to reach end users in a usable form.

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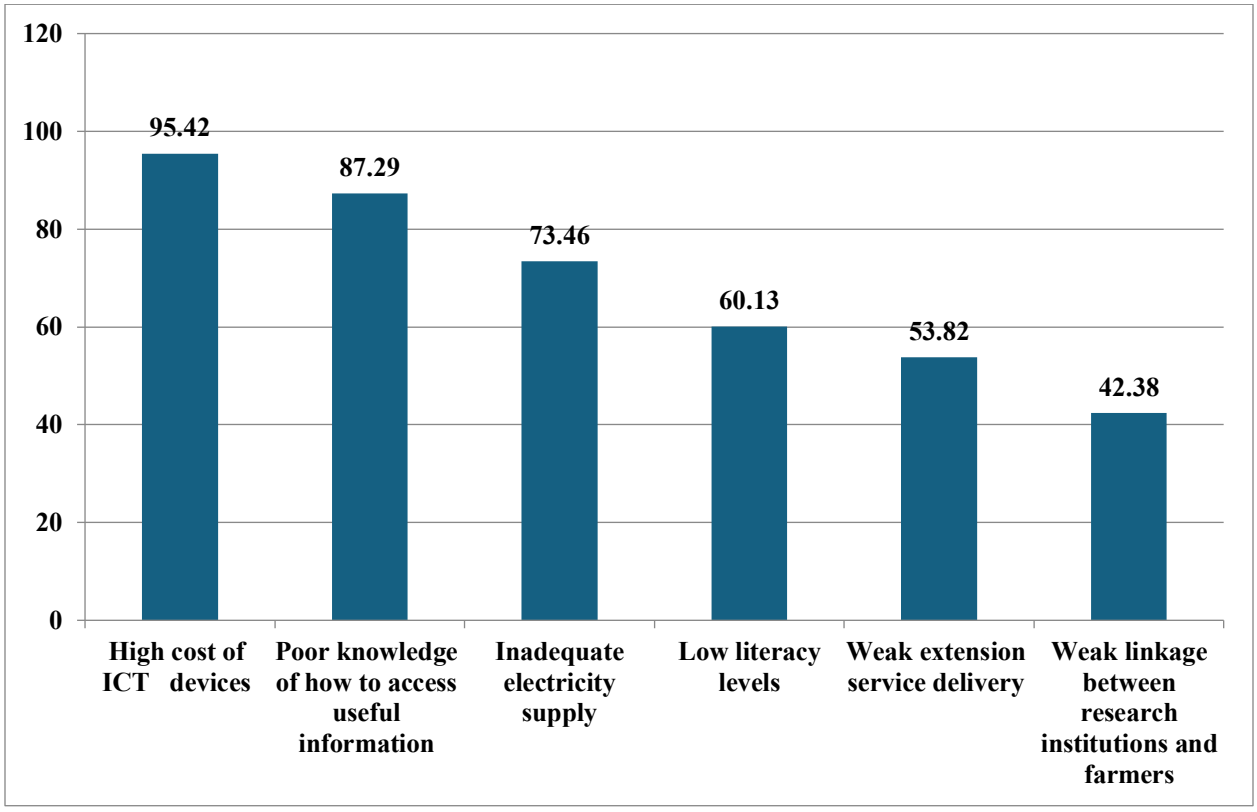

Figure 2: Barriers Cassava Farmers Face in Accessing Information in the area

3.4 Conclusions

The study established that cassava farmers in Imo State rely heavily on informal and community-based information sources such as cooperative groups, social gatherings, and fellow farmers for knowledge on standard cassava production practices. Although formal sources like extension agents and research institutions exist, their influence remains relatively limited due to weak institutional capacity and poor outreach. The perceived effects analysis showed that information sources significantly enhance farmers' awareness, technical knowledge, confidence, and adoption speed of improved cassava production practices. This confirms that effective communication channels are central to agricultural innovation adoption. However, the study also revealed that access to agricultural information is constrained by several interrelated barriers, including high cost of ICT tools, inadequate electricity supply, low literacy levels, poor ICT skills, and weak extension service delivery. These challenges collectively limit farmers' ability to access timely, accurate, and relevant agricultural information. Finally, while information dissemination has a positive influence on cassava production practices, its effectiveness is undermined by infrastructural and institutional deficiencies. Addressing these constraints is essential for

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improving cassava productivity and strengthening the agricultural innovation system in Imo State, Nigeria.

3.5 Recommendations

The following recommendations were made based on the major findings of the study.

i. From the study, it was found that weak extension service delivery limits farmers' access to reliable agricultural information. Therefore, government and agricultural development agencies should strengthen extension systems through adequate funding, recruitment of more extension agents, and provision of logistical support to ensure regular farm visits and effective information dissemination.

ii. It was also found that farmers depend largely on cooperative groups, social gatherings, and fellow farmers for information. Therefore, extension services should be integrated with these existing informal channels to improve trust, coverage, and effectiveness of agricultural information dissemination.

iii. From the study, high cost of ICT devices and inadequate electricity supply were identified as major barriers. Therefore, government and private sector stakeholders should improve rural electrification, subsidize ICT tools, and expand mobile network services to enhance farmers' access to digital agricultural information.

iv. It was found that poor knowledge of how to access useful agricultural information limits farmers' use of available resources. Therefore, regular training programs should be organized to improve farmers' ICT skills and ability to access, interpret, and apply agricultural information effectively.

v. From the findings, cooperative groups were the most important source of information. Therefore, cooperatives should be strengthened and supported as key platforms for training, information sharing, input distribution, and collective learning among cassava farmers.

vi. The study found weak linkage between research institutions and farmers. Therefore, research findings on cassava production should be simplified and effectively communicated to farmers through demonstrations, field days, and farmer-friendly extension materials.

vii. Since mass media and ICT platforms were underutilized, it is recommended that radio programs and other communication channels should be delivered in local languages to improve accessibility and understanding of improved cassava production practices among rural farmers.

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