Available on: https://jnsrr.ep-journals.org/ E-ISSN: 3051-3766 P-ISSN: 3051-3758

Journal of Natural Science Research and Review

Volume: 01 Issue: 03 September-2025

E-Resources Accessibility among Agricultural Researchers and Extension Personnel in North-Western Nigeria

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Published Date: September 05, 2025

ABSTRACT: This study examined the accessibility of electronic resources (e-resources) among agricultural researchers and extension personnel in North West, Nigeria. Specifically, the findings show their socio-economic characteristics and types of e-resources accessibility A multistage sampling procedure was adopted, in first stage, three of the States' ADPs out of seven (Katsina, Kano and Kebbi States) was purposively chosen, taking into cognizance on the need to give geographical representation, security situation and coverage of the Zone. In the second stage, based on the lists of the 715 NAERLS researchers (Frame) from various agricultural discipline obtained from the Institute (Population), 251 staffs were randomly and proportionately selected as recommended by Raosoft calculator. In the third stage, according to the list of 1431 (Frame) extension personnel's gotten from the three states ADPs, 443 extension personnels were sampled randomly and proportionately. This number was based on the recommendation of Raosoft calculator as response distribution. Thus, making the total sample size 694 selected proportionately for the study. Data were collected using structured questionnaires. Analytical tools included descriptive statistics were used. Results showed that respondents' ages ranged between 20 and 60 years, with a mean of 39.8 years, and the majority were males (90.38% and 55.6%) for extension personnels and researchers respectively, the findings also shows that majority were married 91.08% and 86.57%. The results underscore a pronounced disparity in digital infrastructure access and technological readiness between agricultural researchers and extension personnel in Nigeria's agricultural innovation system. Access to computers and smart devices remains critically constrained for extension personnel. Only 15.49% of extension agents reported unrestricted access to computers, with 26.53% indicating complete unawareness of such tools. Conversely, 95.9% of agricultural researchers enjoy full access. Similarly, smartphone/tablet availability reflects a comparable trend, with only 34.27% of extension agents having unrestricted access and 27% unaware of these tools.
It recommends targeted training, improved ICT infrastructure, and supportive institutional policies to enhance e-resource adoption for agricultural research and extension.

KEYWORDS: comparable trend, improved ICT infrastructure, agricultural innovation, e-resources adoption

INTRODUCTION

Background to the study

Agriculture has continued to be a catalyst in reducing poverty and enhancing food security in developing countries (Sazonova et. al, 2021). Similarly, it is the foundation for the supply of basic human needs and ensure that people at all times have physical and economic access to adequate amounts of safe and nutritious food (Donkoh et. al, 2019; Yokamo, 2020). As a rider to this, research and the activities of extension personnel are the catalyst to food security, in that researchers developed the technological packages, and conduct the trainings of extension agents on its applicability via theoretical and practical dimensions (Khudoynazarovich, 2021).

On the other hand, wider dissemination of information regarding development of farmer-skill, attitudes and practices for enhanced production and productivity, lies to extension personnels delivery (Kassem et. al, 2021).

Vast literatures on technology generations and disseminations have documented the impacts of researchers and extension agents in agricultural production. For instance, in France, Vanloqueren and Baret (2017) revealed that the National Institute for Agronomic Research (INRA) has developed a genetic engineering in agricultural value chain, which impacted in farmers' economic, health and environment through effective extension delivery. Similarly, in a West African country, Ghana research institute collaborative researchers' initiatives, encompasses 'exchanges, partnerships, networking and cooperation have become the norm for keeping abreast the pace of innovation in all sectors of the economy'. On the one hand, the training of high-level scientific manpower has led to the production of high skilled extension agents' capable of enhancing the

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positive yield outcomes from farmers' adoption of technology as pointed out by (Owusu-Nimo and Boshoff, 2017, Anang, Bäckman and Sipiläinen 2020) and Mohammed and Abdulai (2022) revealed that extension agents' dissemination of proven technology has led to significant increase in yield and income

This reality provides the justification for an empirical based impact assessment such as these. Thus, this study seeks to determine the e-resources accessibility among researchers and extension personnel in North-Western Nigeria. The specific objectives are to:

1. describe the socioeconomic characteristics of the respondents in the study area
2. examine e-resources accessibility by the researchers and the extension personnels at the research station and ADPs

This study was carried out in North-western, Nigeria, which falls within the Sudano-Sahelian agro-ecological zone (Abaje et al., 2015). The zone is composed of seven States, which are Kano, Kaduna, Katsina, Sokoto, Zamfara, Jigawa and Kebbi states. North-western Nigeria lies between latitude 14º to the North and 10º to the south and longitude 4º21 to the West and 10º151 to the East. It has boundaries with Niger Republic in the North, Bauchi, Yobe and Taraba States in the East, FCT, Niger and Nasarawa States in the South and Benin Republic in the West (Adefila and Madaki, 2014; Abaje et al., 2015).

MATERIALS AND METHODS

Sampling procedure and sampling size

The population of this study include researchers of the NAERLS that has a national mandate for research and training of the ADPs extension personnels across the 36 States of the Federation, and ADPs extension personnels. A multi stage sampling procedure was employed in this study. In first stage, three of the States' ADPs out of seven (Katsina, Kano and Kebbi States) was purposively chosen, taking into cognizance on the need to give geographical representation, security situation and coverage of the Zone. In the second stage, based on the lists of the 715 NAERLS researchers (Frame) from various agricultural discipline obtained from the Institute (Population), 251 staffs were randomly and proportionately selected as recommended by Raosoft calculator. In the third stage, according to the list of 1431 (Frame) extension personnel's gotten from the three states ADPs, 443 extension personnels were sampled randomly and proportionately. This number was based on the recommendation of Raosoft calculator as response distribution. Thus, making the total sample size 694 selected proportionately for the study.

Table 1: Sample Frame and Size

SN	Organizations	Sample Frame	Sample size
1	NEARLS Zaria (Researchers)	715	251
2	States ADPs (Extension personnel's)		
	Katsina	78	65
	Kano	1253	298
	Kebbi	100	80
	Total	**2146**	**694**

Source: Field work 2025

Data collection

The researcher collected data from both primary and secondary sources. The primary data were collected using structured questionnaire.

RESULT AND DISCUSSION

E-resources content accessibility by the researchers and the extension personnel's

The results from Table 2 underscore a pronounced disparity in digital infrastructure access and technological readiness between agricultural researchers and extension personnel in Nigeria's agricultural innovation system. Access to computers and smart devices remains critically constrained for extension personnel. Only 15.49% of extension agents reported unrestricted access to computers, with 26.53% indicating complete unawareness of such tools. Conversely, 95.9% of agricultural researchers enjoy full access. Similarly, smartphone/tablet availability reflects a comparable trend, with only 34.27% of extension agents having unrestricted access and 27% unaware of these tools. This stark technological exclusion significantly impairs the ability of frontline extension workers to participate in digital innovation processes, knowledge sharing, and farmer engagement. As Omotayo (2005) notes, access to ICT tools is foundational for modern agricultural communication, and such deficits weaken the effectiveness of extension service delivery.

Furthermore, of this study revealed that 28.4% of extension personnel reported consistent access, while 26.76% lacked basic internet usage skills. In contrast, 94.78% of researchers reported full internet access. These figures affirm FAO's (2020) observation that inadequate broadband infrastructure in rural settings constitutes a systemic constraint on agricultural knowledge flows, limiting extension agents' access to up-to-date research, real-time communication, and online learning platforms.

Similarly, one of the most critical insights pertains to training in e-resource utilization. The findings revealed that only 25.12% of extension personnel had received regular training, while 24.88% were unaware of any digital training programs, and 14.08% had never receive any trainings. In contrast, 92.91% of researchers reported regular engagement in digital skills development. This finding substantiates Arokoyo's (2005) position that context-sensitive and recurring training is essential to building ICT competencies among agricultural stakeholders. Training not only fosters digital literacy but enhances confidence, encourages innovation, and ensures more effective integration of digital tools into daily extension activities.

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These findings illuminate a systemic digital divide that favours researchers over extension agents affecting not only device and infrastructure access but also content creation capacity, connectivity, and professional development. Bridging this divide is essential for establishing an inclusive and integrated agricultural innovation system that empowers both knowledge producers and field-based disseminators.

Table 2: E-resources content accessibility by the researchers and the extension personnel's

E-Resource	Extension Personnels				Agricultural researchers			
	No, never had access	Unknown to me	Yes, unlimited access	Yes, but limited access	No, never had access	Unknown to me	Yes, unlimited access	Yes, but limited access
Computers	16.9	26.53	15.49	41.08	0.37	0.75	95.9	2.99
Tablet/Phones	7.51	27	34.27	31.22	0.37	0.75	95.9	2.99
Internet connectivity	9.39	26.76	28.4	35.45		0.75	94.78	4.48
Geographic information system (GIS)	18.08	26.53	20.66	34.74	2.24	4.1	80.97	12.69
Cameras	13.15	22.77	31.69	32.39	0.75	1.12	95.15	2.99
Audio recorders/Midgets	16.43	24.88	23.71	34.98	1.12	1.12	93.28	4.48
Flash drives/Hard disk for storage	24.88	118	79	123	1.12	1.12	95.9	1.87
DVD/VCD	31.92	26.76	16.9	24.41	0.75	1.87	94.03	3.36
DVD/CD Writer (use in for copying content on CDs/DVD)	34.04	26.76	15.96	23.24	0.75	1.87	94.03	3.36
DVD/CD player	31.22	25.35	15.96	27.46	1.49	2.99	96.64	3.36
Printers	27	52.58	68.78	31.22	0.37	1.49	96.27	3.73
Electrical power	24.18	50.47	69.48	30.52	0.37	1.87	95.52	4.48
Finances for radio programme airing	27.46	55.4	69.48	30.52	2.61	3.73	94.4	5.6
Finances for TV programme airing	28.17	56.57	69.25	30.75	3.36	4.48	95.52	4.48
Studio	35.21	63.85	77.23	22.77	0.75	2.24	94.4	5.6
Regular training	14.08	24.88	25.12	35.92	1.12	0.37	92.91	5.6

Source: Field Survey, (2025),

CONCLUSION

The findings of this study provide a comprehensive understanding of the socio-economic characteristics and digital competencies of agricultural extension personnel and researchers, and how these influence the adoption and utilization of electronic resources in agricultural communication and service delivery. The age distribution of respondents, ranging between 20 and 60 years with a mean of 39.81 years, reflects a predominantly active and productive workforce. The gender composition, skewed towards males (90.38% of extension personnel and 55.6% of researchers), underscores the persistent gender imbalance within the agricultural research extension system in Nigeria. Access to communication technologies was generally encouraging, with nearly all researchers (100%) and extension personnel (98.36%) reporting access to email. Nonetheless, traditional media such as television remain highly relevant, as 98.9% of researchers and 80.05% of extension personnel continue to rely on it for dissemination of agricultural information

RECOMMENDATIONS

Based on the findings of this research work the following recommendations were made to help improve the situation:
Government Policies should ensure inclusive access to devices and internet across all research institutes and ADPs.

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