Information Skills and Use of Agricultural research Outputs by Extension Workers for Information Dissemination to Farmers in North-West, Nigeria

By

Sanusi Mamman
University Library, FUT Babura
Mammansanusi4@gmail.com

Abubakar Musa Garba
University Library, Federal University Dutsinma
abubakarmusagarba@gmail.com

Lawal Ya'u
University Library, Al-Qalam University, Katsina

Abstract
The study investigated on Information Skills and Use of Agricultural research Outputs by Extension Workers for Information Dissemination to Farmers in North-West, Nigeria. The specific objectives is to identify information skills used in using agricultural research outputs by extension workers for dissemination of information to farmers in North-West, Nigeria and find out the different types of agricultural research outputs used by extension workers for the dissemination of information to farmers in the study area. The study adopted a descriptive survey research design and the population of the study comprises all the extension workers in seven (7) states which includes Jigawa, Kaduna, Katsina, Kano, Kebbi, Sokoto and Zamfara and Multistage cluster sampling technique was adopted to the study. Balloting method was applied to select the two states that serve as the clusters for the study. Eventually, Katsina and Kebbi were randomly selected to represent the population and which is two-thousand and thirty-four (2034). More so, 234 extension workers were chosen as the sample size of the study Using the guiding principle of Research Advisor's Table 2006.The questionnaire was used for data collection and data were analysed using means and standard deviation at 3.0 bench mark. The study's findings indicate that extension workers lack digital skills and predominantly use traditional print materials, such as journal articles and newspapers, for disseminating information to farmers, while the use of online resources is significantly lower. Based on this, the study recommended a need to enhance digital literacy and training for extension workers, thereby, organizing targeted training programs aimed at improving digital skills, including the use of online databases, search engines, and digital platforms for agricultural research and among others.

Key words: Information Skills, Use, Agricultural Research Outputs, Extension Workers, Information Dissemination, Farmers, North-west

Introduction
Agriculture is the largest sector of the Nigerian economy and employs the majority of the entire labour force in the Northern part of the country. However, the production hurdles have stifled the

performance of the sector. Agriculture is increasingly becoming knowledge-intensive and millions of small farmers around the world are confronted with constraints such as poor access to farm input, funding, and poor road networks (Abubakar, Garba, Gana & Jocob, 2019). The use of agricultural research output by extension workers in the provision of agricultural information can ease access to prompt and correct information for improved agricultural production.

According to Adam, Kandiwa, and Muindi (2019), agricultural research outputs are agricultural information resources that contain current and relevant agricultural information. Examples of such agricultural research outputs include journal articles, conference proceedings, student projects, theses and dissertations, and agricultural databases for example. These outputs are not only a critical factor in promoting agricultural production, but also a veritable source for access to education and information. To ensure the usefulness of agricultural research outputs, extension workers must possess the necessary skills to use its contents for the proper dissemination of current and relevant information to farmers. Angol and Ameh, (2017) have observed that information skills are key to utilizing appropriate agricultural research outputs as well. The use of agricultural research outputs is a global that has attracted the attention of many scholars and writers around the world.

For instance, Badamasi (2019) noted that information skills are fundamental in the use of digital resources including agricultural research outputs to information professionals like extension workers. By contrast, Saur-Munchin (2021) reported that there is serious concern about the issue of awareness of online agricultural research outputs in the UK, particularly about future information professionals and rural dwellers. However, in the opinion of Abubakar et. al. (2019), despite the issue of information skills there is a relative scarcity of extension services delivery and facilities to farmers especially those residing in rural areas. In the context of developing countries, many scholars have examined the role of the use of agricultural information sources like agricultural research outputs for extension service delivery that enable farmers to have access to and utilize the relevant agricultural information to improve agricultural activities (Angol & Ameh, 2017; Hossein, Mehrad & Gholamreza, 2019). These studies have highlighted issues such as lack of awareness and inadequate funding in agricultural extension systems as the major challenges distracting the effective use of agricultural research outputs. Therefore the study set to find out the information skills and use of agricultural research outputs for information dissemination to farmers in North-west, Nigeria.

Statement of the Problem

Agricultural research outputs such as technical reports like weather forecast reports, journal articles, books, conferences, and among others, are vital documents that is required to be used all the time by agricultural extension workers in the provision of agricultural information to farmers. The primary responsibilities of agricultural extension workers are to use various types of agricultural research outputs available, to inform and educate farmers to accept recent agricultural research findings, to improve farming practices to enhance their standard of living. However, the use of agricultural research outputs in developed countries is 60-70% compared to developing countries where it is below 50% (Abubakar et. al. 2019; FAO, 2022). This in turn refers to the situation, where the agricultural research outputs are under-utilized by extension workers in the North-west, Nigeria and this limits their ability to provide current and relevant information to farmers to overcome their all-time agricultural challenges. As such the study set use only one the level of information skills on the use of agricultural research outputs by extension workers in the

study area and is guided Guided by the two theoretical assumptions of Leckie et. al. (1996) Information Seeking Professional Model.

Research Objectives

The study is set to:

1. Identify information skills used in using agricultural research outputs by extension workers for dissemination of information to farmers in North-West, Nigeria.
2. Find out the different types of agricultural research outputs used by extension workers for the dissemination of information to farmers in the study area.

Literature Review

Research agriculture is an ongoing exercise as it requires periodic updates as a means of making agriculture as productive as possible. The need for continuing research is brought about by the changing climatic conditions, new technology, innovations in improved seeds, new methods of combating pests and diseases, and the management and marketing strategies used in agriculture. Researchers are usually interested in investigating new trends and building on existing ones, which means that repetitions and duplication are not desirable. Therefore, guides to sources of agricultural information are useful in allowing researchers to know what is already available and what additions or improvements are required (Pratiwi & Suzuki, 2017).

Many scholars have categorized the different types of agricultural research outputs. For example, Iro (2016) has identified two different types of agricultural research outputs which include print agricultural research outputs and electronic agricultural research outputs. According to the author, printed agricultural research outputs are the information sources that are in printed formats such as technical reports, books, journal articles, conference papers, thesis, and dissertations while electronic agricultural research outputs are those information sources that are in electronic formats such as online weather forecast, online journals, online databases, and e-books.

According to Mamman (2023), information skills in the use of agricultural research outputs incorporate navigation skills, selection and evaluation skills as well as the ability to use information. These skills enable agricultural information providers like extension workers to handle the changing contents of using agricultural information and to easily identify the needed information, access, evaluate and disseminate the current and relevant agricultural information to farmers, to solve their problems and improve their farming practices. Studies like Pratiwi and Suzuki (2017); Abubakar et. al. (2019) found that due to poor searching skills affected the use of agricultural research outputs especially online. The use of agricultural research outputs in the 21st century is not a choice but rather inevitable in the dissemination of current and relevant information to farmers (Mamman, 2023). A study by Gulati, Sharma, Samantara and Terway (2018) in India revealed that extension workers 76% from different geographical boundaries used agricultural databases daily, while 62% of the respondents used agricultural journal articles and technical reports. The study also indicated high agricultural productivity because of providing current information to farmers in due time. A study carried out in Nigeria by Etim, Aboh, Idiku, and Okoi (2021) on the assessment of the level of occupational safety awareness for agricultural extension agents found that the majority of the extension workers have not fully utilized various agricultural research outputs as many of them use traditional method in searching the agricultural resources. They prepare to source information from interpersonal sources.

Theoretical Framework of the Study

Theoretical framework is a structure that outlines and explains the theoretical concepts, ideas, and principles that are used to guide research. It provides a lens through which researchers interpret their data and understand the phenomena they are studying (Ibrahim, 2017). It guides the research process by providing a theoretical perspective for interpreting the data. It is constructed based on existing theories or models that have been developed and tested by researchers in the past. In this study, the Information seeking professional model has been chosen to underpin the current study. The model is adequate and suitable for addressing the research objectives of the current study. The information-seeking professional model by Leckie et al. (1996) is based on the assumption that information-seeking is related to the enactment of a particular role and its associated task. As part of the communication and information-seeking process, professional groups, such as doctors, librarians, lawyers, and engineers adopt, enact, and expect various roles. Particular roles and their related tasks result in information needs, which are, in turn, affected by factors, such as sources available, awareness, skills and intended use of sources, individual characteristics of the user, and environment surrounding the user (Devadson & Lingam, 1997). For example, professional engineers carry out many tasks, such as design, development, documentation, and implementation. These tasks, whether technical or non-technical, require specific information. Information sources deal with print and electronic information sources like textbooks, manuals, databases by others, and skills like the ability to locate where the information is in time. The model is in Figure 1 below

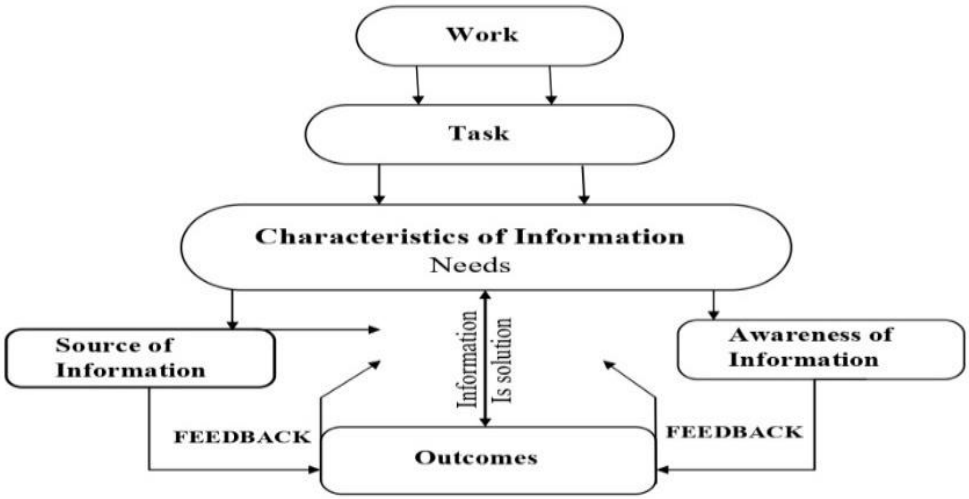

Figure 1: (Leckie's Model of Information Seeking of Professionals, 1996)

Although the model was developed to take care of the information needs of professionals like engineers, doctors, and lawyers, for instance, it is not directly applicable to agriculture. Nevertheless, it is a useful aid for this study, because the outcomes of information seeking rely on the sources of information available, skills as well as awareness of those sources (agricultural research outputs). The information-seeking professional model can play a significant role in information skills and the use of agricultural research outputs by extension workers which in turn can help them to disseminate current and relevant information to farmers.

Research Method and Design

The study adopted a descriptive survey research design and the population of the study comprises all the extension workers working at the state government level of seven (7) sates which includes Jigawa, Kaduna, Katsina, Kano, Kebbi, Sokoto and Zamfara and Multistage cluster sampling technique was adopted for the study. Cluster sampling was used to select the sample of 234 from the two sampled states using the guiding principle of Research Advisor's Table 2006. Questionnaire was used for data collection and the data collected was analysed and presented in mean and standard deviation using SPSS version23 at the 3.0 bench mark. You don't need to explain everything in detail here since it is no a thesis

Data Analysis

Response Rate from the Questionnaires Administered to Respondents of the Study

A total of 234 questionnaires were distributed to the respondents under study, and 183 questionnaires were duly filled in and returned as shown in Table 1.

Table 1: Information Skills of Extension Workers (N=183)

S/n	Items	Mean	STD
1	I have enough information skills in utilizing all the printed agricultural research outputs	3.99	1.01
2	I have the internet searching skills	2.63	1.22
3	I can make literature searching	2.63	1.23
4	I have skills in bibliographic database searching	2.56	1.36
5	I can refine or filter the search result from the internet	2.71	1.55
6	I possess information skills in using all the online agricultural research outputs	2.65	1.43
7	I have skills in using different information technologies to use agricultural research outputs	2.76	1.34

STD= Standard deviation

The results from the Table 2 indicates that respondents generally feel confident about their information skills in utilizing printed agricultural research outputs, as evidenced by the high mean score of 3.99 and a relatively low standard deviation of 1.01. This indicates agreement among the respondents that they possess sufficient skills in using printed resources, with minimal variation in responses. However, when it comes to utilizing digital resources, the mean scores for internet searching skills (2.63), literature searching (2.63), bibliographic database searching (2.56), refining internet search results (2.71), and using online agricultural research outputs (2.65) fall below the midpoint of 3.0. These values indicate general disagreement among respondents about their ability to navigate and use digital information sources effectively. The higher standard deviations for these items, particularly for refining internet search results (1.55) and using online agricultural research outputs (1.43), show a wider range of responses, suggesting variability in respondents' confidence or skill levels in these areas.

The findings have significant implications for extension workers, especially in the 21st century where the dissemination of agricultural information increasingly relies on digital platforms. With low mean scores and high standard deviations in digital competencies, it is clear that there is a gap in digital literacy among agricultural professionals, which could hinder the effective transfer of relevant, up-to-date information to farmers. Extension workers need to be well-versed in online

search techniques, databases, and digital information technologies to efficiently access and deliver research outputs.

Table 3: Use of Agricultural Research Outputs for Information Dissemination to Farmers by Extension workers (N=183)

S/n	Items	Mean	STD
1	I am using agricultural databases for information dissemination to farmers	2.13	1.20
2	I am using journal articles for information dissemination to farmers	3.41	1.72
3	I am using online journal articles for information dissemination to farmers	2.37	1.32
4	I am always using Newspapers for information dissemination to farmers	3.51	1.63
5	I am always using online Newspapers for information dissemination to farmers	2.13	1.20
6	I am using agricultural conference proceedings for information dissemination to farmers	2.09	1.14
7	I am using online agricultural conference proceedings for information dissemination to farmers	2.16	1.25
8	I am using students' projects, theses & dissertations for information dissemination to farmers	3.65	1.51
9	I am using online students' projects, theses & dissertations for information dissemination to farmers	2.51	1.46
10	I am using agricultural books for information dissemination to farmers	3.64	1.44
11	I am using online agricultural books for information dissemination to farmers	2.45	1.37
12	I am using technical reports, especially on weather forecasts for information dissemination to farmers	2.55	1.39
13	I am using online technical reports, especially on weather forecasts for information dissemination to farmers	2.45	1.35

The results from the Table 3 shows that respondents more frequently rely on traditional print resources for disseminating information to farmers. For example, high mean scores for the use of journal articles (3.41), newspapers (3.51), students' projects, theses, and dissertations (3.65), and agricultural books (3.64) indicate a general agreement that these printed materials are widely used. The relatively high standard deviations for these items, especially for journal articles (1.72) and newspapers (1.63), suggest variability in the extent to which different respondents rely on these sources. In contrast, the low mean scores for using online resources such as online journal articles (2.37), online newspapers (2.13), and online agricultural databases (2.13) indicate that respondents generally do not use digital platforms as often for information dissemination. The high standard deviations for these digital sources show considerable differences in digital adoption among respondents.

These findings highlight a significant challenge for extension workers in the digital age. While traditional print materials remain a key tool for information dissemination, the underutilization of online resources suggests that extension workers may not be fully leveraging the breadth of information available through digital channels. This could limit the ability of farmers to access real-time updates, especially regarding critical issues like weather forecasts, where online technical reports and databases could provide timely and relevant data.

Discussion of Findings

1. Identify information skills used in using agricultural research outputs by extension workers for dissemination of information to farmers in North-West, Nigeria. The finding revealed that most of the extension workers possess the skills of using printed agricultural research outputs and only few has the skills of using some of the online agricultural research outputs in the area. In the congruencies of the findings of the study, Adam et. al. (2019) in Mexico; Dhehibi, Rudiger, Hloniphani, and Zied-Dhraief (2020) in Tunisia found that different agricultural research outputs exist and are published all the time but indicate a lack enough digital skills by extension agents in using all the types of agricultural research outputs. Though, there is variation between the two countries, in terms of skills using agricultural research outputs. In Mexico, agricultural research outputs like online journal articles, online newspapers, online books, and online technical reports were moderately used while low use of such documents is found in Tunisia
2. Find out the different types of agricultural research outputs used by extension workers for the dissemination of information to farmers in the study area. The findings indicate that extension workers predominantly use traditional print materials, such as journal articles and newspapers, for disseminating information to farmers, while the use of online resources is significantly lower. This reliance on print suggests some variability in their employment of these outputs and limited use of online agricultural research outputs that are being used by extension workers. In agreement of the findings of this study, Adeleke and Nwalo (2017) at Ibadan and Mburu (2019) in Nigeria found that electronic information resources are not been used by the majority of the respondents. However contrary to the findings of the study by Gulati et. al. (2018) in India revealed that extension workers 76% from different geographical boundaries used agricultural databases daily, while 62% of the respondents used agricultural journal articles and technical reports.

Conclusion

In conclusion, the findings reveal a significant reliance on traditional print materials for disseminating agricultural information to farmers, while the use of digital resources remains limited. The low utilization of online databases, journal articles, and technical reports suggests a gap in digital literacy among extension workers, which could hinder the timely delivery of essential information, particularly in the fast-evolving agricultural sector. To enhance the effectiveness of information dissemination in the 21st century, there is a clear need for capacity-building initiatives that focus on improving digital skills and promoting the use of online resources among extension workers.

Recommendations

1. There is a need to enhance digital literacy and training for extension workers, thereby, organizing training programs aimed at improving digital skills, including the use of online

databases, search engines, and digital platforms for agricultural research. This will empower extension workers to efficiently access and disseminate current and information to farmers.
2. There is a need to promote the use of digital platforms for real-time information sharing, this is done by encouraging extension workers. This will help ensure that farmers receive timely, actionable information, particularly in critical areas such as climate change and crop management.

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