

**Information Dissemination Strategies in Agricultural Extension
Research of Nigerian Stored Products Research Institute during
COVID-19**

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Abstract

The global pandemic caused by the novel coronavirus (COVID-19) has drastically altered the world as we know it. This has been especially felt in the agricultural sector, where farmers and food producers have been hit hard by the pandemic. In Nigeria, the Nigerian Stored Products Research Institute (NSPRI) was tasked with helping farmers combat the impacts arising from the pandemic. This paper seeks to evaluate the information dissemination strategies employed by the NSPRI in agricultural extension research during the Covid-19 pandemic. The research used a qualitative case study design to examine the NSPRI's information dissemination strategies. Semi-structured interviews were conducted with six key informants from the NSPRI. Themes were identified by manual coding and data was analyzed using descriptive statistics. The findings indicate that the NSPRI used a variety of strategies to disseminate information to farmers during the pandemic. The most employed strategies were radio broadcasts and awareness campaigns, followed by text messaging and in-person visits. Additionally, the NSPRI utilized social media platforms such as Twitter, Facebook, and WhatsApp to reach out to farmers. The study concluded that the information dissemination strategies employed by the NSPRI during COVID-19 were effective in reaching out to farmers

and disseminating valuable information. However, the impact of these strategies was not uniform across the country, as access to technology and digital literacy varied greatly from region to region. The study recommends further research to measure the effectiveness of the strategies adopted by NSPRI more precisely, as well as the use of more innovative approaches to enhance the effectiveness of information dissemination.

Keywords: Information Dissemination Strategies, Agricultural Research Outreach Centre, Coronavirus, Agricultural Extension Research, Diffusion of Innovation

Introduction

Information has been conceived as an important variable in various aspects of human existence; especially, in education, social, economic, political and medical (Mohammed et al., 2015). To disseminate information effectively, it is important to consider what message to convey, why is it necessary to convey such a message, who are the audience and what best strategy to employ in conveying such messages – traditional or social media. (Steven & Fried, 2004). Information dissemination strategies in the context of this study, therefore, refer to the different means of transmitting or sharing information by agricultural extension researchers to the public. Gonzalez et al. (2016) explained that dissemination and communication of research are useful for increasing the visibility of research outputs, the involvement of the public science and innovation and promoting the confidence of the society in science. Dissemination of information by extension research officers is highly essential in agricultural institutions like NSPRI. It is the height of all extension research activities. This aspect of research had its share of the global devastating effects of the COVID-19 pandemic. Extant studies on information dissemination strategies during COVID-19 have explored various aspects such as the health sector, politics and governance, library, and academic institutions, but

public agricultural research institutions like NSPRI are scarcely explored. This study, therefore, explores information dissemination strategies in agricultural extension research in NSPRI during Covid-19.

Statement of the Problem

Sharing of new knowledge gained through agricultural research is essential to the ethical conduct of research. When research is carried out on food preservation and safety, dissemination of research findings is of utmost priority; this is because of the importance of such research findings to stakeholders in the agricultural sector like farmers, food processors and the nation at large. The research activities of the agricultural research institutes cannot be completed until the research findings are disseminated to stakeholders and are subsequently adopted. The COVID-19 pandemic surge and its related complications impair activities across the globe. Movements were restricted while certain categories of government staff were requested to work from home. Effective conduct of research and dissemination of research findings cannot be affected by this development. It is based on this backdrop that this study investigates information dissemination strategies in Nigerian Stored Products Research Institute during COVID-19.

Aim and Objectives

The study aims to examine information dissemination strategies employed by extension officers in Nigerian Stored Products Research Institute during COVID-19. The specific objectives are to:

- i. examine and discuss the strategies employed in disseminating information to farmers or food processors by extension officers in Nigerian Stored Products Research Institute before the COVID-19 pandemic outbreak;
- ii. examine and discuss the strategies of disseminating information to farmers and food processors by extension

- officers in the Nigerian Stored Products Research Institute during the outbreak of the COVID-19 pandemic; and
- iii. examine and discuss the ways by which extension officers in Nigerian Stored Products Research Institute utilise the various information dissemination strategies to disseminate research findings to farmers and food processors during COVID-19.

Literature Review

Gonzalez et al (2016) emphasized the need to consider the dissemination and communication of research as very important in a research project. They explained that the two are useful for increasing research output's visibility, and involvement of the public in science and innovation as well as promoting society's confidence in research. The study further submits that dissemination and communication are important in ensuring that conducted research impacts society socially, economically and politically. The reviewed and current study share similarities by focusing on information dissemination of research activities. However, while the reviewed study explores research generally, the current study focuses dissemination of research findings by agricultural extension officers in the Nigerian Stored Products Research Institute (NSPRI).

In the study on information dissemination strategies among migrant workers, Mohammad et al (2015) examine the quest for information by migrant workers in Malaysia and develop information strategies among them. The study explores details of the attitudes of migrants from Indonesia, Thailand, and the Philippines among others. The study develops a conceptual framework of information dissemination strategies of the migrants based on extensive literature and related studies, providing a new model approach to information dissemination among migrant workers thereby enabling them to identify their information needs and sources. The reviewed study targets migrant workers in some countries outside Nigeria, while the current study

adopts the focus group discussion (FGD) method to explore information dissemination strategies by agricultural extension officers in Nigerian Stored Products Research Institute (NSPRI).

In another study on the effect of digital technology and the web on academia, Rosa & Guliana (2021) expose the interrelationship between new digital platforms for creating knowledge and dissemination and their use within discourse communities to shape and reshape existing academic discourse. Rosa & Guliana (2021) investigate some existing academic discursive practices and their specific textual identities in the form of digitally mediated genres to reveal the complexities of the study of digital academic communication. The reviewed study, though belongs to the information dissemination discourse like the current study, focuses on the effects of digitalized academic discourse on language, genre and identity. The current study in contrast concentrates on information dissemination by agricultural extension officers in NSPRI during COVID-19. The reviewed study fails to adopt any theoretical framework, which is an area where the reviewed study is variant to the current study which adopts innovation diffusion theory as its theoretical framework.

Peter (2019) explores the relationship between good governance, information dissemination and national development in the Nigerian context. The study relies on descriptive methods of relevant literature and empirical facts to enumerate certain inextricable indices of good governance in Nigeria and relates it to information dissemination via the library to deliver national development. It presents evidence across the globe on the connection between the three variables investigated. It shows that Nigeria has not complied with the inextricable indices of good governance because of a lack of committed leaders. Peter (2019) therefore recommends a better and genuine commitment of leaders towards policy implementation and exhibit readiness to deliver good governance and ensure the sanctity of governance through adequate flow of information between the governor and the governed. The

library, if adequately invested in it, could effectively play its role in enhancing national development.

Both the reviewed and current studies fall within the information dissemination discourse. However, the reviewed study adopts the descriptive method of relevant literature and empirical facts to enumerate indices of good governance while the current study adopts FGD to identify the strategies employed by agricultural extension officers in NSPRI to disseminate information during COVID-19. Wankasi, et al (2020) examine the inequality that exists between children in public and private schools in respect of health care in rural Nigeria. This is premised on ineffective dissemination and implementation of the policy on school health in public schools. The study, therefore, develops a conceptual framework for effective dissemination and implementation of a policy on school health in rural Nigeria. It employs an exploratory descriptive and contextual research design to develop the framework. The study concludes that the framework would be a firm foundation and contribution to improve the health of the children in public schools and as well improve academic performance that would positively impact future endeavours.

Although the reviewed and current studies focus dissemination of information, disparities exist, however, in the selection of the case studies and methodologies. While the reviewed study has public and private schools as its case study, the current study adopts NSPRI as a case study. The reviewed study explores a conceptual framework for information dissemination while the current study explores the strategies of dissemination information by agricultural extension officers in NSPRI during COVID-19.

Studies have established the impact of COVID-19 on different sectors globally. For instance, Schleicher (2020) studied the impact of COVID-19 on education. According to the study, COVID-19 took its turn on conventional schooling as manifested in the nationwide closure

of schools. Students rely more on learning through the Internet, television and radio. The study also pointed to the possible consequences of the crisis on the education budgets more quickly as public revenues decline sharply and government review the prioritisation of education in the national budget. The study presents the pandemic as a call to renew the commitment to the Sustainable Development Goals. Ensuring that all young people can succeed at school and develop the knowledge, skills, attitudes and values that will allow them to contribute to society is at the heart of the global agenda and education's promise to our future society (Schleicher, 2020). The reviewed study is relevant to this current study in that both explore the Covid-19 period. However, the divergence exists in that the reviewed study focuses on education while the current study focuses on information dissemination by extension officers in Nigerian Stored Products Research Institute. Also, the reviewed study does not carry out any investigation, while the current study carried out an investigation using a focus group study.

The Theoretical Framework

Diffusion of Innovation (DOI) theory was developed by Everett Rogers (1931-2004) a professor of communication studies in 1962 (Rogers, 2003). The theory is a perspective of social change theory and was the pre-eminent model of the adoption of innovations in agriculture in the 1960s (Rogers, 1995). Diffusion of innovation theory describes the process in which innovation is communicated through selected channels over time among members within a given society (Bauman, 2003). DOI theory stresses the component of communication and peer networking within the adoption process. According to Rogers (2003), diffusion is a social type of communication process in which the message transmitted is designed to convey a new idea, reduce uncertainty, provide information and promote social change.

Diffusion of Innovation theory explains how an idea or product gains momentum and spread through a specific population or social system. Gary (2017) conceives it as the process through which new ideas, technologies, products or processes are spread through communication among members of a social system via communication channels over time. It is a social process that occurs among people in response to learning about innovation. Diffusion of innovation communication theory is adopted for this study because it is a specialised form of communication that focuses on disseminating information about new ideas, products, technologies, services, or regulations which is the focus of this study. It is an important form of communication that promotes social progress in the evolution and adoption of important new ideas to address social issues (Gary, 2017). The result is that people as part of a social system, adopt a new idea, behaviour, product, etc. Adoption means that a person does something different than what they had previously done.

Information Dissemination in Nigerian Stored Products Research Institute (NSPRI)

Nigeria Stored Products Research Institute (NSPRI) is one of the research Institutes under the Federal Ministry of Agriculture and Rural Development (FMARD). It is also supervised by the Agricultural Research Council of Nigeria (ARCN). Established in 1948 with the headquarters located in Ilorin, Kwara State, the institute has zonal offices and outstations located in Lagos, Ibadan, Kano, Port-Harcourt, Sapele and Maiduguri to cover the six geo-political zones of the nation. The national mandate of the institute is to conduct research into the postharvest management of crops, handling practices, product development, and processes for safe storage. It also researches durable crops like cereals and legumes, oil seeds and beverages. Also, it is also involved in the development of processing protocol and packaging of processed products. This is inclusive of fabrications, food processing and packaging.

NSPRI research activities include extension services which involve dissemination of research outputs and viability of research outcomes. These consist of field and community services, agricultural economics and marketing, extension, training activities and publications. The cycle of research activities is not complete until the result is disseminated to end users and stakeholders like farmers, rural and market women, ADPS, and government officials in the agricultural sector by the extension officers. This is why information dissemination is peculiar to NSPRI. Useful and practical information is diffused to end users who are also encouraged to use such information to improve their economic livelihood. The philosophy is to help people so that they can help themselves.

The extension activities in Nigerian Stored Products Research Institute are the dissemination of information on research findings and innovations from the institute to the end users through visual, verbal or written strategies. There could also be media, mass or group contact. The process is not complete until there is the feedback from target group which reflects in the level of adoption and usage of innovation disseminated. Hence, the conventional communication process adequately fits into the process of information dissemination of research innovations and findings by extension officers in NSPRI. The element of communication includes the sender (source), the message, channels of communication, the receiver (end users) and the response from the end users (feedback).

Methodology

This study was conducted in the Research Outreach Department of the institute's headquarters in Ilorin, Kwara State, using the focus group discussion method to get the information needed for this research. The researcher purposively selected six extension officers of the Nigerian Stored Product Research Institute: they were a Chief Research Officer, a Principal Research Officer, 2 Senior Research Officers and a

Research Officer I. They were the categories of officers permitted to be physically present in the office, as the essential staff needed for the national survey on the effects of COVID-19 and for other ongoing research works which fall within their schedule in the institute. Four relevant questions were designed to be able to elicit information from discussants. A total period of one hour and thirty minutes (1hr. 30mins) was spent during FGD which was recorded via an android phone and was later transferred to print and analysed using thematic analysis. The focus group discussion was able to resolve all the research questions.

Results and Discussion of Findings

The Strategies Adopted for Pre-COVID-19 Pandemic Information Dissemination in Nigerian Stored Products Research Institute (NSPRI)

Information dissemination of research output is the peak of research activities in national agricultural institutions. When dissemination of research innovation is lacking, the research could be considered a waste. Extension officers of Nigerian Stored Products Research Institute are responsible for the dissemination of research innovations which are mainly targeted towards agricultural postharvest loss prevention to farmers and food processors. The identified strategies for dissemination employed by the extension officers include:

i. Establishment of Agricultural Research Outreach Centers (AROC)

AROC are adopted villages and schools where NSPRI technologies on food safety, preservation and processing were constructed and demonstrated for end users to see, to be trained on the usage and to adopt. The strategy affords the extension officers to disseminate information on research innovations through training and demonstration of the use of NSPRI technologies to the pupils, the farmers, the settlers and other stakeholders who are close to the AROC concerning the uses of such technologies. The strategy enables research

inventions and innovations to be opened to society as well as encourages the pupils to develop an interest in agriculture.

ii. Seminars, Workshops and Training Organised by NSPRI

There is always mass attendance and participation of farmers, Agricultural Development Project (ADP) officials and other stakeholders in seminars, workshops and training which are sometimes co-sponsored by the institute and some NGOs, International Organizations and other Government agencies where NSPRI technologies on food safety, preservation and processing are exhibited.

iii. Workshops and Conferences by other Agriculturally-Based Research Institutes

NSPRI participates in other workshops and conferences organised by different agriculturally based research institutes, institutions and similar organisations where innovations are exhibited for the benefit of the stakeholders and the society at large.

iv. Liaising with Market Women

Extension Officers visit market centres to liaise with the market women to exhibit and introduce them to NSPRI technologies. Extension officers visit marketplaces to introduce NSPRI technologies like plastic crates which are technologies used to transport tomatoes from the farm to the market to reduce postharvest loss and fish smoking kiln which is a modern technology used for smoking fish as against the primitive method.

v. Student Excursions

Students embark on excursions to the institute on regular bases. Students from different schools ranging from primary to tertiary level visit and are received in NSPRI premises from time to time. They are always conducted around the institute's technologies by experts who provide them with first-hand information on the technological innovations and functions of each of the technologies.

Other strategies employed include:

- vi. Radio advertisements/jingles and Television programmes
- vii. Research publications through journals and conferences. Papers are written by research officers for publication in renowned journals.

Strategies adopted for Information Dissemination in Nigerian Stored Products Research Institute (NSPRI) during COVID-19.

COVID-19 is an acute respiratory infectious disease that broke out in Wuhan, China in early December 2019. The virus spread across many boundaries; the first reported case of the virus in Nigeria was on 28th February, 2020. However, given the fast-spreading nature of the virus, the entire nation was locked down in March, 2020. This development affected the extension officers of the Nigerian Stored Products Research Institute (NSPRI) from adequate dissemination of research innovations. They must devise other means of disseminating information to the end users.

a. The Media

Television, Radio jingles and programmes across the country (adverts and articles were sent to the media with the video of practical sessions. Adverts and research articles were published in the Newspapers) because of the lockdown imposed by the government at the peak of the Covid-19 pandemic, NSPRI extension researchers were unable to go out, NSPRI, therefore, intensified on Radio jingles, advertisements and Television programmes to replace the traditional direct contact and adverts in the Newspapers.

b. Online/Internet

Various internet sources were explored to air scholarly virtual meetings, seminars, conferences and training. For instance, because direct contact with people was not possible, NSPRI resulted in the use of WhatsApp, Zoom, and other online sources to hold meetings,

conferences and seminars. this enables mass participation of stakeholders from their comfort zones without direct contact with the public. There was a virtual launch of the Institute's technologies via Zoom. e.g., the launch of NSPRI's metal drums, Fish Smoking Kiln together with Ice Fish Box which were distributed to participants across the country through NSPRI Zonal offices across the nation.

c. Research Publications in Journals and Conference Proceedings.

NSPRI emphasized publications of research innovations in journals, periodicals, conference proceedings and newsletters which were responded to adequately as monthly publications of research papers written individually and jointly for publications across the globe.

d. Training of Farmers, Other Stakeholders and Students on Excursions to the Institute

The partial relaxation of the lockdown witnessed a drastic reduction in the number of visitors to be allowed in the institute for training and excursions. For instance, a reduction in the number of students allowed for excursions; from about 400 students per time to 30 students per day.

e. Training and Re-training of ADP Representatives, and a few Corps Members, Spread Across Each State of the Federation.

Reduced the number of extension researchers assigned to different locations across the nation to train very few stakeholders and NYSC Corps members.

f. Agricultural Research Outreach Center (AROC).

The partial relaxation of the lockdown also witnessed a reduction in the number of participants at AROC from 40 participants to 12 participants to enable them spread out to avoid the Covid-19 spread.

Merits of the Strategies of Information Dissemination of Research Innovations by Extension Researchers in NSPRI During COVID-19

- a) It is cost economical, some of the strategies adopted during COVID-19 were able to cut down costs. The cost of transporting extension research officers and materials to designated AROC, workshop, training, seminar, conference and market centres were reduced. Extension officers who spent days at some of these centres would also be paid allowances.
- b) It prevents the risk involved in travelling. Extension researchers could not travel at the peak of COVID-19 hence preventing their exposure to the risk of travelling.
- c) It prevents conflicts of interest during physical discussions. Divergence in the response from stakeholders at direct contact centres sometimes generates a conflict of interest among participants making it difficult for decisions to be easily taken.
- d) It covers a wider audience, especially the mass media. Information on research innovations from NSPRI could reach more participants across the globe as against the direct contact that was limited to the designated centres.

Demerits of the Strategies Employed in Disseminating Research Innovations by Extension Officer in NSPRI during COVID-19.

- a) Difficulty in reaching out to the illiterates in society and rural farmers. Some of the farmers and market women in the rural areas could not be reached during Covid-19 because of their level of literacy and lack of infrastructural amenities like electricity and access to internet and media facilities. For instance, 19 farm markets were covered in 2019 – 2020 before the COVID– 19, this was no longer possible during COVID-19.
- b) High cost of media advertisements. Radio and television jingles as well as advertisement and other newspaper articles are quite costly.

- c) Drastic reduction in the number of students allowed for excursions, drastic reduction in the number of participants at AROC, seminars, conferences, and workshops during the partial lockdown.
- d) Loss of information during partial lockdown during direct beneficiaries transferring information to non-direct beneficiaries of training.
- e) Difficultly convincing people just by hearing on the air.
- f) Delayed responses and feedback during COVID-19as against immediate feedback and responses through the traditional strategy of direct contact.
- g) Inability to identify those that are sincerely interested or need specific technologies, unlike direct contact when extension officers identify the sincerity of clientele through body language and facial expressions.

Findings revealed that pre-COVID-19 period in NSPRI, dissemination of research innovations employed the traditional, individual (person-to-person) contact and mass contact strategies. Findings show that strategies i-v before COVID-19 were more popularly practised than strategies vi-vii. This implies that the strategies of disseminating information about the Institute's research innovations by extension officers before Covid-19 were more of direct contact with the end users/stakeholders than media and Online/Internet strategies. The strategies are more effective, persuasive and less expensive. Through one on one/person-to-person contact, the facial expression of the receiver, the body language and the nature of questions guide the extension officers to determine the success or otherwise of the information disseminated. Extension officers can conduct needs assessment surveys to know the needs of the communities or clientele while impact assessment is also conducted to assess the impact of the research output on end users. Hence, schools and villages are adopted as demonstration and evaluation centres for research innovations.

Demerits of the Strategies of Information Dissemination of Research Innovations by Extension Researchers in NSPRI Before COVID-19

- a) It is costly, some of the strategies adopted before COVID-19 were expensive. The cost of transporting extension research officers and materials to designated AROC, workshop, training, seminar, conference and market centres were high. Extension officers who spent days at some of these centres would also be paid some allowances.
- b) It exposes extension officers to the risk involved in travelling. Extension researchers travel to different locations before COVID-19 hence exposing them to the risk involved in travelling.
- c) It encourages conflicts of interest during physical discussion. Divergence in the response from stakeholders at direct contact centres sometimes generates a conflict of interest of participants making it difficult for decisions to be easily taken.
- d) It has a limited audience, especially unlike the mass media. Information on research innovations from NSPRI could not reach participants across the globe. The direct contact was limited to designated centres.

Merits of the Strategies Employed in Disseminating Research Innovations by Extension Officer in NSPRI before COVID-19.

- a) The illiterates in the society and rural farmers could easily be reached. Some of the farmers and market women in the rural areas could be reached before COVID-19 because the extension officers were able to travel to the rural areas to meet with the farmers and market men and women. For instance, 19 rural markets were covered in 2019 – 2020 before the COVID– 19. This would not have been possible during the COVID-19.

- b) High cost of media advertisements like Radio and Television jingles as well as advertisements and other newspaper articles which were the focus during COVID-19 were reduced.
- c) Increased the number of students that participated in excursions and increased the number of participants at AROC, seminars, conferences, and workshops.
- d) Beneficiaries could be reached directly by the extension officers, hence there is no need for an intermediary in transferring information to non-direct beneficiaries of training.
- e) Participants could be easily convinced through direct contact.
- f) Quick responses and feedback were possible before COVID-19 as against delayed feedback and responses during COVID-19.
- g) Extension officers could easily identify those that are sincerely interested or that need specific technologies through eye contact and body language unlike through media when extension officers could not easily identify sincere clientele through body language and facial expressions because there was no direct contact.

Findings revealed that pre-COVID-19 period in NSPRI, dissemination of research innovations employed the traditional, individual (person-to-person) contact and mass contact strategies. Findings show that strategies i-v before COVID-19 were more popularly practised than strategies vi-vii. This implies that the strategies of disseminating information about the Institute's research innovations by extension officers before Covid-19 were more of direct contact with the end users/stakeholders than media and Online/Internet strategies. The strategies are more effective, persuasive and less expensive. Through one on one/person-to-person contact, the facial expression of the receiver, the body language and the nature of questions guide the extension officers to determine the success or otherwise of the information disseminated. Extension officers can conduct needs assessment surveys to know the needs of the communities or clientele

while impact assessment is also conducted to assess the impact of the research output on end users. Hence, schools and villages are adopted as demonstration and evaluation centres for research innovations.

Conclusion

The study attempted information dissemination strategies by extension officers in NSPRI during COVID-19. This was investigated using the Diffusion of Innovation theory (DOI) to explore strategies employed by extension researchers to disseminate information on research innovations during COVID-19. Diffusion innovation theory focused on how innovations are communicated through selected channels in a social context. One can conclude from the study that information dissemination strategies of extension research during COVID-19 did not follow the traditional direct contact, rather, the study reveals that non-conventional strategies like the use of media (television, radio, jingles, virtual conferences, seminars and training and virtual launch of technologies), newspaper advertisement, publication of extension research through journals, press coverage/conference and online/internet based training and activities conducted for representatives of NYSC corps members, representatives of ADP staff, and representatives of other stakeholders, coupled with reduced participants during the partial lockdown. Even though both traditional strategy and media-based strategy were employed by extension officers to disseminate information in NSPRI before COVID-19, findings show that the traditional direct contact was more practised and gained popularity, it is also the most preferred strategy by both NSPRI and the stakeholders. The study reveals that the COVID-19 strategies were economical, prevents risks of travelling, prevents conflicts of interest, and enhances wider audience participation among others. This is not to say that the strategy was not with its shortcomings, for instance, there was delayed feedback, difficulty in reaching out to the illiterates in the society and rural farmers, loss of information during direct beneficiaries transferring information to non-direct beneficiaries

inform of during partial lockdown and reduction of participants at AROC among others.

Recommendations

It is recommended that there should be increased media and online-based strategies for information dissemination. Informative video clips should be posted on websites and other internet-based communication channels that could be accessed by a larger audience. Also, seminars and conferences should be translated into the major Nigerian languages on air and in print so that educationally disadvantaged audiences, rural settlers and rural farmers can be carried along and participate in the extension research activities via media accordingly. There should be strong support from the government in terms of the provision of adequate funding for research activities, and the provision of infrastructural facilities in the rural areas to enable access to internet-based information. There should be the increased establishment of AROC in remote areas while Government should embark on massive rural electrification to aid media programmes in rural areas.

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