



Perceived Influence of Communication Strategies on Agricultural Technologies Utilization among Farmers in Nigeria: A Study of NIHORT Adopted Village and School

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Abstract. This paper examined perceived influence of National Horticultural Research Institute's (NIHORT) communication strategies on agricultural technologies utilization among adopted village commercial farmers in Awaye community, Egbeda local government area, and student farmers in Oba Abass Aleshinloye Grammar School, Eleyele in Ibadan North West Local Government Area Ibadan, Oyo state, Nigeria. A total enumeration sampling procedure was used to obtain a sample size of 51 commercial farmers and student farmers altogether. Structured questionnaire was administered to assess their exposure and perceptions of the communication strategies implemented by NIHORT and analyzed using descriptive and inferential deductions. The results indicated that the communication strategies deployed by NIHORT had a positive influence on the farmers' utilization of agricultural technologies. Specifically, the majority of the farmers ($\bar{X}=3.12$) indicated that they had developed a greater trust in NIHORT's communication strategies and the agricultural information disseminated through them, which encouraged the adoption of fertilizer application technology introduced with resultant effect in farm production increase. Furthermore, majority (52%) of the farmers have access to the agricultural messages disseminated through NIHORT. However, the farmers' extent of exposure to and perception of the communication strategies deployed by NIHORT has no significant influence on the level of utilization of the agricultural technologies ($p=0.579$). The study recommended the integration of farmers' needs into communication framework by agricultural research institutes to provide agricultural technologies' utilization within farming communities to enhance sustainable agricultural productivity in Nigeria.

Keywords: Adopted school, adopted village, agricultural technologies, communication strategies, farmers, NIHORT, utilization

1. Introduction

The ultimate objective of agricultural technology is to be embraced and utilized by clients to the fullest extent over an extended period. This requires a methodical approach that involves identifying a specific need, exploring available options, testing potential solutions, and ultimately deciding whether to implement the technology (Ifeanyieze et al., 2017; Lambert & Ozioma, 2011). Utilization is the act or instance of applying agricultural technology or innovation in a practical or lucrative manner (Uwandu et al., 2018). Perceptions of affordability and service quality can impact utilization, with factors such as politeness and perceived competence influencing judgment. Satisfaction with innovation and extension agents' attitudes can also influence their future use (Onyeneho et al., 2016).

Communication is crucial for improving farming techniques and increasing agricultural production (Onagwa, 2016). This is key to economic growth and the utilization of agricultural technology. Diverse strategies for all users can increase production, develop skills, and meet the market needs. Trustworthy information sources also benefit the soil and contribute to economic growth (Adeyemo, 2020; Ogunremi, 2013). To improve agricultural technologies' utilization, effective communication and collaboration are essential for identifying research problems, adapting recommendations to local conditions, and improving agricultural technology (Voh, 2017). Researchers, extension workers, and

farmers need to work together in a collaborative effort called "linkage". This involves sharing information and feedback to increase productivity (Chuluunbaatar, 2011; Ifeanyieze et al., 2017).

A functional and robust agricultural research system is necessary for sustainable growth. Governmental and non-governmental research institutions conduct studies and develop technologies to improve farm integration. These organizations create and distribute innovations to improve output, information, and food security (Bitagi & Ozioko, 2015; Ifeanyieze et al., 2017; Joans, 2013; Ojesanmi et al., 2014). The National Agricultural Research Institutes (NARIs) in Nigeria which National Horticultural Research Institute (NIHORT) is one of them have been entrusted by the Federal Government to devise technology-driven remedies for a variety of challenges confronting the agricultural industry, such as output, efficiency, environmental well-being, and wellness. Assessments of the impact of such research demonstrate that it has resulted in significant social benefits for end users (Voh, 2017).

NIHORT is a research and training institute that provides information and support to farmers and other stakeholders in the agricultural sector in Nigeria. NIHORT has mandates to research on genetic improvement, production, processing, storage, utilization, and marketing of tropical fruits, vegetables, spices, and ornamental plants of both nutritional and economic importance. The institute has implemented various communication strategies to promote the utilization of agricultural technologies among farmers in adopted villages. It also has several adopted villages and schools among which are Awaye community, Egbeda local government area, and Oba Abass Aleshinloye Grammar School, Eleyele in Ibadan North West Local Government Area Ibadan, Oyo state, Nigeria, where different agricultural technologies from the institute have been disseminated through diverse communication strategies.

The "adopted villages and schools" concept was introduced to the National Agricultural Research Institutes (NARIs) in Nigeria in 1996 by the National Agricultural Research Project to combat rural poverty among farmers in Nigeria. The programme was developed to make it easier for scientists to test recent findings from research in the context of the local environmental circumstances faced by farmers (Essiet, 2013; Onagwa, 2016; Yusuf et al., 2019). In addition, technologies generated in the institutes are disseminated to farmers in the adopted villages, which must be less than 25 km from the adopting institution, according to operational rules (Essiet 2013). The aim is to speed up the adoption of such technologies by

neighbouring farmers. These trials will also serve as demonstration plots and act as a platform for disseminating them to other villages (Omisope, 2020). The project aims to ensure socioeconomic and livelihood advancement with enhanced credit support and financial inclusion of farmers in such villages (Onagwa, 2016).

Therefore, this paper aims to examine perceived influence of NIHORT's communication strategies on agricultural technologies utilization among adopted village commercial farmers in Awaye community, Egbeda local government area, and student farmers in Oba Abass Aleshinloye Grammar School, Eleyele in Ibadan North West Local Government Area Ibadan, Oyo state, Nigeria. Specifically, however, this study seeks to:

1. Find out how often the commercial farmers and student farmers have access to agricultural messages through NIHORT's communication strategies.
2. Find out the extent of exposure of commercial farmers and student farmers to NIHORT's communication strategies in disseminating agricultural technologies in the study adopted village.
3. Find out farmers' perception of the communication strategies deployed by NIHORT in disseminating agricultural technologies in the study adopted village.

The study hypothesized that:

H₀₁ - There is no significant difference between the farmers' extent of exposure and perception of the communication strategies deployed by NIHORT in disseminating agricultural technologies.

H₀₂ - There is no significant difference between farmers' perception of the communication strategies and their level of utilization of the agricultural technologies transferred by NIHORT.

2. Literature Review

Lack of knowledge and insufficient broadcast of agricultural information and technology adoption through different communication strategies could lead to farmers' inefficiency (Akintayo, 2022). Though, farmers have utilized various sources of agricultural knowledge (Ifeanyieze et al., 2017; Mtega, 2018; Mohammed, 2018; Mubofu & Malekani, 2020), the usage of these sources is influenced by factors such as accessibility of devices, gender-based division of labour, language, number of agricultural programmes aired, and awareness of the broadcasting schedule (Mtega, 2018). However, to enhance the accessibility of agricultural knowledge, extension agents should assess the needs of their audience and disseminate relevant information in a timely manner (Mtega, 2018). This would not only increase the knowledge base of farmers but also lead to increased adoption and

utilization of agricultural practices (Ifeanyieze et al., 2017).

The National Horticultural Research Institute (headquarters), located in Ibadan, Oyo State, Nigeria, was established in 1975 with the assistance of the United Nations Development Programme (UNDP) in conjunction with the Food and Agricultural Organization (FAO) as a fruit and vegetable research and demonstration centre. It acquired the status of a national institute in June 1976. The Institute's headquarters is situated on 350 hectares of land in the Jericho Reservation Area, Idi-Ishin, Ibadan, in the rainforest agro ecological zone of southwestern Nigeria. To give a national outlook, the institute has two substations located in Mbato-Okigwe, Imo state in South-Eastern Nigeria, and the other at Bagauda, Kano state.

The study was conducted in one of the NIHORT's adopted villages and schools, Awaye community, Egbeda local government area, Ibadan, and Oba Abass Aleshinloye Grammar School, Eleyele in Ibadan North West Local Government Area Ibadan, Oyo state, Nigeria. The study population comprised 35 adopted village commercial farmers and 16 student farmers who participated in the dissemination of agricultural technologies programmes between 2009 and 2023, selected using the total enumeration sampling procedure. Total population sampling, also known as census sampling or complete enumeration technique, according to Anggraini and Melinda (2018) and Mufidah (2020), is a method of sampling in which the entire population is treated as a sample. It examines a complete population that possesses a certain set of traits (Canonizado, 2021). Primary data were collected using a structured questionnaire that elicited information from the farmers and were analyzed using descriptive statistics (mean score and ranking) and inferential statistics (Analysis of Variance).

3. Methodology

Variable	Frequency	Percentage	Mean	SD
Gender			1.69	0.47
Male	16	31.4		
Female	35	68.6		
Farming Category of respondent			1.75	1.45
Crop farmer	39	76.5		
livestock	2	3.9		
Mixed farming	4	7.8		
Processor	6	11.8		
Age			2.37	1.77
15-25	27	52.9		
26-35	4	7.8		
36-45	7	13.7		
46-55	6	11.8		
56-65	1	2.0		
66 and above	6	11.8		
Years of farming experience			1.90	1.40
1-10	32	62.7		
11-20	6	11.8		
21-30	5	9.8		
31-40	2	3.9		
41 and above	6	11.8		
Educational status			2.16	0.78
primary	8	15.7		
secondary	31	60.8		
tertiary	8	15.7		
none	4	7.8		

Farmers’ Socio-economic Characteristics

Gender: Findings from Table 1 revealed that 31.4% of the respondents are male while 68.6% are female. This shows that females are predominantly involved in the agricultural production in the adopted village.

Farming category of respondent: Data presented on the different categories of enterprise the farmers ventured in were also considered as a socio-economic characteristic and the findings in Table 1, shows that 76.5% of the farmers were engaged in crop production. This is implying that most of the respondents are food crop farmers.

Age: Results from Table 1 showed that 52.9% of the farmers were between ages 15-25 years and 62.7% had 1-10 years farming experience. This implies that most of the farmers in the study area are youth with quantum number of years of experience in the system of farming.

Educational status: Results in Table 1 showed that 60.8% of the respondents had secondary education. This shows that most of the respondents in the study area attained secondary school education and could be said to be literate.

Table 2: Access to Agricultural Messages through Communication Strategies by NIHORT

S/N	Item	Fortnightly F(%)	Monthly	Quarterly	Bi-annual	Not at all
1	Interpersonal Communication (Face-to-face)	3(5.9)	12(23.5)	9(17.6)	25(49.0)	2(3.9)
2	Poster/flipbook	29(56.9)	1(2.0)	11(21.6)	4(7.8)	6(11.8)
3	Field demonstration	8(15.7)	5(9.8)	9(17.6)	26(51.0)	3(5.9)
4	Empowerment training	8(15.7)	6(11.8)	10(19.6)	23(45.1)	4(7.8)

Source: Field Survey, 2023

Table 2 findings revealed that at least more than half of the farmers and student farmers have access to Poster/flipbook (56.9%) fortnightly, and Field demonstration (51%) used by NIHORT as forms of communication strategies in disseminating agricultural technologies. Although, NIHORT also make use of interpersonal communication (49%) and empowerment training (45.1%) to disseminate agricultural information but they are not majorly accessible like the former.

Table 3: The extent of exposure to the communication strategies used by NIHORT to disseminate agricultural messages

S/N	Item	Not at all F(%)	Very Extent	Low	Low Extent	High Extent	Very Extent	High
1	Interpersonal Communication (Face-to-face)	7(13.7)	10(19.6)	5(9.8)	27(52.9)	2(3.9)		
2	Poster/Flipbook	26(51.0)	2(3.9)	7(13.7)	11(21.6)	4(7.8)		
3	Field demonstration	27(52.9)	2(3.9)	8(15.7)	10(19.6)	4(7.8)		
4	Empowerment training	26(51.0)	7(13.7)	4(7.8)	2(3.9)	12(23.5)		

Source: Field Survey, 2023

Table 3 showed the degree of exposure of the commercial farmers and student farmers to NIHORTs’ communication strategies. The results revealed that interpersonal communication (face-to-face) to a high extent is well exposed to by the respondents.

Table 4: The Perception on NIHORT’s communication strategies, channels and messages with regard to agricultural technology transfer

S/N	Item	Strongly Agree F(%)	Agree	Disagree	Strongly Disagree	Mean	Rank
1	The channel of communication is inappropriate	4(7.8)	14(27.5)	26(51.0)	7(13.7)	2.29	9 th
2	The channel of communication is inaccessible	9(17.6)	14(27.5)	22(43.1)	6(11.8)	2.51	7 th
3	The format of message delivery is inappropriate	11(21.6)	17(33.3)	16(31.4)	7(13.7)	2.63	4 th
4	Method of message delivery is faulty	5(9.8)	19(37.3)	16(31.4)	11(21.6)	2.35	8 th
5	Language of delivery is inappropriate	6(11.8)	26(51.0)	12(23.5)	7(13.7)	2.61	5 th
6	Time of message delivery is inappropriate	7(13.7)	21(41.2)	13(25.5)	8(15.7)	2.55	6 th
7	Farmers’ inclusiveness is lacking in the design of communicated message	12(23.5)	23(45.1)	10(19.6)	5(9.8)	2.88	2 nd
8	There is trust in NIHORT and its agricultural information disseminated	25(49.0)	12(23.5)	9(17.6)	5(9.8)	3.12	1 st
9	The message has consideration for farmers’ cultural values	12(23.5)	19(37.3)	15(29.4)	5(9.8)	2.75	3 rd

Source: Field Survey, 2023

The findings in Table 4 revealed that farmers (\bar{X} =3.12) perceived that there is trust in NIHORT’s communication strategies and the agricultural information disseminated through them, which encouraged the adoption of fertilizer application technology introduced through NIHORT, and resulted in increase in their farm production. This is ranked first in the perception scale. The second ranked in the perception scale as presented in the Table 4 revealed that average (\bar{X} =2.88) farmers perceived that farmers’ inclusiveness is lacking in the design of communicated message, hence, its resultant effects in farmers’ perception of NIHORT’s format of message delivery (\bar{X} =2.63) and language of delivery (\bar{X} =2.61) as inappropriate. However, the third ranked in the perception scale as shown in the Table 4 revealed that farmers (\bar{X} =2.75) perceived that the agricultural message disseminated through communication strategies by NIHORT has consideration for farmers’ cultural values.

Table 5: Level of Utilization of Agricultural Technologies transferred by NIHORT based on the Communication Strategies deployed

S/N	Item	Not at all influential F(%)	Slightly influential	Somewhat influential	Very influential	Extremely influential	Mean	Rank
1	Interpersonal Communication (Face-to-face)	8(15.7)	16(31.4)	9(17.6)	6(11.8)	12(23.5)	3.04	High
2	Poster/flipbook	4(7.8)	2(3.9)	3(5.9)	7(13.7)	35(68.6)	1.69	Low
3	Field demonstration	2(3.9)	2(3.9)	20(39.2)	11(21.6)	16(31.4)	2.27	High
4	Empowerment	5(9.8)	6(11.8)	10(19.6)	8(15.7)	22(43.1)	2.29	High
5	Field day	5(9.8)	7(13.7)	15(29.4)	4(7.8)	19(37.3)	2.50	High
6	Social media	2(3.9)	2(3.9)	5(9.8)	10(19.6)	32(62.7)	1.67	Low
7	Phone call	5(9.8)	4(7.8)	3(5.9)	5(9.8)	33(64.7)	1.86	Low
8	Radio/TV programme	6(11.8)	2(3.9)	6(11.8)	6(11.8)	31(60.8)	1.94	Low
	Grand mean (GM)						2.16	

The findings as presented in the Table 5 shows that the respondents were highly influenced by interpersonal communication (\bar{X} =3.04), field demonstration (\bar{X} =2.27), empowerment training (\bar{X} =2.29) and field day (\bar{X} =2.50).

4. Discussion

4.1 Access to Agricultural Messages through Communication Strategies by NIHORT

The result based on objective one revealed that the adopted village commercial farmers and adopted school student farmers have access to different communication strategies at different intervals. This pluralistic approach is however in tandem with Kaliba et al. (2018), which states that, to reach specific groups of farmers, it is important to develop pluralistic research and extension systems, as these sources of information can reinforce each other (Bello et al., 2021; Jiang et al., 2021), and that accessing agricultural information sources can also increase the adoption of new technologies (Uwandu et al., 2018).

4.2 Extent of Exposure to the Communication Strategies used by NIHORT

The findings based on objective two revealed that interpersonal communication (face-to-face) to a high extent is well exposed to by the respondents. This result however implied the need for NIHORT to work on exposing the farmers to other communication strategies to encourage the adoption of new agricultural technologies, and create systematic linkages between research and development, as this, according to Yigezu et al. (2018) can increase farmers' awareness and exposure to the agricultural technologies.

4.3 The Perception on NIHORT’s Communication Strategies, Channels and Messages

The findings based on objective three revealed that both the commercial farmers and the student farmers perceived that there is trust in NIHORT’s communication strategies and the agricultural information disseminated through them, which encouraged the adoption of fertilizer application technology introduced through NIHORT, and resulted in increase in their farm production. This is ranked first in the perception scale. This finding is in support of Baba et al. (2019) and Jha, et al, (2020), which submit that farmers’ perceptions might partially affect technology adoption, with significant impact on farmers’ productivity and livelihoods (Sennuga et al., 2020). These results also corroborate Kanesh et al.’s (2022) submission that, perception has a favourable influence on attitude, which in turn affects behavioural intention

Hypothesis 1:

Table 6: There is no significant difference between the farmers’ extent of exposure and perception of the communication strategies deployed by NIHORT in disseminating agricultural technologies

Variable	Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.	Decision
Perception	-0.082	0.146	-0.559	0.579	NS

Results from Table 6 revealed that there is no significant difference between the farmers’ extent of exposure and perception of the communication strategies deployed by NIHORT in disseminating agricultural technologies.

Hypothesis 2:

Table 7: There is no significant influence between farmers’ perception of the communication strategies and their level of utilization of the agricultural technologies.

Variable	Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.	Decision
Utilization	0.023	0.194	0.153	0.879	NS

Table 7 revealed that there is no significant association between the perception of the farmers on the NIHORT communication strategies and technology utilization. This outcome is contrary to the submissions of Baba et al. (2019) and Jha, et al, (2020), which submit that farmers’ perceptions might partially affect technology adoption

5. Conclusion

This paper examined perceived NIHORT's communication strategies on agricultural technologies utilization among adopted village commercial farmers in Awaye community, Egbeda local government area, and student farmers in Oba Abass Aleshinloye Grammar School, Eleyele in Ibadan North West Local Government Area Ibadan, Oyo state, Nigeria. The results from the findings established the fact that to encourage, promote and make informed farming decisions, the use of communication channels like extension agents and farmers' communication factors, including human relations, communication behaviour and skills, and role performance, should be included to convey relevant information (Mohammed, 2018). Also, according to Coker et al. (2018), in order to improve the technical efficiency of agricultural technology, increase in extension support directed at farmers to ensure optimal and appropriate utilization of agricultural technologies is essential.

6. Recommendations

This paper therefore recommended that efforts should be made by agricultural stakeholders to always consider integration of farmers' needs into communication framework to provide agricultural technologies' utilization within farming communities to enhance sustainable agricultural productivity in Nigeria.

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