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### Mutuality of extension-farmer communication methods in dissemination of postharvest technology information in Kwara State

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#### Abstract

The medium of communication employed by agricultural extension officers in the dissemination of postharvest technology and information influences the adoption rate in a social system. The exploratory study assessed the forms of communication used in disseminating postharvest information; factors considered in selecting forms of communications used and the feedback effectiveness of communication forms used by extension officers. A multistage purposive sampling technique was used to select 75 field extension workers of Kwara Agricultural Development Project (KWADP) on which a structured interview schedule was administered. Descriptive statistics such as frequency and percentages were used to analyze the collected data. Findings show that agricultural extension workers utilized Audio, visual, written methods as well as social media platforms. Audio methods such as general meetings (85.3%), farm visits (86.7%) and telephone calls (70.7%) are the most widely used methods while written forms such as advisory booklets (33.3%), articles (28.0%) and personal letters (21.3%) are the least employed methods. The number of Farmers to be reached (69.3%); nature of message to be disseminated (74.7%) and characteristics of end-users 72.0% were the major factors considered by extension workers in selecting forms of communications to be used in dissemination efforts. Also, Audio methods such as farm visits (38.7%) radio (37.3%), home visits (28.0%) and general meeting (26.7%) were considered to be the most effective communication methods. It is recommended that the effective communication methods used by the extension agents should be strengthened to further enhance innovation dissemination and adoption by the farmers.

**Keywords:** Communication forms, effectiveness, extension workers

#### 1. Introduction

Post-harvest technologies are important parts of any agricultural system and are vital in all circumstances, whether there is surplus or deficit (Vilane, Shongwe, Motsa, & Shongwe, 2012) <sup>[10]</sup>. Utilizing improved post-harvest technologies often results in reduced food losses, improved overall quality and food safety, and a higher profit for growers and processors of crops (Tashi, 2015) <sup>[9]</sup>.

Post-harvest food losses are a major concern and occur in most food distribution chains throughout the world. Not only do losses constitute lost income to farmers, processors and traders but they also contribute to food insecurity, a loss of food means less food is available for the consumer.

The aim of agricultural extension is to disseminate agricultural technologies to improve the productivity of farmers' welfare and household nutritional status (Fabiya, 2015) <sup>[4]</sup>. From the foregoing, extension has been recently defined as "systems that facilitate the access of farmers, their organizations and other market actors to knowledge, information and technologies; facilitate their interaction with partners in research, education, agribusiness, and other relevant institutions; and assist them to develop their own technical, organizational and management skills and practices". (Christoplos, 2010) <sup>[11]</sup>.

It is the function of the extension agents or workers to employ the extension methods which provide opportunities for rural people to learn and which stimulate mental and physical activities among the people. Usually the objectives set out to achieve in training during post-harvest knowledge

transfer determines the approach. In all, post-harvest programs, building knowledge and skills are as important as the communication technique and relationship between trainees and the extension agents. It is therefore, important for extension practitioners to employ the combination of many extension methods to improve the dissemination of agricultural technology to end-users especially in the post-harvest value chain.

#### Problem statement

The extension agents also have a lot of problems and challenges; they are still few in number with low extension agents to farmers' ratio. While Food and Agricultural Organization (FAO) recommends one extension agent to 800 farmers, the ratio in Nigeria ranges from 1:1000 in Imo State to 1:10, 568 in Bayelsa State with national average of 1:3011 (NAERLS, 2012) <sup>[7]</sup>. The major method of technology dissemination employed by extension workers in the study area is through face-to-face dissemination during the monthly technology review meeting (MTRM) and fortnight training (FNT), which has become inadequate to equip the agricultural extension workers (Olaitan *et al.*, 2017) <sup>[8]</sup>. Hence, this study was out to investigate if there are other forms employed by agricultural extension workers in the study area to disseminate agricultural information especially post-harvest technology dissemination.

#### Objectives of the study

The general objective is to assess the communication

methods used in the dissemination of Post-harvest Technology Information in Kwara State.

The specific objectives are to:

1. Ascertain the socioeconomic characteristics of the respondents.
2. Identify the types of communication methods used by the respondents.
3. Examine the factors considered in selecting the forms of communication.
4. Identify the types of post-harvest technologies introduced to farmers in the study area.

### Methodology

This study was conducted in Kwara State, Nigeria. Kwara State is in north central part of Nigeria. A multistage sampling technique was used to select 75 field extension workers of Kwara Agricultural Development Project

(KWADP) for the study. The first stage involves, the purposive selection of agricultural extension workers from the four zones (A, B, C and D) of Kwara Agricultural Development Project (KWADP) because of the presence of extension workers in all the local government area of the state. The second stage involves, the random selection of twenty (20) respondents each from (3) zones (B, C and D) of KWADP in Patigi, Shao and Igbaja, while fifteen (15) respondents were selected in zone A (Kaima), due to few numbers of Extension officers compared with other zones, making a total of seventy-five (75) respondents for the study. The primary data for this study was collected with the aid of a structured questionnaire.

Data were analysed using statistical package for social science (SPSS). Descriptive statistical tools such as frequency counts, percentages, mean, were used to analyse the data collected.

### Results and Discussion

**Table 1:** Socio-economic Characteristics (n=75)

Variable Group	Frequency	Percentage	Mean
<b>Age (in years)</b>			
21 –30	13	17.3	36.3
31 – 40	43	57.3	
> 41	19	25.3	
<b>Gender</b>			
Male	47	62.7	
Female	28	37.3	
<b>Level of Education</b>			
National diploma	5	6.7	
HND	17	22.7	
BSc`	41	54.6	
M.Sc	12	16.0	
<b>Marital Status</b>			
Single	6	8.0	
Married	69	92.0	
<b>Years in service</b>			
1-5	28	37.3	7.5
6-10	31	41.3	
11- 15	12	16.0	
16 >	4	5.3	
<b>No of Training attended</b>			
Nil	4	5.3	7.9
1-5	34	45.3	
6-10	18	24.0	
11-15	7	9.3	
16-20	3	4.0	
>20	9	12.0	
<b>No of Professional body</b>			
Non	33	44.0	
1-2	36	48.0	
3-4	6	8.0	

**Source:** Field survey, (2021)

The results in Table 1, shows that, the mean age of extension officers in the study area is 36 years, with a modal age class of 31-40. This implies that the respondents are still in their productive years and should be highly responsive to disseminating useful and practical information to farmers, this is in line with. Who noted that age is an important factor that influences people's attitude, skills, and aspirations? There are more male (62.7%) than females (37.3%) extension officers in the study area. This is in tandem with

report of Swanson, that female extension agents were few than their male counterparts. 92% of the respondents were married. The majority of the respondents were educated with a higher concentration (54.6%) having a B.Sc degree. It is generally assumed in Nigeria that extension job is a low status job fit only for job applicants possessing low academic qualifications (Ejemi *et al.*, 2006) [3]. The result of this study contradicts this view. It indicates high knowledge structure of extension workforce compared to

what existed in few decades ago. Extension officers in the study area had an average of 8 years of working experience. This implies that the respondents have been involved in extension services for quite a number of years and should be sufficiently experienced in communicating agricultural information from researchers to farmers. The table also shows that majority of the respondent attended training, 48% are members of 1-2 professional bodies whereas 44% do not belong to any professional body.

**Table 2:** Forms of communication used in disseminating post-harvest information

Forms of Communication	Used (%)	Unused (%)
<b>Written</b>		
Bulletin	53.3	46.7
Advisory Booklet	33.3	66.7
Leaflet	50.7	49.3
Newspaper	42.7	57.3
Article	28.0	72.0
Personal Letter	21.3	78.7
Circular	34.7	65.3
Extension Guide	76.0	24.0
<b>Visual</b>		
Result Demonstration	52.0	48.0
Exhibits	41.3	58.7
Charts	26.7	73.3
Slides	33.3	66.7
Motion Pictures	29.3	70.7
Posters	56.0	44.0
<b>Spoken</b>		
Radio	58.7	41.3
Telephone	70.7	29.3
Special Meeting	49.3	50.7
General Meeting	85.3	14.7
Home Visit	52.0	48.0
Farm Visit	86.7	13.3
<b>Visual and Spoken</b>		
Meeting involving chart	36.0	64.0
Meeting with method demonstration	66.7	33.3
Meeting with result demonstration	61.3	38.7
Meeting involving motion picture	41.3	58.7
<b>Social media</b>		
Whatsapp	76.0	24.0
Facebook	45.3	54.7

Source: Field survey, (2021)

Table 2, shows that for written form of communication, majority (76%) of the respondent disseminates information through the use of extension guide, 53.3% through bulletin and 50.7% through leaflets. This implies that extension guides is the most extensive form of written communication used by extension officers to disseminate post-harvest information in the study area. Result demonstration. Furthermore, for spoken form of communication, farm visit (86.7%), general meeting (85.3%), telephone (70.7%) and radio (58.7%) are the major methods used by the extension officers disseminates post-harvest information. This may be as a result of the fact that these methods give farmers opportunity to be active participants during the teaching and learning process as they allow sharing and exchange of information between the extension agent and the farmers. For audio and spoken methods, 66.7% disseminate information through meeting with method demonstration and 61.3% through meeting with result demonstration, this

means that meeting with both method and result demonstrations were the most widely used visual and spoken form of communication. This result corroborates that of Yekinni, & Afolabi, (2019) [11] who reported that the major extension communication methods used by the extension agents to disseminate agricultural information to respondents were farm visit (89.2%) and home visit (78.5%), contact farmers (73.3%), method demonstration (51.7%) result demonstration (42.5%), and radio (20.0%) 76% of the extension officers used WhatsApp while 45.3% used Facebook. This implies that Whatsapp is the most common social media used by the respondent in disseminating post-harvest information. The greater number of respondents that used Whatsapp could be as a result of its popularity and cheap network subscription. According to Kamani, *et al.*, (2016) [6], over 27 billion messages are sent by over 300 million users every day on Whatsapp, in addition to text messaging, Whatsapp users can also make audio and video calls, send each other images, videos, audio media messages, etc. with little cost (Devesh, Mahesh & Sushil, 2017) [2]. This result is similar to the works of Iwuchukwu, Eke, & Nwobodo, (2019) [5]. Who reported that Facebook and WhatsApp were social media that the majority of the extension agents used for communication, although, they reported that Facebook (82.4%) had a higher percentage used as compared to Whatsapp (74.2%).

**Table 3:** Factors considered in selecting forms of communications used

Factors	Frequency	Percentage
<b>Nature of message to be disseminated</b>		
Yes	56	74.7
No	19	25.3
<b>Characteristics of farmers</b>		
Yes	54	72.0
No	21	28.0
<b>Possessing the skill to use the form of communication</b>		
Yes	40	53.3
No	35	46.7
<b>Cost Involved</b>		
Yes	49	65.3
No	23	34.7
<b>Availability of Communication Form</b>		
Yes	51	68.0
No	24	32.0
<b>State of Adoption of the farmers</b>		
Yes	44	58.7
No	31	41.3
<b>Number of Farmers to be reached</b>		
Yes	52	69.3
No	23	30.7
<b>Institutional Support</b>		
Yes	48	64.0
No	27	36.0
<b>Opportunity for feedback</b>		
Yes	46	61.3
No	29	38.7
<b>Time saving characteristics</b>		
Yes	43	57.3
No	32	42.7

Source: Field survey, (2021)

Table 3, shows the factors considered in selecting forms of communications used by extension officers in disseminating

post-harvest information. No single rule of thumb can be given for the selection and use of the various extension communication methods to ensure success in all situations, however, the following factors are considered by the extension officers in the study area. The most important factors considered includes, nature of message to be disseminated (74.7%), Characteristics of the farmers (72%), number of farmers to be reached (69.3%), availability of communication form (68%) and cost involved (65.3%).

**Table 4:** Post-harvest technologies introduced to farmers by extension officers

Post-harvest Technologies	Frequency	Percentage
<b>Improved Yam Barn</b>		
Introduced	49	65.3
Not Introduced	26	34.7
<b>Inert Atmospheric Silo</b>		
Introduced	26	34.7
Not Introduced	49	65.3
<b>Cassava Stem Trench</b>		
Introduced	44	58.7
Not Introduced	31	41.3
<b>Improved Maize Crib</b>		
Introduced	49	65.3
Not Introduced	24	34.7
<b>Fish Smoking Kiln</b>		
Introduced	48	57.3
Not Introduced	27	42.7
<b>Improved Fruit Shed</b>		
Introduced	28	37.3
Not Introduced	47	62.7
<b>Solar Tent Dryer</b>		
Introduced	19	25.3
Not Introduced	56	74.7
<b>Evaporative Cooling System</b>		
Introduced	21	28.0
Not Introduced	54	72.0
<b>Parabolic Shaped Dryer</b>		
Introduced	13	17.3
Not Introduced	62	82.7
<b>Hermetic Storage (Drums, PICS, Zerofly bags)</b>		
Introduced	60	80.0
Not Introduced	15	20.0
<b>Multicrop Dryer</b>		
Introduced	25	33.3
Not Introduced	50	66.7
<b>Improved Vegetable Basket</b>		
Introduced	38	50.7
Not Introduced	37	49.3
<b>Polyethylene lined Jute Bags</b>		
Introduced	32	42.7
Not Introduced	43	57.3
<b>Stack-able Vegetable Fruit Basket</b>		
Introduced	31	41.3
Not Introduced	44	58.7

Source: Field survey, (2021)

Table 4, shows the list of post-harvest technologies introduced by extension officers to farmers in the study area and how conversant they are with the technologies. The most introduced post-harvest technologies are the hermetic storage (80%), improved yam barn (65.3%), improved maize crib (65.3%), cassava stem trench (58.7%), and fish smoking kiln (57.3%). The study revealed that 6 out of 14

post-harvest technologies sampled enjoyed high dissemination percentage. This shows that a lot still needs to be done in the area of post-harvest technologies dissemination to farmers by relevant stakeholders in the study area.

### Conclusion

Spoken methods such as general meetings, farm visits and telephone calls are the most widely used methods, posters for visual method, extension guide for written, while meeting with method demonstration for visual and spoken. The number of Farmers to be reached; nature of message to be disseminated and characteristics of end-users were the major factors considered by extension workers in selecting forms of communications to be used in dissemination efforts. Also, Audio methods such as farm visits, radio, home visits and general meeting were considered to be the most effective communication methods used by the extension workers.

### Recommendations

1. It is recommended that the effective communication methods used by the extension agents should be strengthened to further enhance innovation dissemination and adoption by the farmers and other end-users of post-harvest technologies.
2. Research institute like Nigerian stored products research institute with mandate in post-harvest research and extension, will need to do more to make accessible their proven technologies to end users in the study area.

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