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EXTENSION COMMUNICATION AND FARMERS' ADOPTION OF YAM PRODUCTION TECHNOLOGIES IN SOUTH – SOUTH NIGERIA

NNEOYI I. OFEM, H. M. NDIFON, KALU I. OGBONNA AND O. E. NTUI

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ABSTRACT

The study was carried out to assess the role of extension communication on farmers' adoption of yam production technologies in Nigeria. It was found that yam production technologies like yam minisett, yam/cocoyam/ cassava intercrop, yam/cowpea/maize intercrop, training of vines, use of agrochemicals and yam storage in barns were disseminated to famers to boost yam production. It was found that yam minisett had the lowest adoption rate of 8.57% due to inability to produce immediate monetary benefits to farmers, inadequate awareness, unavailability of training on seed yam multiplication and small size nature of yam minisett, while yam intercropped with cowpea *[Vignia unquiculata)* and maize *[Zea mays)* had the highest adoption rate. At the same time, the study showed that agents, contact farmers, posters, bulletins and radio served as sources of information to the farmers. The study also showed that sources of information/communication channels play significant role in creating awareness, helping farmers develop interest, evaluate technologies and adopt technologies, however the study shows that there is no significant relationship between channels of communication and adoption of yam production technologies as farmer adoption depend also on the availability of support services like credits, tenures security, government policy among others.

KEY WORDS: Adoption, Communication, Channels, Extension, Production, Technologies.

BACKGROUND

Nigeria is one of the highest yam producing nations in the world accounting for over 75% of world yam output (Okwor, 2001). Among the yam zones of West Africa (Hahn et al., 1993) Cross River State, Nigeria is noted for its large scale production, this is given the social and cultural values attached to yams which accounts for 80% of the crop mixture. However, yam output has been generally declining due to the capital and labour Intensive nature of yam production. Research efforts have been geared towards providing improved yam varieties and technologies especially yam minisetts, but these technologies and others are seldom translated and disseminated to the farmers.

The adoption of agricultural technologies is generally acknowledged to contribute significantly to agricultural productivity. But one of the problems of agricultural development in developing countries is that farmers seldom adopt research results due largely to inadequate awareness and poor communication infrastructure to disseminate the available research results (Adebayo, 1997). The linkage between research extension and farmers is generally weak which accounts for the low levels of awareness and adoption of technologies. Farmers rely on their traditional practices and where extension services are available, their frequency of visits and impacts on farmers' knowledge are most often insignificant. This situation calls for a system which guarantees effective and efficient communication of technologies to farmers. Specifically, extension communication is a strategic instrument for technology diffusion among farmers, Mohammed and Garforth (1999). Extension communication for yam technology dissemination would involve increasing the capacity of extension agents to communicate technologies: through training, provision of communication infrastructure, within the rural yam producing communities, motivating extension staff and using systems that are participatory. In Nigeria, the systems approach to communication of technologies has been lacking (Ogunbameru, 2001). Agricultural policies in most developing countries have weak extension communication components and where they are available emphasizes extension contacts than the use of other channels like mass media which would have created more awareness.

Nneoyi I. Ofem, Department of Agricultural Economic / Extension, Faculty of Agriculture, Forestry and Wildlife, University of Calabar, Calabar, Nigeria
H. M. Ndifon, Department of Agricultural Economic / Extension, Faculty of Agriculture, Forestry and Wildlife, University of Calabar, Calabar, Nigeria
Kalu I. Ogbonna, Department of Agricultural Economic / Extension, Faculty of Agriculture, Forestry and Wildlife, University of Calabar, Calabar, Nigeria
O. E. Ntui, Department of Agricultural Education, Cross River State College of Education, Akamkpa - Cross River

The choice of yam by this study and the focus on the role of extension communication in enhancing its adoption is predicated on the important role yam has played as a food security crop and the dwindling output of the crop in the region. Given the investments in yam research, little is done to encourage adoption by farmers and boost production. Hence the study was designed to identify the types of yam production technologies disseminated to farmers; the levels and rates of adoption of these technologies; identify extension communication channels for yam production technologies and the relationship between communication channels and adoption of yam production technologies.

Materials and Methods

A farm level survey was conducted during October, 2004 in Ikom agricultural zone of Cross River State, Nigeria. The zone comprises Yakurr, Obubra, Abi, Ikom, Etung and Boki Local Governments respectively. The zone falls within the tropical rain forest belt where yams are the important component of the mixed cropping systems. Four local governments were randomly selected; Ikom, Boki, Obubra and Yakurr out of the six in the zone. From each local government, three farming communities were selected at random. From each selected community, twenty five (25) yam farmers were selected at random as respondents. The total numbers of communities used for the study were twelve (12). Thus, the total numbers of respondents were 300. A stratified random sampling technique was adopted to achieve a representative sample. The data were collected through farmers' interview using a well structured questionnaire. To establish content and face validity of the instruments, agricultural extension experts and agronomists in the Faculty of Agriculture, University of Calabar, reviewed items raised in the questionnaire. To establish reliability, the instrument was subjected to a pre-test in farming communities with similar characteristics to those involved in the study. To eliminate ambiguity in the questionnaire Items, a test retest method was used. A reliability coefficient analysis on the pilot test data produced a reliability coefficient of 0.67. The instrument was administered by the researcher to all respondents (N = 245) using extension agents in the farming communities.

Data generated from the study were coded and analyzed using descriptive statistics and inferential statistics such as non-parametric (chi-square) and parametric (Pearson Product Moment Correlation). The five-point Likert scale was used to assess respondents' level of agreement on the list of items dealing with problems militating against extension communication in the adoption of yam production technologies.

A five-point rating system was used to assess respondents' agreement on available channels of communication in the study area.

The respondents rated their levels of agreement with the following scale 5 = strongly Agree; 4 = Agree; 3 significant relationship ($P < 0.05$) between extension communication and farmers adoption of yam production technologies.

For null hypothesis 1 - The chi square test was used
For null hypothesis 2 - The Pearson Product Moment Correlation was used.

RESULTS AND DISCUSSION

Types of Yam Production Technologies Disseminated to Farmers

It was observed that several yam production technologies were disseminated to farmers. From table 2 about seven technologies: yam minisett, yam, cocoyam, cassava intercrop, yam, cowpea, maize intercrop, training of yams with vines, use of agro-chemicals, application of fertilizers and storage of yams in barns were already disseminated to the farmers in study area.

Table 2 shows that for yam minisett, about 75 farmers representing 30.6 percent had knowledge of the technology, but only 21 farmers that is 8.87 percent adopted it. This however, indicates low adoption rate. The low rate of adoption of yam minisett could be due largely to the fact that the farmers have not been able to reap sufficient monetary rewards from yam minisetts and the small size nature of yam minisetts which does not yield up to the 200g-100g seed yams required by most farmers. Ikeorgu (2003) had reported that the adoption rate of this (minisett) technology is still below 40 percent and this has been attributed to poor extension services and inadequate training of farmers on seed yam multiplication. The table also shows that yams intercropped with cocoyam and cassava as well as cowpea and maize had been disseminated to farmers. These yam intercrops indicated high rates of adoption, 55.10 percent and 76.73 percent respectively. This is so because intercropping is a common feature of small scale farmers in Southern Nigeria. Training of yam vines however indicates low knowledge levels, of 4.08% but very high adoption rate as compared to other technologies. Training of yam vines is a common practice among yam growers in the forest belt of Southern Nigeria, though the practice has been labour intensive for most farmers who had to exploit live trees for this purposes. The practice as noted by the study is commonly practiced to allow yam foliage absorb enough sunlight energy tor growth and high yields. However, the activity results to deforestation ultimately causing environmental damage (Ofem, 2005).

The table further reveals that agro-chemicals for weeding of yam farms is among the technologies packaged for farmers in the study area. 56 farmers representing 22.86% acknowledged to have adopted it. Conversely, the table indicates that many farmers about 105 have knowledge of fertilizers but only 25 percent adopted. This indicates a low adoption rate of fertilizer. This may be attributed to the high cost of fertilizers in the region and the high political and environmental

cent. This could imply that farmers do not acquire knowledge on "barn storage" from extension contacts, as the practice is common among farmers in the region, as a high adoption rate of 63.67 percent has shown. However, the table also reveals a slight increase in the rate of "abandon adoption" of 35,00% for the technology. This may be that storage in open and exposed barns as is the practice in the study area exposes yams to theft, pest and disease infestation.

Training of vines is only known by 10 farmers i.e. 4.08%. This could be due to the fact that training of yam vines is a common practice by farmers in the Ikom Agricultural zone which falls within the high forest zone (Dunn, 1974). The table showed that agro-chemicals introduced is known by 16 farmers representing 6.53 percent with adoption rates of 22.86 percent. For fertilizers, 105 farmers 42.86 are aware of the technology with only 10.20% adoption rate. Fertilizer technology is generally disseminated and known by farmers in the zone. The low adoption rate is probably due to high cost of the input of fertilizers in Nigeria.

Table 1: Distribution of sampled farmers

Local Governments	Farming Communities	Number of respondents	Percentage
Ikom	Afi	25	8.33
	Okunni	25	8.33
	Edo	25	8.33
Boki	Bawop	25	8.33
	Nkim	25	8.33
	Ntamante	25	8.33
Obubra	Ochon	25	8.33
	Adun	25	8.33
	Ofat	25	8.33
Yakurr	Ugep	25	8.33
	Nko	25	8.33
	Idomi	25	8.33
Total		30	

Table 2: Types of Yam Production Technologies and their Stages of Adoption

Yam Production Technologies	Knowledge		Trails		Adoption		Abandon Adoption	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Yam minisett	75	30.61	24	9.80	21	8.27	25	10.20
Yam/cocoyam/cassava	20	8.16	38	15.51	135	55.10	52	21.22
Yam/cowpea/maize	25	10.20	32	13.06	188	76.73	0.00	0
Training of yam vines	10	4.08	20	8.16	190	77.55	35	14.28
Application of Agro-chemical	16	6.53	36	14.69	56	22.86	137	55.91
Application of Chemical	105	42.86	65	26.53	25	10.20	50	20.40
Storage/yam barns	03	1.22	35	14.29	156	36.67	86	35.10

Source: Field Survey, 2004

The rate of adoption measured as

$$\frac{\text{Level of adoption} \times 100\%}{\text{Sampled number}}$$

Table 3: Extension Communication Channels of Yam Production

S/N	Extension Communication Channels	Once a week	Forth nightly	Once a month	Every rare	None	Total	Cum average	Ratings
1,	Interpersonal communication								
	Extension Agents	56	30	80	60	19	779	3.17	1st
	Neighbours	15	0	20	90	120	435	1.78	10th
	Contact farmers	20	46	10	58	111	541	2.21	6th
2.	Group Communication channel								
	Lectures	16	30	20	59	120	498	2.03	7th
	Campaigns	13	35	85	52	60	624	2.55	4th
	Method/Demonstration	13	36	58	16	42	457	1.87	9»h
	Result/Demonstration	10	29	36	86	48	494	2.02	Qth
3.	Mass Media								
	Posters	22	28	92	63	40	664	2.71	^nd
	Bulletins	25	37	43	72	68	614	2.51	5th
	Radio	22	42	65	76	43	659	2.69	3rd.
	Television	10	16	41	92	86	507	1.07	11th

Source: Field survey, 2004
Cumulative Average: Total 779 + 234

Table 4: Chl-square Results of Extension Communication Channels and Adoption of Yam Production Technologies

Variables	X^2cal	X^2tab	Significant
Communication Channels adoption	94.34	12.59	5

Note df = 6
N = -250
P = 0.05
S = Significant

Table 5: Pearson Product Moment Correlation Coefficient and Test of Significance

Variables	V	r-cal	t-tab	Significance
Channels adoption	-0.47	-1.1906	2.371	NS

Levels and Rates of Adoption of Yam Production Technology

Table 3 shows that a significant number of farmers have adopted yam production technologies such as training of yam vines, 190 with adoption rate of 77.55 percent yam, cowpea, maize intercrop, 188 adoption level representing an adoption rate of 76.73%, storage of yam in barns with adoption level of 156 representing adoption rate of 63.67 percent yam, cocoyam, cassava, intercrop has adopted level of 135 with adoption rate of 55.10 percent. The table showed the adoption levels for agro-chemicals as 56 with adoption.

Extension Communication Channels for Yam Production Technologies

Extension communication channels for yam production technologies showed in table 3. It also shows the frequency with which the channels were used to disseminate information to farmers, the table shows that extension contacts with a mean of 3.17 has the highest frequency which implies that yam farmers get their information from extension agents in the field. Another important source of information to yam farmers in the zone is posters with a cumulative average of 2.71. This is closely followed by radio 2.69, campaigns 2.55 and bulletins 2.51. Extension communication channels that are seldom used for disseminating information on yam production technologies are television with cumulative average of 1.07, neighbour sources 1.78, method demonstrations 1.87. However, the study found that other sources like contact farmers cumulative averaged 2.21, lectures, 2.03, result demonstrations 2.02 have been sparingly used to disseminate information on yam production technologies. Why television usage in the study area indicated the lowest frequency may imply the unavailability of television in most households in the study area or zone and where available, electricity supply and frequency of telecast of agricultural programmes is low.

Furthermore, a test of hypothesis using chi-square statistical test (Table 4.0) showed that the observed chi-square of 94.34 was much higher than the critical chi-square of 12.59 for degrees of freedom A at 0.05 levels of significance. This means null hypothesis one was rejected. In other words, extension communication has a significant role to play in enhancing farmers' adoption of yam production technologies. Moreover the results of the Pearson Product Moment Correlation test (Table 5.0) for null hypothesis two showed the coefficient of correlation r, as 0.47, which indicates a negative and weak relationship between extension communication and adoption of yam technologies. Similarly, the test of significance for coefficient of correlations r at degree of freedom (N - 2) = 4, at 0.05 levels of statistical significance revealed observed t as - 1.1906 being less than theoretical which was 2.571. Therefore the null hypothesis two cannot be rejected. This implies that extension communications has no significant relationship with the adoption of yam production technologies. From the results obtained, it yam minisetts multiplication in particular, credit and finance security as well as technologies that lead to economics of scale in yam production such as labour economizing and less capital intensive technologies.

CONCLUSION AND RECOMMENDATIONS

Farmers in Ikom Agricultural zone, of Cross River State, Nigeria has been using yam production technologies disseminated by extension personnel of the Agricultural Development Project (ADP). Consequently,

i. Majority of the farmers in the study area get information in yam production from extension contacts, posters and radio.
ii. Campaign programmes proved a viable communication channel for technology dissemination for farmers in the study area.
iii. A large number of farmers knew about yam minisett technology but only few adopted it.
iv. Yam production technology intercropped with other crops revealed high adoption levels and rates among farmers in the study area.

Hence, the study recommends the following;

i. The yam minisett technology be modified, and made more elastic for enhanced farmer adoption.
ii. Extension communication infrastructure be provided to aid the dissemination of technologies to de-emphasize the over reliance on extension contacts.
iii. Extension communication process should be participatory involving farmers in the dissemination process.
iv. Finally, communication of technologies should be supported by credit and inputs provision to enhance adoptions.

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