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EFFECTIVENESS OF TRANSFER OF IMPROVED CASSAVA TECHNOLOGIES BETWEEN CONTACT AND NON CONTACT FARMERS IN OWERRI AGRICULTURAL ZONE, IMO STATE, NIGERIA

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Abstract
The study assessed the effectiveness of contact farmer's dissemination of improved technologies/information to their non-contact farmer counterparts in the study area. Cross-sectional survey was adopted in the study conducted in Imo State between September 2020 and November 2020. For this study, 120 respondents were selected from Owerri Agricultural Zone. The result showed that majority of the respondents were between 50 and 69 years for non contact farmers and between 40 and 69 years for contact farmers. Majority of the contact farmers (57%) attained secondary education. Most of the contact and non contact farmers are within farming experience ranges of 11 – 20 (37% and 43.3%) and 21 – 30 (30% and 24.5%) years of experience respectively. Findings from this study revealed that while there is no significant relationship between contact farmers' age and their effectiveness (r=-0.3243: p=0.05). Meanwhile, educational level (r = 0.4218: p = 0.05) and years of farming experience (r = 0.3995: p = 0.05) had a positive and significant relationship with the effectiveness of the contact farmers. The study therefore recommends training and agricultural education for the contact farmers.

Keywords: Effectiveness, contact farmers, contact farmers, cassava, improved technologies

Introduction

The main challenge facing agricultural extension in the 21st century is how to develop low-cost sustainable approaches for service provision that go beyond extending messages to playing key roles in promoting farmers as the principal agents of change in their communities. These approaches need to enhance farmers' learning and innovation and improve their capacities to organize themselves for more efficient production and marketing and to demand extension services (David, 2007; Davis *et al*., 2009; Leeuwis van den Ban, 2004). The task is especially complex, given the need for extension services to address the challenges of climate change, food insecurity, gender inequality, and globalization of agriculture (Christoplos, 2010; Haug *et al*., 2009; Scoones and Thompson, 2009). The principal purpose of the Training and Visit (T&V) system of extension was to have competent, well informed village-level extension workers (VLW) that would visit farmers frequently and regularly with relevant messages and bring back farmers problems' to research (Benor and Baxter, 1984). In Nigeria, the nation-wide adoption of the T & V extension system introduced through the World Bank financial support was perhaps the most outstanding development in agricultural extension over the past two decades. The T & V system was believed to be capable of overcoming the inherent weaknesses of the past agricultural extension approaches in the country and to improve the effectiveness of extension delivery to farmers. The overall objective of the T &V system was to build professional extension service that was capable of assisting farmers to raise production, increase their incomes, level of living and provide appropriate support for agricultural development (NAERLS, 1997).

Improving productivity, income and wellbeing demand regular and continued transfer of improved technologies to majority of farmers. This is a key to continued adoption of proven technologies by most farmers. It is the duty of agricultural Extension Agents to disseminate agricultural technologies to farmers. The dearth of qualified extension agents (EAs) to work with farmers has had an untold adverse effect on the performance of the agricultural and rural sectors. This has necessitated the use of contact farmers. Contact farmers are farmers formally selected and regularly trained by extension agents in the use of proven technologies with the hope that they would share their experiences with other farmers (Ekumankama and Ajala. 1996). They are not paid for their services; however, they receive free training from institutions promoting various agricultural technologies and receive seed and seedlings for setting up demonstration plots on their farms. This approach has the aim of reaching a large number of farmers in communities at low cost (Noordin *et al*., 2001) through multiplier effects that widen extension coverage in terms of number of farmers reached. This approach also enables farmers to adapt or innovate, make better decisions, and provide feedback to researchers and policy makers (Kiptot *et al*., 2006). When farmers are used as contact persons, they stand a chance of doing better than technicians because they know the audience and language better and use expressions that suit their environment (Mulanda *et al*., 1999). Contact farmers are particularly effective if they are not of much greater social status than those they train and they also instill some confidence in their fellow farmers as they demonstrate new practices (Mulanda *et al*., 1999).

Contact farmers are usually individuals with little or no formal education, who, through a process of training, experimentation, learning and practice, increase their knowledge and become capable of sharing with others; in effect functioning as extension workers (Selenar *et al*., 1997). Aw-Hassan *et al*. (2008) noted that contact farmers were similar across a wide range of characteristics to other farmers in the population (non-contact farmers). In effect, contact farmers are supposedly a major source of agricultural information to non-contact farmers. They are chosen according to their agricultural expertise and/or networking skills and previous training experience. Farmer to farmer extension according to Scarbourough *et al*. (1997) is defined as "the provision of training by farmers to farmers, often through the creation of a structure of farmer promoters and farmer trainers*"*. Farmer-to-farmer extension programs date back at least to the 1950s, when the approach was used by the International Institute of Rural Reconstruction in the Philippines (Selenar *et al.,* 1997). Many extension services make use of 'contact' farmers to enhance farmer-to-farmer dissemination. Contact farmers, also called 'lead' or 'master' farmers are selected to liaise between the extension staff and the community, in promoting the adoption of a technology or innovation. They are assumed to be experts in the use of new technologies and excellent disseminators.

In contact farmer's approach, farmers take centre stage in information sharing. It is envisaged that farmer led extension is a more viable method of technology dissemination as it is based on the conviction that farmers can disseminate innovations better than Extension Agents because they have an in depth knowledge of local conditions, culture, practices and are known by other farmers. In addition, they live in the community, speak the same language, use expressions that suit their environment and also instill confidence in their fellow farmers (Weinand, 2002; Sinjaa *et al*., 2004; Mulanda *et al*., 1999). The farmer-to-farmer extension has its origins in Guatemala in the 1970s, spreading to Nicaragua in 1980s, Mexico and Honduras. It is currently practiced widely in many other countries in Latin America, Asia and Africa in different forms (Weinand, 2002). The contact farmer approach emerged as a reaction to the top down transfer of technology model that left very little possibility for farmers' participation and initiative, did not address farmers' needs, inefficient, biased against well to do farmers and extended inappropriate technologies, leaving behind disinterested farmers and de-motivated extension officers (Nagel, 1997). At the centre of this approach are farmer trainers who are known by many names in different countries and projects.

The declining role of the public extension service created a delivery gap necessitating emergence of new extension services providers (Rivera and Carry, 1998; Swanson and Samy, 2002). Major advances in farm technologies, communication systems and emerging global agricultural markets have created opportunities for improving the quality of life of farmers in developing countries. As Rola *et al*. (2002) contend, a major issue with these, however, concerns the effective and efficient delivery of the knowledge and information on these new advances and markets to dispersed farmers so that they can capitalize on these developments. Yet, it is increasingly acknowledged that public extension services in developing countries are no longer able to meet the changing needs of farmers. Agricultural extension has undergone a number of transformations from regulatory through advisory, Train and Visit, participatory, and now agricultural services under contract extension systems. Despite the transformation, extension is still faced with many challenges. These have been attributed to by a number of factors including understaffing and a poorly motivated staff, low budgetary allocation, lack of relevant technology, top-down planning, centralized management, a tendency to treat all farmers and their contexts as homogenous. The farmer-to-farmer approach focuses on farmers as the principle agents of change in their communities and therefore enhances their learning, and empowerment, thereby, increasing their capacity to adapt/innovate and train other farmers. The role of Extension Officers is also changing from agents of technical messages to facilitators. Although this approach has been operational in Nigeria for decades, the effectiveness of farmer trainers has not been evaluated

Recent innovations in cassava breeding have enabled new varieties to be released to address food inadequacy in Nigeria. In close collaboration with Harvest Plus, IITA and NRCRI recently released six new bio fortified yellow cassava varieties that are conventionally bred to have high beta-carotene content (TMS 01/1371, TMS01/1412, TMS 01/1368, TMS 07/593, TMS 07/539, NR 07/0220) as a strategy to address vitamin. In view of this, the study assessed the effectiveness of contact farmers to effectively disseminate improved technologies/information in the light of their socio-economic characteristics. It identified the improved cassava technologies transferred to non-contact fanners, and estimate the relationship between the socio-economic characteristics of the contact farmers and their effectiveness to transfer improved technology.

Methodology

This study was carried out in Imo State. Imo State has a population of 3,934,899, total area of 5,530km^2, and a population density of 710 persons per square kilometer (NPC 2007). The population is predominantly rural. The State lies within latitudes 4^0 45'N and 7^0 15'N, and longitude 6^0 50'E and 7^0 25'E, and occupies the area between the lower River Niger and the upper and middle Imo River. Imo State is bounded on the east by Abia State, on the west by the River Niger and Delta State, and on the north by Anambra State, while Rivers State lies to the south. Agriculture is the major occupation of the people. The major food produce include; cassava, yam, cocoyam, maize, and melon. Cash crops produced in Imo State include oil palm and rubber. Economic trees like the iroko, mahogany, obeche, gmelina, bamboo, rubber and oil palm predominate. But due to high population density, most of the State has been so farmed and degraded that the original vegetation has disappeared. Thus farmers are forced into marginal lands, a situation aggravated by the rising demand for fuel wood. Deforestation has triggered off acute soil erosion, especially in the Okigwe and Orlu axis. The State is also endowed with mineral resources such as petroleum, kaolin, limestone etc. Imo State is made up of 27 Local Government Areas (LGAs) and three senatorial zones; Okigwe, Owerri and Orlu. Purposive and random sampling techniques were used. The first is the purposive selection of the Owerri Zone of Imo State Nigeria, because of the proximity and relevance of the zone in cassava production. Three (3) Local Government Areas (LGAs) were randomly selected from Owerri zone. Then two rural communities were randomly selected in each of the selected LGAs and 120 respondents selected from each of the rural communities which were made up of 5 contact farmers and 15 non-contact farmers giving a sample size of 120 respondents. Primary data were collected using semi-structured questionnaire. Two separate structured questionnaires were administered on the respondents. The first one elicited information from contact farmers on their self-evaluation of their effectiveness. The second questionnaire administered to non-contact farmers and requested them to assess contact farmers effectiveness. Effectiveness was measured through constructs like message timeliness, message accuracy, message clarity. Effectiveness was categorized as follows: ineffective effective, highly effective. All the objectives were achieved using simple descriptive statistics such as percentages, frequencies and means, while the hypotheses were achieved using inferential statistics (Pearson Product Moment Correlation analysis).

Results and Discussion

Socioeconomic Characteristics of the Respondents

From the findings, it is obvious that farming has been left in the hands of the aged as most of the respondents were within the age range of 50 and 69 years for non-contact farmers and 40 and 69 years for contact farmers. Young able bodied men and women who are vibrant and energetic are no longer interested in farming and this explains why most countries are food unsecured. Farming is left for the aged, mostly practiced as a part time venture. This implies reduced productivity, hunger, and malnutrition and food insecurity in the area. All the contact farmers have had one form of education or the other. Many (57%) attained secondary education. The result also revealed that almost all the farmers had at least primary education. About 42% and 25.5% of the farmers had secondary and tertiary education respectively. This result implies that contact farmers are local leaders with high socio-economic status and have more comparative advantage compared to non contact farmers. This indicates that, over-all, most of the farmers were literate and thus in a better position to be knowledgeable about their experiences on improved technologies of cassava and how it might affect the standard of living and food security of their households. This underscores a rising level of consciousness among farmers in the study area. Nevertheless, the prevailing high level of literacy among yam farmers in the study area suggests that farming households in the area may likely have a good standard of living. This finding is consistent with the findings of Halam *et al*. (2017), from their study on "the role of education and income in determining standard of living and food security". Their study established a significant positive relationship between level of education and standard of living and food security, which simply implies that the level of education of household heads is significant to achieving good standard of living and food security. The findings revealed high respondents' farming experience. It suggests that a higher proportion of the respondents are within the highly experienced range of 11 – 20 (37% and 43.3) years, and 21 – 30 (30% and 24.5%) years of experience for contact farmers and farmers respectively. Hence the farmers are highly experienced or have been in farming most of their lives - both contact and non-contact farmers. Over-all, the result shows that, the sampled farmers had several years of farming experience, which, when combined with their formal knowledge, as shown in the results on educational qualification, would avail them the cognitive still needed to make critical assessment of their production activities, what to adopt and not to adopt and their implications for the standard of living and food security of their households.

Effectiveness of Transfer of Improved Cassava Technologies between Contact and Non Contact Farmers

Table 2 shows that majority of the non-contact farmers rated the contact farmers as effective (65%), 27% rated highly effective, while lower percentage (8%) rated ineffective and highly ineffective. On the other hand, majority (63%) of the contact farmers rated themselves highly effective. This could be due to the satisfaction from their activities so far. Considering the responses of the non-contact farmers, about 92% noted that contact farmers are effective in transferring improved cassava technologies, which implies that the contact farmers are efficient in transferring improved agricultural technologies to other farmers in the area. This also implies the effectiveness of extension personnel in the area. By the use of contact farmers as a means of diffusion of extension messages, it is expected that noncontact farmers will be more receptive to agricultural innovations as barriers imposed by differences in social and cultural background of the extension agents and farmers are curtailed. This is in consonant with Adefuye and Adedoyin (1993) who indicated that the use of contact farmers would facilitate the diffusion of innovation; creating a multiplier effects on the total number of farmers reached. This implies that more farmers will know about agricultural innovations; thereby improve their productivity through the use of such innovations. The effectiveness of contact farmers can be used to assess the effectiveness of extension personnel in conducting its activities and can be used to assess success of extension programme. This is because if appropriate teaching/learning situation is provided, it follows that learning or relatively permanent and positive change in behavior of the farmer would take place. Such teaching/learning situations are effectiveness indicators (Misra, 1997).

The result of the Pearson Product Moment Correlation analysis on Table 4 shows that there is no positive relationship between the age of the contact farmers their effectiveness ($r=-0.3243$: $p=0.05$). It revealed an inverse relationship which means that as the age of the contact farmer increases, his/her effectiveness is reduced. Therefore the null hypothesis that there is no significant relationship between the age and effectiveness of contact farmers is accepted and the alternative rejected. The result also revealed a significant relationship between education and effectiveness of contact farmers in transferring improved cassava technologies to non-contact farmers ($r = 0.4218$: $p = 0.05$) with critical r-value as 0.3407. The result shows a positive relationship between educational level and effectiveness which implies that an increase in educational level of the contact farmers will lead to increase in their effectiveness. The table further reveals that there is a significant relationship between farming experience and effectiveness of contact 'farmers in transferring improved cassava technologies to non-contact farmers ($r = 0.3995$: $p = 0.05$) and critical r-value of 0.3407. This implies that an increase in years of farming experience of the contact farmers will lead to increase in their effectiveness

Conclusion

Evaluation of success or failure of extension programmes cannot be properly done without assessing the effectiveness of the delivery process. A number of variables influence the adoption of agricultural extension recommendations by farmers, and one of such variables is effectiveness of extension delivery. When adoption is low, it should not always be attributed to farmers unwillingness to adopt as poor extension delivery mechanism, cost, usability social desirability, sustainability of innovation, among other variables may lead to non- adoption. A key factor in the adoption process is how well extension activities are organized and delivered. If adequate delivery activities are conducted with adequate materials and personnel, then we can expect high adoption, while low adoption should be expected if the contrary is the case. This study therefore assessed the effectiveness of the contact farmer extension delivery approach. The adoption of contact farmer strategy is undoubtedly a worthy decision given the empirical evidence from this study which investigated the .effectiveness of contact farmer in transferring improved cassava technologies to non-contact farmers in Imo state, Nigeria. The study therefore recommends training and agricultural education for the contact farmers.

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Table 1: Socioeconomic characteristics of the Respondents

Variables	**Contact farmers N=30**	**Non-contact farmers N=90**	**Total N=120**
Age			
30-39	3 (10)	11(12.2)	14 (11.6)
40-49	9 (30)	17 (18.9)	26 (21.7)
50-59	11(36.7)	21 (23.3)	32 (26.7)
60-69	6 (20)	32 (35.6)	38 (31.7)
70 and above	1 (3.3)	9 (10)	10 (8.3)
Educational Level			
None		5 (5.5)	5 (4)
Primary	4 (13)	24(27)	28 (23)
Secondary	17 (57)	38 (42)	55 (46)
Tertiary	9 (30)	23 (25.5)	32 (27)
Farming experience (years)			
1-10	6 (20)	18 (20)	
11-20	11 (37)	39 (43.3)	
21-30	9 (30)	22 (24.5)	
31 and above	*4 (13)*	*11 (12.2)*	

Source: Field survey, 2020

Table 2: Effectiveness Score of Contact Farmers

Effectiveness	Contact farmers N=30	Non contact farmers N=90	Total N=120
Highly ineffective	-	7 (8)	7 (6)
Effective	11 (37)	59 (65)	70 (58)
Highly effective	19 (63)	24 (27)	43 (36)

Source: Field survey, 2020

Table 3: Relationship between socioeconomic characteristics and effectiveness of contact farmers

Socioeconomic factors	r-calc	r-critical	D.f (N-2)	Level of Significance	Decision
Age	– 0.3243	0.3407	28	.5	Accept Ho
Educational level	0.4218	0.3407	28	0.05	Reject Ho
Farming experience	0.3995	0.3407	28	0.05	Reject Ho