P-ISSN: 2305-6622; E-ISSN: 2306-3599
International Journal of
Agriculture and Biosciences
www.ijagbio.com; editor@ijagbio.com

Research Article

Determination of Technology Adoption Behaviour of Contact and Non-Contact Famers in Owerri Agricultural Zone of Imo State, Nigeria

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Article History: Received: January 12, 2018 Revised: March 18, 2018 Accepted: April 14, 2018

ABSTRACT

The study was on technology adoption behaviour of Contact and non-contact farmers in Owerri Agricultural zone of Imo State. The paper examined contact and non-contact farmers adoption behaviour, ascertained the most adopted crop-based technologies, identified problems encountered by non-contact farmers in adopting improved technologies disseminated by contact famers, and estimated the relationship between non-contact farmers adoption of improved technologies and frequency of contact with famers. Fifty (50) contact and non-contact famers were selected through multi-stage random sampling technique. Primary data were collected using structured questionnaire and analysed using percentage, mean statistic and Pearson Product Moment Correlation (PPMC). Results showed differences in adoption behaviour of both contact and non-contact famers. While the contact famers had the overall mean of 1.82 indicating positive adoption behaviour, the non-contact farmers had the overall mean of 1.34 indicating negative adoption behaviour. Results further showed that with the overall mean of 1.81, technologies were adjudged as accepted and adopted by farmers. Correlation coefficient of 0.104 between adoption by non-contact farmers and frequency of visit by contact famer was low showing that the degree of association between them was only 10% and not statistically significant. The study concluded that non-contact farmers be exposed adequately along with their contact farmer counterpart in matter concerning dissemination of improved technologies to ensure better adoption behaviour of all.

Key words: Adoption Behaviour, Contact Farmer, Non-contact Farmers, Technology.

INTRODUCTION

The overall objective of agricultural research is development of improved technologies for sustainable increase in agricultural production with increasing efficiency while enhancing the revenue based as much as possible (Amalu, 1998). Technology developed must be disseminated or transferred before adoption, hence Akubuilo et al (2007) and Olumba and Rahji (2014) stated that adoption is a decision made by individual or group to use an innovation in a continuous manner. Disseminating or transferring a technology has to do with creating awareness about the technology and let the target audience or end user have valid and up-to-date information on the technology with respect to its applicability to their farming system and receive technical assistance necessary for its adoption (Asiabaka et al, 2001). Provision of up-to-date information and technical assistance to farmers (Contact farmers) who then diffuse them to Non-contact farmers (NCF) is the sole responsibility of the Extension Agents (EAs). But the inadequacies of the EAs have necessitated the use of Contact farmer (C.F.) in transfer of improved technology to users.

Contact Farmers (C.F.) are farmers formally selected and regularly trained by EAs in the use of proven technologies in the hope of sharing their experiences with other farmers (Khaula et al, 2015). In effect, C.F. is supposedly a major source of agricultural information to NCF (Lenoir, 2009). The regular training of the C.F. by the EAs exposed them to better perception about innovations than the NCF (Chukwu, 2015). Most often, information to NCF are not original and could lead to different perception about a technology. Chukwu and Nwaiwu (2013) are of the view that different perception about a technology influence the behaviour of possible adopters. Obidiegwu (2016) posited that methods used in disseminating improved technologies also influence

Cite This Article as: Chukwu AO, 2018. Determination of technology Adoption behaviour of contact and non-contact famers in Owerri Agricultural Zone of Imo State, Nigeria. Inter J Agri Biosci, 7(1): 47-50. www.ijagbio.com

adoption behaviour of end users. The author explained further that EAs may apply method(s) different from what the C.F. uses and this tells much on the understanding of the technology hence affecting adoption of the said technology. Maskus (2003) opined that determining effective methods of disseminating improved technology is pertinent. Effective methods creates positive and clear picture about a given technology and hence improves adoption behaviour of the users.

Agricultural technologies could be livestock-based or Crop-based. In this study, emphasis is on Crop-based. Technologies such as; Yam minisett production, Cassava/Maize/Egusi intercrop, Yam/Cassava/Maize/ Egusi alternate row arrangement, etc. C.F. and N.C.F. knowledge about these technologies influences their behaviour in adopting them. Other factors may include social and economic variables such as status, attitudes, cost of technology, etc.

Specifically, the study:

i) examined adoption behaviour of contact and Non-Contact farmers;
ii) ascertained the most adopted crop-based technologies and why;
iii) identified problems encountered by Non-Contact farmers in adopting improved technologies disseminated by contact farmers;
iv) estimated the relationship between Non-Contact farmers adoption of improve technologies and frequency of contact with contact farmer.

A hypothesis of no significant relationship between Non-Contact farmers adoption of improved technologies and frequency of contact with contact farmers was postulated.

MATERIALS AND METHODS

The study was carried out in Owerri Agricultural Zone of Imo State located in Southeast Zone of Nigeria, and lies between latitude 5° 10'N and 6° 35'N and longitude 6° 35'E and 7° 28'E of Greenwich meridian (Ministry of Lands and Urban Planning, Owerri, 2013). The annual rainfall is between 2000mm and 2,500mm while the mean annual temperature is between 26°C-28°C with a relative humidity of about 98% during the wet season (Imo ADP, 1990). The Zone is richly endowed with fertile land suitable for the growth of arable crops like cassava, maize, egusi, yam, etc. Arable crop intercrop is the main cropping system practice in the Zone and farmers are mainly small holders (Imo ADP, 2000).

A total of fifty (50) C.F. and NCF were selected through multi-stage random sampling technique. Data were collected from both primary and secondary sources, and analysed using percentage, mean statistic and Pearson Product moment correlation (PPMC). Objectives 1 and 2 were realized using mean statistic, while Objective 3 was achieved using percentage. Objective 4 and the hypothesis were realized using the PPMC, implicitly stated as:

$$r = n\sum xy - (\sum x)(\sum y) / \sqrt{n(\sum x^2) - (\sum x)^2} \times \sqrt{n(\sum y^2) - (\sum y)^2}$$

Where: n = the sample size
x = Adoption Rate of improved technologies
y = Frequency of Contact of NCF with CF.

The value r is such that $-1 \leq r \leq +1$. The + and – signs are used for positive and negative Linear Correlations respectively.

RESULTS AND DISCUSSION

Results in Table 1a shows adoption behaviour of contact farmers over various adoption attributes. The attributes were rated agreed and disagreed using two-point Likert scale rating system. Farmers affirmed agreed to all attributes indicating that contact farmers adopted innovation easier, Practiced Small Plot Adoption Technique (SPAT), had higher adoption rate, and were more informed than non-contact farmers. This finding implies positive adoption behaviour which could be as a result of C.F. direct contact with extension personnel who disseminate original or unadulterated information.

Table 1b contains information about adoption behaviour of non-contact famers. Farmers' responses were also categorised agreed and disagreed rated in Likert scale manner. The contact farmers however disagreed on most attributes with overall mean of 1.34 indicating poor or negative adoption behaviour. This could be as a result of gap between them and extension personnel. The contact farmers who are meant to contact them directly may delayed in disseminating information, or hoard relevant information, or disseminated adulterated information.

Table 2 contains information about adoption status of crop-based technologies among farmers. Amongst various technologies disseminated, only late maize/egusi and maize/cassava/cowpea intercrop were not adopted by farmers. The decision to accept as adopted and to reject was based on the discriminatory mean of 1.5 arrived at by Likert scale rating. Findings showed that technologies were adjudged as accepted by farmers having the overall mean of 1.81.

Result in Table 3 contains information on reasons for adoption of various technologies enumerated in Table 1a and b. While farmers disagreed that they failed to adopt the technologies because of its expensive nature and land consumption, they however agreed that they adopted them because of the profitability, resistant to disease and pest, matured easily and high yielding ability. The overall mean of 1.75 was accepted as agreed indicating that in aggregate, the reason for adoption were agreed upon by farmers.

Results in Table 4 showed problems encountered by non-contact farmers in adopting improved technologies disseminated by contact farmers. Farmers agreed on various problems enumerated but at different levels, hence their agreements were ranked. The ranking was based on the pressing problems. Lack of linkage with research institutes was rated the highest (1^{st}) hence adjudged the most pressing problem, while high cost of labour was the lowest ranked (15^{th}). Both Asiabaka (2002), Agbamu (2011), Okoroma and Anaeto (2013) agreed on those Problems as influencing contact farmers adoption of improved technologies. Similarly Nwachukwu (2003) identified poor research and extension linkage, cost of inputs, inadequate training, Land fragmentation, Lack of Storage and processing facilities, Lack of credit and loan facilities, Lack of credit and loan facilities as among factors constraining adoption of improved technologies by non-contact famers.

Table 1a: Respondents Distribution Based on the Adoption Behaviour of contact farmers.

Attributes of contact farmers	Agreed	Disagreed	Total	Mean	Remark
❖ Adopt early than non-contact farmers	46	4	50	1.92	Accept
❖ Look into the attributes of an innovation before adopting it	37	13	50	1.74	Accept
❖ Practice an innovation on SPAT before practicing it on a large scale	44	6	50	1.88	Accept
❖ Younger farmers adopt an innovation than older farmer	39	11	50	1.78	Accept
❖ Adoption rate is higher than in non-contact farmers	48	2	50	1.96	Accept
❖ Cost of production is lower than in non-contact farmers	37	13	50	1.74	Accept
❖ More informed than non-contact farmers	37	13	50	1.74	Accept
Total	288	62	350	1.82	Accept

Source: Field survey, 2017.

Table 1b: Respondents Distribution Based on the Adoption Behaviour of non-contact farmers.

Attributes of non-contact farmers	Agreed	Disagreed	Total	Mean	Remark
❖ Adopt early than contact farmers	2	48	50	1.04	Reject
❖ Look into the attributes of an innovation before adopting it	49	1	50	1.98	Reject
❖ Practice an innovation on SPAT before practicing it on a large scale	0	50	50	1.00	Reject
❖ Younger farmers adopt an innovation than older farmer	9	41	50	1.18	Reject
❖ Adoption rate is higher than in contact farmers	13	37	50	1.26	Reject
❖ Cost of production is lower than in contact farmers	22	28	50	1.44	Reject
❖ More informed than contact farmers	27	23	50	1.54	Reject
Total	122	228	350	1.34	Reject

Source: field survey, 2017.

Table 2: Distribution of respondents based on the most adopted crop-based technology and why it is mostly adopted.

Crop-based Technology	Adopted	Not Adopted	Total	Mean	Remark
❖ Cassava/Maize/Egusi intercrop	50	0	50	2.0	Accept
❖ Yam/Cassava/Maize/Egusi conventional	49	1	50	1.98	Accept
❖ Cassava/Maize/Egusi/Cocoyam	50	0	50	2.0	Accept
❖ Late Maize/Egusi	14	36	50	1.04	Reject
❖ Yam Minisett	48	2	50	1.96	Accept
❖ Maize/Cassava/intercrop	22	28	50	1.44	Reject
❖ Maize/Cassava/Cowpea	45	5	50	1.90	Accept
❖ Swamp rice, line or row planting	46	4	50	1.92	Accept
Total	324	76	50	1.81	Accept

Source: field survey, 2017.

Table 3: Distribution of the respondents based on reasons for adoption of these technologies.

Reason	Agreed	Disagreed	Total	Mean	Remark
❖ They are profitable	45	5	50	1.9	Accept
❖ They are resistant to pest and diseases	46	4	50	1.92	Accept
❖ They are high yielding	44	6	50	1.88	Accept
❖ They are early maturing	47	3	50	1.94	Accept
❖ They are expensive	23	27	50	1.46	Reject
❖ They consume much land	22	28	50	1.44	Reject
Total	227	73	50	1.75	Accept

Source: field survey, 2017.

Table 4: Distribution of non-contact farmers by problems encountered in adopting improved technologies disseminated by contact farmers.

Problems	*Frequency	Percentage	Rank
i. Inexperience of contact farmers	23	23.0	14th
ii. Poor communication skill of contact farmers	33	33.0	11th
iii. Lack of adequate training in different subject matter	54	54.0	4th
iv. Inadequate agricultural information	41	41.0	10th
v. Lack of linkage with research institutes	75	75.0	1st
vi. Weak linkage with extension organization	62	62.0	2nd
vii. Poor access to credit	44	44.0	6th
viii. High cost of inputs	56	56.0	3rd
ix. Inadequate storage and processing facilities	44	44.0	6th
x. Pests and diseases infestation	31	31.0	13th
xi. Poor contact with farmers	42	42.0	9th
xii. High cost of labour	22	22.0	15th
xiii. Unavailability of improved crops/seedlings for demonstration	33	33.0	11th
xiv. Lack of improved livestock breed for demonstration	44	44.0	6th
xv. Limited availability of land to serve as experimental plot	46	46.0	5th

Source: field survey data, 2017; *Multiple response recorded.

Table 5: Correlation Coefficient of Adoption of Improved Agric. Technologies by Non-Contact Farmers and Frequency of Contact (visit) by Contact Farmers to Non-Contact Farmers.

	Adoption by non-contact farmers:	Contact farmers visit
Adoption by non-contact farmers:		
Pearson Correlation	1	0.104
Sig (2-tailed)		0.472
N	50	50
Contact farmers visit:		
Pearson Correlation	0.104	1
Sig (2-tailed)		0.472
N	50	50

Source: Field survey, 2017.

Results in Table 5 showed correlation coefficient of Adoption of improved technologies by non-contact farmers and frequency of contact by contact farmers to non-contact farmers. Findings indicates positive correlation between adoption of improved technologies among NCF and frequency of contact by CF to NCF. This shows that as frequency of contact increases, adoption of technologies increases. However, correlation coefficient of 0.104 between adoption by non-contact farmers and frequency of contact by C.F. was low hence the degree of association between them was only 10% and was not statistically significant.

Conclusion

There was strong indication that contact farmers have better adoption behaviour than the non-contact farmers. Continuation of this will jeopardize effort to achieve self-sufficiency in food production, hence there is need to bridge the gap between CF and NCF contact with extension personnel in matters concerning improved technology dissemination.

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