Journal of Biology, Agriculture and Healthcare
ISSN 2224-3208 (Paper) ISSN 2225-093X (Online)
Vol.7, No.12, 2017

Application of Agricultural Extension Principles to Information Dissemination among Extension Workers in Delta State, Nigeria: Implications for Urban Agriculture

D.U. Okoedo-Okojie C.O. Edeoghon
Department of Agricultural Economics and Extension Services, Faculty of Agriculture, University of Benin, P.M.B 1154, Benin City, Nigeria

Abstract
The study identified the various channels used for information dissemination among researchers and determined the level of application of extension principles to extension works among urban farmers in Delta State. About 120 extension workers were purposively selected from the two research institutes in the State with the use of structured questionnaire. Data collected were analyzed with the Logistic Regression. Results showed that about 60.0% of the extension workers had their background in extension discipline while the remaining 40% were Subject Matter Specialists (SMS). Among the numerous channels available for information dissemination, only farm visit was regularly used and extension principles based on needs ($\overline{X}$=3.28, SD=0.85) and Proffering solutions to farmers problems ($\overline{X}$=3.08, SD=0.98) were commonly practiced. Age (t=2.169; p≤0.05), education (t=1.709;p≤0.05) and rank (t=3.995;p≤0.01) significantly determined frequency of application of extension principles in the study area. It was concluded that extension workers in the State demonstrated professionalism in the discharge of their duties considering the adoption of the two basic principles of working with the farmers to solve their problems and needs oriented approach. It is recommended that extension workers should be more focused on urban farming especially if the current food crisis is to be ameliorated in Nigeria.
Keywords: Information, urban farming, principles, agricultural extension

Introduction

Agricultural extension workers are trained personnel who are responsible for transferring of information and technology to both rural and urban farmers. They play other numerous roles and responsibilities like helping farmers develop practical application of research knowledge in improving their livelihoods, home management, community development activities and group formation (Oladele, 2016). In carrying out these responsibilities, certain principles are usually applied. Agricultural extension principles are laws and rules discoursed by extension workers or researcher and proven by years of experience that now serve as guidelines for extension workers as stated by (Akinbile *et al.*, 2006).

One interesting thing about extension principles is the fact that they focus on the workers with a view to empowering themselves to be able to solve and meet the needs of their clienteles (Jobowo, 1992, FAO, 2014). Chromal (2016) gave the list of principles that an extension worker must imbibe and internalize for smooth and efficient extension delivery. Such principles are: extension work must be based on the needs and interest of the people, extension work should be based on the knowledge, skills, belief and value of the people, extension encourages people to take action and work out their own solution to their problem, rather than receiving ready-made solution, an extension programme should be flexible so that necessary changes can be made whenever needed, to meet the varying conditions and need of the people, extension work should based on full utilization of local leadership, extension should be a co-operative action involving participating activity in which people co-operate to pursue a common goal. In addition, extension should be based on constant evaluation and the effectiveness of extension work is measured in terms of the changes brought in knowledge, skills and attitude and the adoption of change behavior of the people.

The activity of agricultural extension in Nigeria is an age long one. According to Enwere and Madukwe (2001), the beginning of recognizable agricultural extension practice in Nigeria started in 1954 with the establishment of three regional ministries of agriculture. One in the East, and West, this was sixty years after the establishment of a botanical research station in Lagos in 1893. Following this development, the posts of Director and Inspector-General of Agriculture in each region created in 1951 were abolished. Each Regional Ministry of Agriculture and a Field Service Division of the extension personnel trained by the school working under the field service division were deployed to teach farmers innovative farming techniques. The federal department of agricultural research was retained, while extension work remained a regional responsibility (Hall *et al.*, 2004).

The research findings of the federal research stations under this arrangement were to be transmitted through regional ministries responsible for agriculture and natural resources. The regionalization of agriculture and the consequent separation of research and extension reduced the focus on extension and laid the basis for the

enduring weak linkage between research and extension. The official farm policy, even after independence concentrated attention on export commodities in the belief that food production activities (which bordered on the indigenous knowledge and welfare of the farmers) could take care of themselves without any governmental intervention. The agricultural practice of the regional government aimed at the modification of traditional farming method (Ozor and Madukwe, 2001). This was due to the weak capacity inherent in traditional practice to produce food to meet the needs of the rising population and urbanization.

Center for Technical Agriculture (CTA, 2005) noted that success or failure in economic development can be measured by a nation's success or failure in making rules and regulations for agricultural knowledge generation and transfer. These regulations are usually derived from principles. Akinbile *et al*., 2006) opined that principles are the fundamental laws and rules discovered by educational researches and proven by years of experience that now serve as guide line for educational endeavors which necessary for an extension worker. Ladele (2016) submitted that the term extension is derived from educational concept in England. Thus, there is a strong linkage existing between extension and education.

However, the historical trajectory of agricultural extension is rooted in the rural areas. It is an out of school system of adult education designed to meet rural peoples' needs and improving their livelihood (Kelsey and Hearne, 1966). The recent adoption of urban farming in developing countries has not been empirically researched into whether extension services have been shifted towards the group of farmers who are engaging in urban farming. For the poor, urban agriculture provides economic benefits as people can now consume foods produced closer to home, hence reducing the additional costs that transportation from distant rural farms imparts on food prices (FAO, 2003). Therefore, it will be interesting if the principles of extension services are applied in disseminating useful information to urban farmers in Delta State, considering the level of urbanization and presence of two critical agricultural research institutes in the region. Hence, the study was conducted assess how extension workers in Delta State apply the principles of agricultural extension in the discharge of their responsibilities. Specifically, the study identified the various channels used for information dissemination among researchers and determined the level of application of extension principles.

Methodology

Delta state has a total population of 4,098,291 with a total land area of 17,698 square kilometre which has about 60% land. The State has a population density of 232 inhabitants per square kilometre with an annual growth rate of 3.28% (National Population Census, 2006). The State lies approximately between latitude 5^0 and 6^0, 3^0 North and longitude 5^0 and 6^0, 45^1 East. The State is made up of 25 local government areas with institutes of Marine study and Oceanography Research; Nigeria Store Products Research Institute and Songhai Integrated Farms as research institutes.

Okpe and Sapale Local Government Areas were purposively selected due to the presence of Institute of Marine Study and Oceanography Research and Nigeria Store Product Research Institute. In the two institutes, all available agricultural extension workers were used for the study. At the end, 54 and 66 respondents were sampled and interviewed in Institute of Marine Study and Oceanography Research and Nigeria Store Product Research Institute, respectively. Thus, 120 respondents were used for the study. Data were collected with the use of structured questionnaire and analyzed using logistic regression to examine the determinants of frequency of application of principles of agricultural extension by extension workers among urban farmers while frequency counts, percentage and mean were used to describe the data.

Results and Discussion

Evidence in Table 1 showed that majority (56.7%) extension workers had working experience of between 6 and l0 years, with a mean of 8 years. This implies that they are expected to have knowledge of agricultural extension principles considering the length of stay in service. Thus, using the principles of extension to reach the farmers will mean that farmers in the areas will be richly informed based on Crouch (1981) assertions that extension is an informal out of school education process directed towards the rural population with a view to improving their standard of living and creating alternatives for living. The fact that urban farming is gaining popularity in Nigeria, extension services reaching them should be directed towards these groups of people considering their contribution to food security (Idachaba, 2006). High working experience recorded by the extension workers in the study area is expected to be helpful in performing their task of introducing extension services to urban farmers.

Similarly, a higher proportion (46.7%) had less than 5 years of training in extension work. This implies that most of the extension workers in the study area did not have enough extension training. This could have negative consequences on adoption of extension principles as these are very crucial to effective extension delivery. This finding conforms to the assertions of Torimiro and Akinyemiju (2004) that over 60% of extension workers in Ondo and Osun States never had their education background in extension discipline but other disciplines in the field of agriculture. This may be unconnected with the fact that Madukwe and Obibuaku (1991)

reported that extension was a very small unit in the administrative machinery of the Ministry of Agriculture not until the establishment of Agricultural Development Programme (ADP) in the 1980s.

Also, a higher proportion (45.0%) of the extension workers in the study area do not have means of transport. This means that mobility would be a major problem to extension works and extension workers may not find it easy to move from locations to the others especially in urban centers with high attendant of high cost of transportation. This could pose difficulties in the discharge of their work as reported by Hall *et al.* (2004) that the roles of transferring and disseminating agriculture technologies in the Ministry were bugged with staff immobility and financial hindrance.

Concerning the areas of training received by the extension workers, about 30.8% had their training in general agriculture while majority (60.0%) had their training in the field of agricultural extension and rural development. Others areas of specialization in the field of agriculture were also represented in extension works. This implies that all categories of farmers are likely informed, and may lead to an increase in Agricultural Productivity. This reflects FAO (1992) that extension services is for training and influencing farmers to adopt improved practice in crop and livestock production, conservation, management and marketing. This result is expected as OND in general agriculture is the minimum qualification for recruiting staff (extension agents) into ADPs in Nigeria. The findings support the finding of Enwere and Madukwe (2001) who reported that extension workers within extension organization comprise of both field workers and subject matter specialists (SMS).

Furthermore, majority (67.5%) of were permanent staff with only few of the staff are on temporary and contract positions. The fact that most of them are permanent staff may also enhance their performance at works and encourage them to imbibe and internalize the principles of extension in the discharge of their duties. In the same vein, majority (50.0%) were field staff while 49.2% were mainly office attendants. This is an indication that respondents in contact with farmers were mainly field workers. Therefore, farmers will be regularly updated especially since there will be close proximity between these research institutes and the urban farmers in the study areas. The result also showed a deficit in field staff as a higher proportion were office attendants, a situation that could make many farmers not properly covered for extension process and practice. This reflects Ladele (2016) that practice is the act of rehearsing a behavior over and over or engaging in activities again and again.

Table 1: Distribution of respondents based on their selected socio-economic characteristics

Variables		Freq	%	Mean
Working experience	5 & below	8	6.7	8.0
	6-10s	68	56.7	
	11-15	26	21.7	
	>15	18	15.0	
Years of training in (extension work)	5 & below	56	46.7	8.0
	6-10	46	38.3	
	11-15	18	15.0	
	>15	0	0	
	Motorcycle	18	15.0	
Mobility for ext. work	Official vehicle Bicycle None	48 0 54	40.0 0 45.0	
Training background	Crop sc.	37	30.8	
	Animal sc.	17	14.2	
	Fishery	1	0.8	
	Forestry/wildlife Agric. Ext. Agric. Econs	0 14 20	0 11.7 16.7	
	Others		2.5	
	General agric	28	23.3	
	Extension agents	72	60.0	
	BEA	47	39.2	
Rank	ZEO	1	0.8	
	CEO	0	0	
	Temporary	21	17.5	
	Permanent	81	67.5	
Working status	Seconded	10	8.3	
	Contract	8	6.7	
	Field worker	59	49.2	
Job	Office attendant	60	50.0	
Responsibilities	Field assistant	1	0.8	

Source: Computed from Field Data, 2016

Channels used for disseminating information to urban farmers

Table 2 showed that in all the available channels of information, only farm visit ($\overline{X}$=2.68±1.38) had the high usage in disseminating information to urban farners on the application of extension principles. Hence, farm visit, home visit and group discussion were ranked 1st, 2nd and 3rd in their usage. This is an indication that a weak extension linkage exists between urban farmers and agricultural extension workers in the study area. This may not be unconnected to the fact that extension activities in most developing countries are rural based owing to the fact that over 70% of food consume in urban centres are produced in the rural areas (World Bank, 2015). However, there is a paradigm shift in this belief as many urban farmers exist in urban areas more than ever before. Incidence of food insecurity that has enveloped many of these African countries may be responsible for the spread of farmers to the urban centre because it has been documented that food insecurity is prevalence in urban centres compared to the rural areas (Idachaba, 2006).

Similarly, the weak extension contacts between urban farmers and extension workers may be due to the ratio of farmers-extension contacts in most developing countries are very low compared to the recommended standards by the World Bank. This corroborates the report of Sulaiman and Van den Ban (2003) that farmers are at the end of the information chain, with little opportunity to provide feed-back due to low number of extension staff. Thus, communicating information directly to a large number of farmers is difficult.

Table 2: Channels used for disseminating information to urban farmers

Information channels	Mean	SD	Rank
Farm visit	2.68*	1.38	1
Home visit	2.28	1.26	2
Monthly review meeting	2.15	1.4	4
Group discussion	2.21	1.33	3
Forth night training	2.12	1.43	6
Agricultural programs	2.13	1.22	5
Workshops	1.97	1.24	7
Journals	1.73	1.27	13
Seminars	1.95	1.22	8
Interview"	1.88	1.22	9
Conference	1.82	1.27	10
Posters	1.73	1.21	13
Extension films	1.8	1.17	11
Computer	1.67	1.11	15
Newspaper	1.68	1.05	14
Magazines	1.58	1.01	19
Circular letter	1.62	0.90	17
Printed media	1.62	1.15	17
Radio	1.61	0.92	18
Television	1.48	0.85	20
Audio cassette	1.4	0.64	21
Recorded video	1.33	0.62	22

**High usage= (mean > 2.50)* Source: Survey Field, Data

Frequency of applying agricultural extension principles

Results in Table 3 showed that most frequently applied agricultural extension principle by extension workers were the principles based on farmers' needs and problems solving ($\overline{X}$ =3.28, SD=0.85)"; Proffering solutions to farmers problems ($\overline{X}$ =3.08, SD=0.98); Considering farmers' education capability in communicating messages to them ($\overline{X}$ =2.92, SD=1.16); the use of local dialect/understandable language in communicating with clientele ($\overline{X}$ =2.71, SD=T.31); asking for feedback from farmers based on extension messages disseminated to them in a gradual manner ($\overline{X}$ =2.52, SD=1.12). This suggests that extension workers frequently applied basic and most important principles of agricultural extension in carrying out their responsibilities despite the fact that this study had proved that they are limited in number and almost about 40% of them did not have their background in agricultural extension as a discipline coupled with the fact that rural areas area the target of extension services. This situation no doubt is likely to generate success in the study area as Akinbile *et al.* (2006) noted that principles are fundamental laws and rules discovered by educational research and proven by years of experience that now serve as guide for education endeavours which is necessary for extension works. Also the result is an indication that respondents are frequently well guided in the dispatch of their duties as development workers which will lead to economically successful farming as noted by Ladele (2016) and Idachaba (2006) respectively that principles are statement of policy to guide decisions and actions in a consistent manner because they are universal truths that have been observed and found to be truth and a settled rule for action.

Table 3: Frequency of applying agric extension principles

Principles	Mean	SD	Rank
Base your work on farmer's needs/problems	3.28	0.85	1
Proffer solutions to farmers problem	3.08	0.98	2
Based extension work on farmers' understanding	2.94	1.23	3
Consider farmers education capacity in communicating	2.92	1.16	4
Use local dialect understandable language in communicating	2.71	1.31	5
Asking for feedback from farmers	2.63	1.21	7.5
Communication extension message to farmers in a gradual manner	2.52	1.12	12
Persuade farmers to participate in extension programme	2.57	1.17	10
Plan programmes for farmers	2.42	1.11	13
Farmers to ask encourage question	2.63	1.35	7.5
Consult with members of the local community	2.38	1.26	14
Speaking skill	2.7	1.00	6
Find out from farmers the communication channel they prefer	2.37	1.16	15
Listening skill	2.54	1.03	11
Use of local leaders to disseminate information	2.23	1.25	16.5
Communication setting	2.6	2.89	9
Work with all members of the rural family	2.23	1.23	16.5
Involve farmers in evaluating extension programme	2.19	1.16	18

**High application= (mean > 2.50)*
Source: Compiled from Field survey data, 2016.

Determinants of application of agricultural extension principles among extension workers

Results of the logit regression analysis on determinants of extension workers frequency of applying agricultural extension principles in interacting and disseminating information to urban farmers were presented in Table 4. It was revealed that education (b=0.340), age (b=0.527) and rank of extension workers (b=1.522) were the identified significant determinants of the frequency of application of extension principles in agricultural extension works in the study area.

The findings showed that age, education level and rank had significant effect on extension workers' frequency of application of agricultural extension principles. These variables were able to explain about 17.4% of the variation in extension workers application of extension principles on their job with the Pseudo R-square value of 0.174. The likelihood ratio model Chi-square (χ^2 =27.75) shows that the three significant explanatory variables were jointly significant at 5% critical Chi-square of (χ^2 =55.12). The co-efficient for education (b=0.340) implies that a positive relationship existed between extension workers educational level and their application of agricultural extension principles on their job at 10% level of significance (t=1.709, P<0.10). The odd ratio of 1.405 suggests that extension workers that are more educated are about one and half (1 ½) times more likely to apply agricultural extension principles more frequently on their job than those with lesser educational status.

Similarly, the co-efficient for age (b=0.527) implies that a positive relationship existed between extension workers' age and their frequency of application of agricultural extension principles on their job at 5% level of significance (t-2.169, p<0.05). The odd ratio (1.694) suggests that older extension workers apply extension principles one two third ($1\frac{2}{3}$) times more frequently on their job than younger extension workers. In addition, co-efficient for rant (b=1.552) implies that a positive relationship exist between extension workers rank and their job frequency of application of agricultural extension principles on their job at 1% level of significance (t=3.955. p<0.01). The odd ration (4.581) suggest that extension workers with higher rank are about found and half (4 ½) times more likely to apply agricultural extension principles more frequently on the job than extension agents with lower rank. This level of relationship is expected because rank show how good or important a person is on the job.

These results are in consonant with the findings of Teichler (1999) and Abas-Mastura *et al.* (2013) that reported the significant of education and skills that comes with age and length of stay on a job to performance. This study reveals that these significant variables must be critically put into consideration when workers' skills and competence are to be examined.

Table 4: Determinants of extension workers skills in extension principles

Variables	Co-efficient	t- value	Odd ratio	Prob. Level
Constant	4.757	3.173	116.396	0.002
Age	0.527	2.169	1.694	0.030
Sex	-0.002	-0.005	0.998	0.996
Education (years)	0.34	1.709	1.405	0.047
Working experience	-0.389	-1.473	0.678	0.141
Years of training	0.265	1.373	1.303	0.170
Rank	1.522	3.995	4.581	0.001

Likehood ratio Chi-square= 27.75; df= 6; $p \leq 0.001$
Goodness of fit Chisquare= 55.12; df= 67; $p \leq 0.050$
Pseudo R-square = 0.174
Source: Compiled from Field survey data, 2016.

Conclusion

The importance of agricultural extension cannot be overemphasized in information dissemination among farmers and the practice of urban farming in developing country like Nigeria may require effective and efficient agricultural extension system where professionalism is demonstrated in carrying out extension works. Therefore, agricultural extension principles will have to be imbibed by those carrying out extension works. The study however, found that a weak extension system existed between urban farmers and extension workers in the study area because only farm visits recorded high level of practice among the numerous channels of communication identified. Beyond this, extension workers demonstrated some level of professionalism from the principles of needs and problem solving that had high frequencies among the others principles identified and they were ranked 1st and 2nd. The findings also established that age, education and extension workers' ranks were very crucial to the application of extension principles in the discharge of their responsibilities as extension workers. It is therefore concluded that positive relationships existed between these variables and extension workers' skills in discharging their duties as change agents.

References

Abas-Mastura, M; Imam, O. A and Osman, S (2013). Employability skills and task performamance of employees in government sector. International Journal of Humanities and Social Sceinec, 3(41):150-162

Akinbile, L. A, Akinwale, J. A and Ashimolowo, O. R (2006): Determinants of Productivity Level among Rice Farmers in Obafemi-Owode LGA, Ogun State, Nigeria. *Journal of New Seeds*, Vol. 8, No. 4, 79-90. (USA) (50% Contribution).

CTA (2005). Methodological Framework Analyzing the Agricultural Science Technology and Innovation (ASTI) Systems in ACP Countries CTA/UNU51 INTECH/KIT.pp10

Enwere, N. J and Madukwe, M. C (2001). Private and public sector participation in the development of learning and linkage capabilities of the baking industry in south-eastern Nigeria. Proceedings of the 7th Annual Conference of Agricultural Extension Society of Nigeria, held at Bauchi, pp 42-52.

FAO (2014) Understanding extension. Corporate document repository. Pp. 13

Food and Agricultural Organisation (2003). Statistical Data base of Food and Agricultural Organization of the United Nations, Rome, Italy. http//faosta.fao.org

Hall, A. J.; Mytelka, L and Oyeyinka, B. (2004). Innovation systems: Concepts and implications for agricultural research policy and practice. Maastricht: United Nations University.

Idachaba, F. S. (2006). *Strategic and Policies for Food Security and Economic Development in Nigeria.* Lagos: CBN

Jibowo, A.A (1992) Essentials of Rural Sociology. Abeokuta, Gbemi Sodipo Press Ltd. Pg. 29

Kelsey, L. D and Hearne, C. C (1966). Cooperative extension work. 3rd Edition. Cosostock Publishing Associates, Ithaca, New York. Vol. 33: 12-18.

Ladele, A. A (2016). Extension everywhere, extending nowhere: The cacophony of Agricultural Extension in Nigeria. An inaugural Lecture, 2015/2016, University of Ibadan. Pg. 11.

Madukwe, M.C. and Obibuaku, L.O. (1991).Influence of organizational structure on the effectiveness of agricultural extension supervisors in Anambra State, Nigeria. *Nigerian Development Journal,* Vol. 1,(1) pp.13-25.

Ozor N and Madukwe, M. C (2001) Extension professional perception of privatization and commercialization of agricultural extension service in Enugu State Agricultural development Programme. Journal of Agricultural Extension, 5: 67-75.

Sulaiman, R and A.W. van den Ban (2003). Funding and delivering agricultural extension in India. *Journal of*

International Agricultural and Extension Education 10(1): 21–30.

Techler, U (1999)> Research on the relationships between higher education and the world of work: Past achievements, problems and new challenges. Higher education, 38(2): 169-190

Torimiro, D. O and Akinyemiju, A. A (2004). Capacity building for agricultural extension workers in Osun State, Nigeria. Merit Publishers, Ile Ife. Pp. 37.

World Bank. (2015). Fact sheet: The World Bank and Agriculture in Africa. Pp. 19.