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EFFECTS OF EXTENSION WORKERS VISIT ON THE FARMERS PRODUCING QUALITY PROTEIN MAIZE IN BILLIRI LOCAL GOVERNMENT AREA OF GOMBE STATE, NIGERIA

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ABSTRACT
This study analyzed the effects of extension workers visit on the farmers producing quality protein maize in Billiri Local Government Area of Gombe State, Nigeria. Among the farming households, 105 were selected randomly. Structured questionnaires were used to collect information from the respondents. Descriptive and inferential statistics were used to analyze the data. Findings from the study showed that majority (53.33%) of the respondents got QPM seeds through Sassakawa Global 2000. Most (39%) of the QPM farmers were visited on quarterly basis. The F-ratio of 2.996 was significant indicating that the model is suitable for the data. The co-efficient for contact with source (0.126) was shown to be positive but not significant which implied that though the respondents have been visited by extension agents but the frequency of visits was low and this affected farmers' awareness of QPM technology which could be the reason for low rate of adoption of quality protein maize (QPM) by other farmers that have refused to adopt the technology. It is therefore recommended that extension services/ sources should be strengthened by employing more extension workers by Government, Private organizations and Non-governmental agencies for efficient information dissemination to farmers especially at the rural level and also encourage farmers to form groups that will enable them narrow the gap of technology transfer.

Keywords: Effects, Extension visit, Quality, Quarterly, Sassakawa.

INTRODUCTION
Agriculture is the foundation upon which the economic stability of a nation can be built. Food can only be sufficient for the nation only if farmers are being informed and trained with adequate modern techniques for large scale production through efficient extension service (Daluba, 2013). Maize (*Zea mays* L.) is a staple food for large population groups around the world particularly in developing countries. Maize is major source of carbohydrate, protein, vitamins and minerals which provides major source of calories in Nigeria, thus offering to meet African's food needs (Ado, 2010). Maize has the highest yield per hectare compared to other cereal crops like wheat and rice. It ranks third to rice and wheat as the most important cereal crop used as staple food and animal feed and raw material for industries (Mboya, 2011). Its low nutritional value with respect to protein quality has prompted agriculturist, nutritionists and policy makers to develop ways of improving its protein quality to produce a good quality variety known as Quality Protein Maize (Abdullahi *et al*., 2012). Quality Protein Maize has a high content of lysine and tryptophan, which are the two amino acids found only in meat and

egg as special maize with better nutrition been accepted by farmers. Quality protein maize also called 'QPM' resulted from the breeding of high-lysine mutants of maize (*opaque-2*) and kernels with modifier genes that gave the endosperm an increased protein quality.

According to Ado *et al*. (2013), Quality protein maize also known as Sammaz14 is classified as a species of *Zea mays* L. QPM kernels are harder and dry more quickly (Pixley *et al.,* 2011). It is white in colour and morphologically characterized as a non-tillering, erect and medium maturing, grown across Nigerian ecological zones but specifically adaptable in Guinea savanna zones. Quality protein maize takes 106-110 days to mature having an estimated protein yield of 5-8t/ha. Its outstanding characteristics are seen as having good seed quality, high yield, more tasteful and tolerant to striga. In terms of pest and diseases, it is resistant to stem borers and maize streak virus (Ado *et al*., 2013).

Adoption of improved technology is important because it will generate key indicators for measuring farm level impact so as to improve farming practices. New agricultural technologies have the potential to reduce malnutrition and food shortage through the adoption of QPM. Technology must be appropriate to the potential adopter as this is a precondition for technology transfer. Dissemination should focus more on youth engaged in Agriculture, as they are the ones who usually embrace newly improved crop varieties than the old conservative farmers (Orient, 2014). Daluba (2005) revealed that demonstration farms are good communication grounds for the dissemination of useful and vital innovations to farmers by extension service workers. By this, farmers can be fully educated and acquainted with the newly introduced farming techniques. Agricultural extension on farm production has shown to have had impact on farmers' adoption rate of new technologies disseminated to them as reported by Dinar *et al*. (2007).

Extension has been defined as a system of education extending beyond the classroom to individuals on the farm (Asiabaka, 2002). For farmers to respond positively to new ideas, they must be properly educated on how best to apply the ideas on the farm. To serve farmers effectively an extension service must be in contact with them and this contact must be regular and on a schedule known to farmers. Messages and skills must be regular and timely so that farmers will make best use of their resources. The main purposes of extension visit to farmers is one, to advise and teach farmers and encourage them to adopt improved agricultural technology that is relevant to their resources and skills. Secondly, is to enable extension staff and through them, researchers to be closely and continuously acquainted with farm conditions and problems so that production recommendations and agricultural research are relevant to actual farmers' needs.

Therefore extension educational process if effectively handled reduces delays in translating research findings into action. Agricultural education particularly the non-formal and extension type will go a long to move millions of farmers from the traditional to modern farming.

Agricultural extension workers are personnel who are responsible for meeting the goals of extension system. Extension services can be effectively improved if the extension workers were provided with functional mobility, attractive incentive, regular supervision, in-service training and other motivational strategies. A prerequisite for the development and dissemination of a new technology (QPM as related to the study area) is to fully know the target farmers and their participation. Lack of improved technologies or non-adoption of technologies by farmers has been given as a major reason for low productivity of small-scale farmers. Communication is an important component that links researchers, extension workers and farmers in an agricultural system and this affects the rate of adoption (Van and Hawkins, 1996).

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MATERIALS AND METHODS

Billiri Local Government Area is located in the southern part of Gombe State situated in Guinea savanna ecological zone of Nigeria. The estimated area has about 737 km², 285 sq miles and a population of 202,144 inhabitants (National Population Commission [NPC], 2006). Its headquarters are in the town of Billiri in the northeast of the study area. A345 highway at 9°51′53″N 11°13′31″E (https://en.wikipedia.org/wiki/Billiri. retrieved 4/9/2015).

Sampling Procedure and Sample Size

A sample size of 105 QPM farmers were randomly selected and used for the study. Ten (10) farmers were selected from each of the nine (9) wards (Bare, Banganje North, Banganje South, Billiri North, Billiri South, Kalmai, Tanglang, Todi and Tudu Kwaya) and fifteen (15) farmers were selected from Tal ward making a total of 105 QPM farmers. Random sampling technique was used to give the respondents equal chance of being chosen.

Method of Data Collection

Primary and secondary data were used in this study. Primary data used were obtained using structured questionnaires that were administered to the farmers. The secondary data were gathered from publications of Sasakawa Global 2001, Agricultural development programme (ADP, Billiri LGA), National Agricultural Seed Council (NASC), Ministry of Lands and Survey, Association of Maize Farmers in Nigeria (MAAN, Billiri branch), journals, internets and agricultural related organizations.

Analytical Techniques

Descriptive statistics such as percentages, frequencies to access the seed distribution to Quality Protein Maize farming households by extension services and magnitude of extension visits. Data were analyzed using regression to determine the effects of the independent variables on the dependent variable (Y). A multiple regression model was used to obtain the equation relating y to x showing that it contains more than two variables. The implicit and the explicit forms of the linear function are given in eq. (1) and eq. (2) as:

$Y= f (X_1+X_2+\ldots+Xn) +e$ …(1)

$Y= a+b_1X_1+b_2X_2+b_3X_3+\ldots+ e)$ …(2)

where;

Y= Dependent variable

a = Constant,

b = slope of the line meaning the coefficient

X_1 = Age (years)

X_2 = Sex (gender)

X_3 = Marital Status (married, single or divorced)

X_4 = Educational level (formal and non-formal)

X_5 = Farming experience (years)

X_6 = Farm size (hectare)

X_7 = Household size (number of dependents)

X_8 = Land ownership (inheritance, hired or purchased)

X_9 = Level of awareness (knowledge)

X_{10} = Source of awareness (information agents like Sassakawa, NGOs, farmers, etc.)

X_{11} = Contact with extension agents (number of visits: weekly, fortnightly, monthly, and quarterly)

X_{12} = No. of bags harvested (quantity)

X_{13} = Type of labour used (family labour or hired)

$X_1 \ldots X_{13}$= are the independent variable and

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e = error term.

The study was, thus, concerned with the effect of extension visits determined by the respondents contact with source (extension services).

RESULTS AND DISCUSSION

The study showed that the village extension agents, Sasakawa Global and others constituting relatives, friends and neighbours were the different source through which information are disseminated to the rural farmers. Table 1 revealed that majority (53.3%) of the respondents in the study area get improved Seeds from sasakawa Global 2000 while 27.6% and 19.1% constituted village extension agents and others.

The results in Table 2 showed that majority (39%) of the respondents were visited quarterly, monthly (36.2%), fortnightly (8.6%) and no visit (16.2%). This means that respondents had an average level of awareness of improved agricultural technologies and they can do better if visited frequently. The result in Table 3 showed the F-ratio of the linear coefficient was 2.996 at 5% level of significance based on time. This indicated that the level of awareness achieved was as a result of the timely introduction of Quality Protein Maize to farmers in the study area by their respective sources.

Table 1: Sources of Awareness and QPM Seed Distribution through Extension Visit

Variables	**Frequency**	**Percentage**
Sources of awareness:		
Sasakawa global 2000	63	60
Others (relations/friends/neighbors)	42	40
Total	**105**	**100**
Seed distribution:		
Sasakawa global 2000	68	53.3
Village extension agents	23	27.6
Others (market/friends/relations)	14	19.1
Total	**105**	**100**

Source: Field survey, 2014

Table 2: Distribution of the Respondents according to Magnitude of Extension Visit

Variables	**Frequency**	**Percentage**
Extension visits:		
Fortnightly	9	8.6
Monthly	38	36.2
Quarterly	41	39
None	17	16.2
Total	**105**	**100**

Source: Field survey, 2014

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Table 3: Effect of Socio-economic Characteristics on Rate of Adoption of QPM

Variables	**Coefficient**	**%**
Constant	-7.865	3.129**
X_1 (Age)	-0.024	0.069
X_2 (Sex)	-0.121	-0.251
X_3 (Marital status)	0.536	1.063
X_4 (Education level)	0.478	3.371**
X_5 (Farming experience)	0.167	0.444
X_6 (Farm size)	-0.350	-1.262
X_7 (Household size)	0.197	0.671
X_8 (Land ownership)	-0.248	0.137
X_9 (Level of awareness of QPM)	0.114	0.137
X_{10} (Sources of awareness)	0.139	1.011
X_{11} (Contact with sources)	0.126	0.609
X_{12} (No. of QPM bags harvested)	0.961	2.910**
X_{13} (Labour types)	-0.324	-1.362
R^2	0.300	
R^2 adjusted	0.200	
F- ratio	2.996**	
Std. Error	1.62821	

**significant at 5%.
Source: Field Survey, 2014

The linear co-efficient of contact with extension agents ($X_{11} = 0.126$) was shown to be positive but not significant. This implied that though the respondents have been visited by extension agents but the frequency of visits was low and this hindered other farmers to become aware of QPM technology which could be the reason for the low rate of adoption by other farmers that have refused to adopt the technology (Anaeto, 2012).

CONCLUSION AND RECOMMENDATIONS

The study concluded that the visits by the extension agents was inadequate and contact between respondents and sources showed positive. This showed that extension workers played important roles as channels of information dissemination. The study recommended as follows:

1. The extension services/sources are needed to be strengthened by government, private and non-governmental agencies employing more extension workers most especially at the village levels.
2. Extension visits to farmers should be done more frequently, timely and be supported with field demonstrations, testing of improved food crop and giving feedback on the problems faced by the farmers to the various institutions as concerned.
3. The farmers should be encouraged to form groups (cooperative societies) so as to pool their resources together for easy access to a lot of benefits especially in terms of transferring information to one another thereby narrowing the gap of technology transfer.

REFERENCES

Abdullahi, A., Sulaiman, M. S., Miko, A. J. and Ismail, I. S. (2012). *Assessment of the factors responsible for facilitating Extension services in Ungogo L.G.A of Kano State Nigeria.* Proceedings of Agricultural Society of Nigeria. Pp. 217-222.

Ado, S. G., Showemimo, F. A., Falaki, A. M., Abdullahi, S. O. and Abdullahi, U. S. (2013). *Catalogue of registered Crop Varieties,* **5:** 12-19.

Ado, S. G., Usman, I. S. and Abdullahi, U. S. (2010). Recent Development in maize Research at institute for Agricultural Research Samaru, Nigeria. *Journal of Life Sciences,* **4**(32): 1934-7391.

Anaeto, F. C., Asiabaka, C. C., Nnadi, F. N., Ajaero, J. O., Ugwoke, F. O., Ukpongson, M. U. and Onweagba, A. E (2012). The role of Extension Officers and extension services in the development of agriculture in Nigeria. Federal University of Technology Owerri, Imo State, Nigeria. *Journal of Agricultural Research,* **1**(6): 180-185.

Daluba, N. E. (2013). Evaluation of Role Performance of Extension Service Workers on Farmers' farming practices in Kogi East Agricultural Zones of Kogi State, Nigeria. *Comprehensive Research Journal of Agricultural Science*, **1**(2): 014-019.

Dinar, A., Karagianis, G. and Tzouvelekas, V. (2007). Evaluating the impact of agricultural extension on farmers' performance in Crete: a non-neutral stochastic frontier approach. *Agricultural Economics,* **36**(2): 135-146.

Asiabaka, C. C. (2002). *Agricultural Extension. A handbook for Development Practitioners.* Molsyfem United Services, Omoku, Rivers State. **1**(2): 148-152.

https://en.wikipedia.org/wiki/Billiri; retrieved on 4/9/2015. Coordinates of Gombe State and Billiri Local Government Area.

Mboya, R., Tongoona, P.; Derene J., Mudhara, M. and Longyinfua, A. (2011). The dietary importance of maize in Katumba ward, Rungwe district, Tanzania and its contribution to household food security. *African Journal. Agricultural Research,* **6**(11): 2617-2626.

National Population Commission [NPC] (2006). *Nigeria population statistical bulletin.*

Orient Newspaper (2014). *Cultivating Bio-fortified Crops for Improved Health.*

Pixley, K. V., Nuss, E. T. and Tanumihadjo, S. A. (2011). *Quality Protein Maize in Africa. American Society for Nutrition.*

Van, D. B. and Hawkins, H. S. (1996). *Agricultural Extension,* 2nd edn. Blackwell Science Ltd. London. Pp. 96-119.