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Assessment of Level of Information Transfer by Farmer Field School Graduate Cocoa Farmers in Ondo State, Nigeria

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Abstract
The study assessed level of information transfer from cocoa FFS farmers to other cocoa farmers in Ondo State, Nigeria. The specific objectives were to: describe the socio-economic characteristics of the FFS graduate farmers in Ondo State; examine the percentage of FFS who were involved in transfer of information to other farmers, and determine the nature of information shared with other farmers. A multistage sampling procedure was used in selecting 77 FFS graduate farmers for the study. Descriptive statistics used included frequency counts and percentages while the logit regression was used to test for the relationship between socio-economic characteristics of respondents and their level of knowledge transfer. The results of the study indicated that 75 FFS farmers (97.4%) were able to transfer information received on several aspects of cocoa cultivation with other cocoa farmers. From the logit regression result, educational level, farming experience and gender were positively and significantly related to information transfer abilities of the FFS farmers. It was concluded among others that FFS facilitators should continue to strengthen their ties with the FFS graduate farmers and to encourage them the more in sharing information with other farmers.
Keywords: Information Transfer, Farmer Field School, Logit Regression, Ondo State.

1.Introduction

There is a popular saying that knowledge is power. However knowledge can only be acquired only when a famer receives information. New agricultural technologies (Innovations) even when considered as technically sound are of limited value if they are not adopted by farming communities. Therefore, there is need for the diffusion of innovations among farming communities. The few famers that are usually trained in a famer field school need to share the knowledge and skill gained (that is, information received in a field school) with other famers if the full benefit of FFS is to be realized in farming communities. To this end, an important assumption of FFS is that participants after graduation, will informally share the knowledge gained in a field school with other farmers (non-participants). (David, 2005). The knowledge acquired by FFS graduates in a field school need to be shared with other farmers. In spite of this, there has been a great concern on the diffusion (or sharing) of knowledge gained by farmer Field School graduates to other farmers. This study intends to answer the following research questions:

(i) What are the socio-economic characteristics of the FFS farmers in Ondo State?
(ii) Have these FFS Farmers been able to share their knowledge with other farmers?
(iii) What is the nature of knowledge shared with other farmers? The specific objectives of the study were to:

(i) describe the socio-economic characteristics of the FFS graduate farmers in Ondo State
(ii) examine the percentage of FFS who were involved in transfer of information to other farmers, and
(iii) determine the nature of information shared with other farmers.

The Study Hypothesis

$\mathbf{H_{O1}}$: There is no relationship between information transfer abilities of respondents and their socio economic characteristics.

Ha: Significant relationship exists between information transfer abilities of respondents and their socio economic characteristics.

2. Literature review

Farmer field schools were first developed in South East Asia for farming rice farmers in Integrated Pest Management (IPM) (NAERLS/ABU, 2008)The first field schools were established in 1989 in Central Java, Indonesia during the pilot phase of the IPM programme in response to a devastating insecticide-induced outbreak of brown plant hoppers (Nilaparvata Lugens) on rice (NAERLS/ABU, 2008; David et al, 2006).The objectives of the FFS according to David et al (2006) and van de Fliert and Braun (2005) are to: (1) provide an environment in which farmers acquire the knowledge and skills to be able to make sound management decisions (2) sharpen farmers' ability to make critical and informed decisions that make their farming activities more profitable and sustainable (3) improved farmers' problem solving abilities (4) show farmers the benefits of working in groups and encourage group activities and (5) empower farmers to become experts on their own farms and to be more confident in solving their own problems.

The achievement of the afore-mentioned objectives centered on the farmers acquiring knowledge and disseminating it to other farmers who had not participated in a field school. In fact, according to Gallagher (2005) the broad problem which FFS was designed to address was lack of knowledge among farmers relating to agro-ecology.

The implementation of agricultural projects using the FFS approach had led to a deeper understanding of agricultural problems and causes. It is also recognized that sustainable agricultural development required more than just the acquisition of ecological knowledge by individual farmer. It also required the development of a capability for generating, adapting and extending this knowledge within farming communities. The weakness of this capability in most farming communities is itself an important problem, one which has often been exacerbated by earlier agricultural development approaches/programmes that fostered a dependency on external sources of expertise. The FFS extension approach, which is a group-based learning process (Dilts, 2001) is poised to correct this weakness of earlier approaches. Thus, the FFS approach is a direct response to the needs of farming communities because it brings together concepts and methods from agro-ecology, experimental education and community development (van de Fliert and Braun, 2005 and David et al, 2006).As mentioned earlier, FFS participants are expected to share the knowledge acquired with other farmer. According to Rola, et al (2000), there was no significant transfer of knowledge by Farmer Field School graduates to other farmers in a study carried out in Philippiness. Similar result was reported by Quizon,et al(2001). In contrast to these however, a study conducted on Kenya Farmer Field School by IFAD (1998) reported that there were some sharing of information by Farmer Field School graduates with other farmers.

2.1 Conceptual framework

In the 1990s, participatory research and extension approaches emerged (Agbamu, 2006). These approaches ensured the development of technologies together with farmers, farmers' experimentation and evaluation, sharing of experiences and farmer-to-farmer innovation dissemination with extension workers as facilitators. Prior to the era of participatory approaches, for many what rural people know is assumed to be primitive, unscientific and over taken by development, and so formal research and extension must transform what they know so as to improve their livelihoods. An alternative view is that local knowledge is a valuable and underused resource which can be studied collectively and incorporated into development activities. Neither of these views though is entirely satisfactory because of static view of knowledge implied (Long and Long, 1992; Scoones and Thompson, 1994). It is more important to recognize that local people or farmers are always involved in active learning, reinventing technologies, in adapting their farming systems and livelihood strategies. Farmers are major stake holders in the extension system and ought to be involved in the system and not neglected. According to Ashford and Rest (1999) stake holders involvement processes are argued to be more inclusive and targeted. Thus, the involvement of appropriate representation of stake holders in decision-making during extension delivery is important. Agbamu (2006) asserted that main shift in orientation occurred when the enhancement of farmers capacity to develop and diffuse technologies among themselves became accepted as a foundation of agricultural development. These greatly changed the roles of farmers and extension agents (or rural development workers) in the diffusion of innovations. For farmers to get awareness about improved farming practices and accept these farming practices, agricultural

development organizations usually rely on diffusion/sharing of information or knowledge within farming communities (Agbamu, 2006; David et al., 2006). Of all the participatory extension approaches, farmer field school has proven to be more effective in involving the farmers (Ajayi and Okafor, 2006; Ebewore, 2012). Farmers trained in FFS are involved in discovery learning (that is, learning by doing) which enabled them to come to their own conclusions about an innovation. It is expected that graduate of FSS will informally share the knowledge acquired with other farmers. David (2005) opined that sharing of innovation/knowledge with other farmers ensure that FSS becomes more effective. This study is therefore predicated on this concept.

3. Methodology

3.1 The Study Area

The study was carried out in Ondo State, Ondo State was created on 3rd February, 1976 from the former Western region of Nigeria. It included the present Ekiti State until 1996 when Ekiti State was split off. The state consists of eighteen Local Government Areas. Ondo State covers a land area of 14,606 square Kilometers and lies between Latitudes 5^0 45' and 7^0 52' N and longitudes 4^0 20' and 6^0 05 East with a population of 4,011, 407 (NPC, 2006). Ondo State is bounded on the East by Edo and Delta States, on the West by Ogun and Osun States and to the South by Bright of Benin and Atlantic Ocean. The majority of the state's citizens lives in urban centres, the ethnic composition of Ondo State is largely from the Yoruba sub groups of Akoko, Akure, Ikare, Ilaje, Ondo and Owo. The Ijaws minority populations inhabit the coastal areas. Agriculture (including Fishing) constitutes the major occupation of the people of the state. Ondo State is the leading cocoa producing state in Nigeria. Other agricultural Crops grown in the state include yam, cassava, kolanuts, palms and cocoyam.

3.2 Sampling procedure and Sample Size

The population of the study comprises of all cocoa farmers that have been involved in Farmer Field School (FFS graduates) training, Ondo State was purposively selected because it has long been involved in FFS extension approach. The researchers also have good knowledge of the state. The lists of the FFS graduate farmers were obtained from the sustainable Tree Crops Programme (STCP) and ADP offices in the state. A multistage sampling procedure was used in selecting respondents for the study as follows:

Stage I: Out of the three agro-ecological zones in Ondo State, one was purposively selected based on where cocoa farmers are intensively involved in FFS. The agro-ecological zones are One North, Ondo Central and Ondo South, Ondo Central with 105 registered FFS graduate farmers was selected.

Stage II: Three Local Government Areas from this Zone were purposively selected based on the concentration of cocoa FFS in these areas. The Local Government Areas selected were Idanre, Ondo East and Ondo West with registered FFS graduate farmers of 383, 221 and 222 respectively.

Stage III: Farmer field school graduate farmers were randomly selected from the selected local government areas. Ten percent of the farmers were selected. Thus a total of 82 farmers were expected. However, only 77 questionnaire were used for the study, since some questionnaires were not returned

3.3 Method of Data Collection

A structured questionnaire was used for data collection. The questionnaire comprised both open and closed ended questions which measured the key variables of the study.

3.4 Method of Data Analysis

The level of knowledge transfer was determined by asking respondents to indicate whether they have trained others or not. Respondents indicated yes or no depending on whether they shared their knowledge with other farmers or not. Simple frequency counts and percentages were then used to determine the level of transfer of knowledge. Furthermore, the respondents were asked to indicate the numbers of other farmers they shared knowledge with and the nature of knowledge shared. The logit regression was used to test for the stated hypothesis.

The binary logit model assumes that the dependent variable follows a logistic distribution of the form:

$$P_i = E(y = 1/x_i) = \frac{1}{1 + e^{-(b_0 + b_i x_i)}}$$

Or for ease of exposition

$$P_i = \frac{1}{1 + e^{-b'_1 x_i}} = \frac{e^{b'_1 x_i}}{1 + e^{b'_1 x_i}}$$

Where

$b'_i x_i = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6$

Where,

Y = (Information Transfer = 1, Otherwise = 0);

b_0 = constant

$b_1, b_2, b_3 \ldots b_6$ = respective coefficients

X_1 = Age (Years)

X_2 = Gender (1, male: 0, otherwise)

X_3 = Marital status (1, married: 0 otherwise)

X_4 = Educational level (number of years spent in schooling)

X_5 = Farming experience(number of years spent in farming)

X_6 = Farm size (Hectares)

X_7= Household size (Numbers)

is known as the logistic (cumulative) distribution function.

The equation

$$P_i = \frac{1}{1 + e^{b'_1 x_i}} = \frac{e^{b'_1 x_i}}{1 + e^{b'_1 x_i}}$$

is known as the logistic (cumulative) distribution function

4. Results and discussion

Table 1 shows the socio-economic characteristics of the respondents. Age of farmers ranges from 31 – 70 years. No FFS farmers were below 31 years. This indicates that youth in the study area were not actively involved in cocoa FFS training. Therefore FFS graduates are mostly adults (van de Fliert and Braun, 2005). Most of the respondents are within the economically active age group. Ogungbile et al (2002) asserted that farmers in this range of age are always active, and this can lead to positive effect on cocoa production. Since all the respondents are adults, it means that they will be able to imbibe the adult learning principles which are the thrust of FFS. About 92.2% of the respondents were males. The result showed that more males than females were involved in FFS training programme and by implication cocoa farming. This may not be unconnected with the perennial nature of cocoa which often leads of permanent holding on land which traditionally is owned by men. Solomon (2008) also reported a similar result for oil palm. The result of marital status of FFS graduates farmers showed that majority (over 80%) were married. According to Dikito-Watchmeister (2001), Marital status is a crucial factor in shaping social rural participation and acceptance of innovation. About 87% of the respondents had one form of formal education or the other. Only 12.99% of the respondents did not receive any formal education. Njoku (1991) asserted that formal education has a positive influence on adoption of innovation. Majority of the respondents had good farming experience. More than 93% of them had more than 11 years farming experience. This is a common feature of tree crop farming in Southern Nigeria as Solomon (2008) had a similar result of oil palm. Furthermore, Ogungbile et al (2002) indicated that the length of time of farming business can be linked to the age of farmers, access to capital, and this experience may explain the tendency to adopt innovations and new technology. Farm sizes in the study Area were rather small with 62 farmers (80.52%) possessing less than 6 hectares of land. The land tenure system which invariably leads to fragmentation may be partly responsible for this. Koyenikan (2002) observed that the mean farm size for arable and tree crops such as cocoa, Kolanuts and oil palm was 1.45 hectares in Ondo State. The implication is that majority of the cocoa farmers operate small holdings. According to Alamu et al (2002), farmers with more resources including land are more likely to take advantage of new technology. The household size were large. Over 67% of the respondents had more between 6 and over 10 members in their households. The large household sizes may probably be indications that many of the children assist in cocoa farming. According to Solomon (2008), Banmeke (2003), Olaniyan and Jibowo (1997) farmers have between 4 -6 children who assist in farming and other household activities.

Table 2 shows the number of FFS farmers who shared their knowledge with others farmers and the number of people the knowledge was shared with . From the result presented in Table 2, about 75 FFS graduate farmers representing 97.4% were able to share their knowledge with other farmers. All those who were involved in knowledge sharing established only one informal school. Out of those 75 farmers, 30 were able to share knowledge to between 1 to 10 other farmers, 39 shared with between 11 to 20 other farmers and only 6 shared knowledge with between 21 to 31 other farmers.

The result shows that a high proportion of the FFS graduate farmers transferred knowledge gained to other farmers. This result agrees with the finding of IFAD (1998) in Kenya which reported that there was some sharing of information by Farmer Field School graduates with other farmers STCP (2005) also reported some knowledge sharing between cocoa FFS farmers in Cross River State, Nigeria with other farmers in their areas.

Table 3 further revealed that FFS graduate farmers shared information on several areas of cocoa cultivation which included pruning of chupons, shade management, proper use of agro-chemicals, pest identification and control,

HIV/AIDS sensitization, avoidance of misconceptions and avoidance of child labour . The implication of the finding on transfer of knowledge is that majority of the FFS farmers sustained one of the principles of FFS on transferring of knowledge by establishing their own informal schools to train others on various aspect of cocoa farming (Ajayi and Okafor 2006, David et al, 2006).

For instance the FFS graduate farmers were able to share information on pruning of chupons with 160 others farmers , shade management with 145 others farmers and HIV/AIDS sensitization with 102 farmers.

4.1 Test of hypothesis

Assumption knowledge transfer was dichotomized (transfer of knowledge = 1 other wise zero). From the logistic regression result presented in Table 4, it was obvious that educational level, farming experience and gender were positively and significantly related to information transfer. That is to say the more educated the farmer is the more likely he shared information with other farmers; by the same reasoning, male farmers are likely to transfer information to others compared with female farmers. On the other hand, household size and farm size were negatively and significantly related to information transfer. A plausible explanation is that large household size and large farm size would distract the farmers from sharing information with other farmers as he will focus on his family and farm activities.

5. **Conclusion and recommendation(s)**

The fact that 75 FFS graduate farmers (99.4%) were able to share knowledge gained from FFS training with other farmers is a clear indication that majority of the FFS farmers sustained one of the principles of FFS on transferring of knowledge by establishing their own informal schools. FFS training thus is one of the ways of promoting private participation in extension delivery. This becomes crucial in the light of the limited success experienced in public extension delivery.

Based on the findings, the following recommendations are suggested.

- FFS facilitations need to continue to collaborate with graduate farmers and continually encourage them never to relent in their effort to transfer information to other farmers
- There should be strong social ties between FFS trainees and those they transfer information to. A verbal contract arrangement could be established between FFS facilitators and FFS graduates on one hand and between FFS farmers and those they transfer information to.

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Table 1 Socio-Economic Characteristics of respondents

Variables	Frequency	Percentage (%)
Age (Years)		
31 – 40	**22**	**28.57**
41 – 50	**15**	**19.48**
51 – 60	**38**	**49.35**
Above 60	**2**	**2.60**
Gender		
Male	**71**	**92.20**
Female	**6**	**7.80**
Marital Status		
Never Married	**6**	**7.80**
Married	**62**	**80.52**
Divorce	**1**	**1.30**
Separated	**3**	**3.90**
Widow/Widower	**5**	**6.49**
Educational Level		
No Formal Education	**10**	**12.99**
Primary Education	**40**	**51.95**
Secondary Education	**14**	**18.18**
OND/NCE	**5**	**6.49**
HND/First Degree	**7**	**09.09**
Post Graduate	**1**	**1.30**
Farming Experience (Yrs)		
Less than 11	**5**	**6.49**
11 -20	**19**	**24.68**
21 – 30	**22**	**28.57**
31 – 40	**17**	**22.08**
More than 40	**14**	**18.18**
Farm Size (Hectares)		
5 and below	**62**	**80.52**
5.1 – 10	**14**	**18.18**
More than 10	**1**	**1.30**

Source: Survey Data, 2010

Table 2: Distribution of FFS Farmers According to their Knowledge Transfer to other Farmers.

Particular	Frequency	Percentage
Involvement in knowledge		
Sharing		
Yes	**75**	**97.40**
No	**3**	**2.60**
Schools Established		
One	**75**	**100%**

Source: Survey Data, 2010

Table 3: Nature of Information Transferred by FFS Farmers and Beneficiaries

S/N	Nature of Information	Number of beneficiaries
1.	**Pruning of Chupons**	**160**
2.	**Shade Management**	**145**
3.	**Sanitary Harvest**	**139**
4.	**Soil Fertility Management**	**125**
5.	**Proper use of Agro-chemicals**	**123**
6.	**Pest identification and control**	**114**
7.	**HIV/AIDS sensitization**	**102**
8.	**Avoidance of Misconceptions**	**96**
9.	**Child Labour**	**31**
10.	**Others**	**152**
	Total	**1,187**

Source: Survey Data, 2010

Table 4 Relationship Between Respondents' Socio-economic Characteristics and their Transfer of Knowledge (Logit Regression Results)

Explanatory Variables	Co-efficient	t-value	Sig	Odd Ratio
Constant	-0.748	-0.372	0.766	0.620
Age(X_1)	-0.042	-0.943	0.576	0.651
Gender(X_2)	0.051	-3.272	0.028*	12.741
Marital Status(X_3)	-0.281	-0.446	0.740	0.848
Educational Level(X_4)	-0.762	2.427	0.044*	1.678
Farming Experience(X_5)	0.668	3.338	0.022*	53.741
Farm size(X_6)	-0.036	-2.872	0.031*	0.972
Household Size(X_7)	-0.239	-6.218	0.000*	150.349
Model Chi-Square (X^2)	245.876			
Nagel Kerke R^2	82%			
Overall F% correct classification	93.4			
C^0 Degree of freedom	7			
Significant Level (5%)	0.00			

Source: Survey Data, 2010

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