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Knowledge Sharing Between Farmer Field School Graduate Farmers and Other Farmers on Improved Cocoa Cultivation Practices in Edo State, Nigeria

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Abstract

This paper investigated the extent of knowledge sharing by cocoa FFS graduates farmers in Edo State with other cocoa farmers. The objectives of the study included to: ascertain the extent of knowledge sharing by FFS farmers, the nature of knowledge shared and the number of beneficiaries from the shared knowledge. A multistage sampling procedure was used to collect data from 68 respondents. A well structured questionnaire was used for data collection. Simple descriptive statistics (frequency counts and percentages) and logit regression were used to analyze the data. The results of the study showed that there was no significant sharing of knowledge by the FFS farmers with other farmers as only 13 (19.1%) FFS farmers were involved in knowledge sharing. The logit regression result showed that all the socio-economic variables except household size and farm size were insignificant in influencing the FFS farmers' knowledge sharing abilities. From the findings of the study, it was therefore recommended that FFS graduate farmers should be encouraged to sign knowledge sharing contract, to organize field day and the need for FFS facilitators to monitor the graduates to ensure that the contractual agreement is adhered to should be stressed.

Keywords: knowledge sharing, farmer field school, cocoa cultivation practices, sharing contracts, Edo State

1. Introduction

The farmer field school (FFS) is a form of adult education which uses experiential learning to build farmer's capacity to manage his agricultural activity (Ajayi & Okafor, 2006; Van de Fliert & Braun, 2005; Pontius, Dilts, & Bartlet, 2002). As an extension approach, FFS is quite novel to West Africa and worldwide, there are few examples of its application to tree crops and perennial crop (e.g. cocoa) in general (David et al., 2006). Since 2003, The sustainable Tree Crops Programme, hosted by the International Institute of Tropical Agricultural (IITA), has pioneered FFS on Cocoa Integrated Crop and Pest Management (ICPM) in Cote d' Ivoire, Ghana, Nigeria and Cameroon. FFS focuses on building farmers capacity to make well informed crop management decisions through increased knowledge and understanding of the agro-ecosystem (David et al., 2006). However, an important assumption of FFS is that participants will informally share the knowledge acquired in FFS with other farmers (David et al., 2006).

Edo State currently hosts 22 cocoa farmer field schools. Yet no study has been carried out to assess the level of knowledge sharing between cocoa FFS farmers and other cocoa farmers. The following research questions thus arise:

What are the socio-economic characteristics of the FFS farmers in Edo State, Nigeria?

Have these farmers been able to share the knowledge acquired from FFS informally with other farmers? What is the nature of knowledge shared, if any? What is the number of beneficiaries of such knowledge sharing?

The specific objectives of this study are therefore to:

- i. describe the socio-economic characteristics of the FFS farmers

- ii. ascertain whether cocoa FFS farmers have shared knowledge acquired from FFS training with other cocoa farmers
- iii. determine the nature of knowledge shared with other farmers
- iv. determine the number of non FFS farmers who benefitted from knowledge sharing, if any.

The study tested the following hypothesis, stated in the null form:

Ho: There is no significant relationship between knowledge transfer of respondents and their socio-economic characteristics.

2. Literature Review and Theoretical Framework

The farmer field school literature devotes much attention to the challenges of scaling up. The FAO team that developed the FFS approach recognized farmer led expansion and farmer-to-farmer diffusion as instrumental to the scaling up process and critical for making the approach most cost effective and sustainable (Diemijeny, 2011). Therefore an important assumption of FFS is that participants will informally share the knowledge acquired in FFS with non-participants (David et al., 2006).

In spite of this, there has been more concern on the sharing of knowledge between FFS farmers and other farmers. According to Rola, Quizon, Jamais, Paunlagai and Provido (2005), there was no significant transfer of knowledge by farmer field school graduates to other farmers in a study carried out in Phillipines. Similar result was reported in Indonesia by Quizon, Gershon and Rinku (2001). Furthermore, research conducted in West Africa (Simpson & Owen, 2002), the Philippines (Rola et al., 2002) and Sri Lanka (van De Fliert & Braun, 2005) suggested that FFS participants are more likely to share practices and skills and less likely to discuss abstract concepts and principles with other farmers. The effectiveness of farmers-to-farmer diffusion was called into question by a study which showed that the knowledge of secondary recipient on key technical topics was not significantly better than the control group of farmers (Rola et al., 2002). However, besides observation made in Ghana and Mali that some FFS farmers established close, almost apprenticeship type, relations with one or two other farmers (Simpson & Owen, 2002), the literature provides little discussion on whether the way in which farmers share knowledge affect knowledge retention and learning. In contrast to these, however, studies conducted on Kenya farmer field school by IFAD (1998) and by sustainable Tree Crops Programme (STCP); Nigeria (2006), in Cross River State, Nigeria, reported that there were some knowledge sharing of information by farmer field school graduates to other farmers. The issue of knowledge sharing is very crucial as it is one of the yardsticks of assessing the effectiveness of FFS as an agricultural extension approach (Mutandwa & Mpangwa, 2004).

3. Research Methodology

The study was conducted in Edo State of Nigeria. Edo State was created on August 27th, 1991. The population of the entire state is approximately four million (National Population Commission, NPC, 2006).

Edo State has a land mass of 19,749 square kilometers, and lies on latitudes 05°44'N and 07°34'N and longitudes 05°4'E and 06°E. Edo State is low lying except towards the Northern axis where the Northern and Esan plateaus range from 183 metres of the Kukuruku hills to 672 metres of the Somorika hills. Edo State is so located that it forms the nucleus of the Niger Delta region. It is bordered by Kogi State to the North and Delta State to the East and South, Ekiti and Ondo States to the West. The climate is typically with two distinct seasons - the wet (rainy) and the dry seasons. The wet season lasts from April to November and the dry season from December to March. The rainfall is high; the mean annual rainfall varies from 2600mm in the Southern part to nearly 1200mm in the Northern extreme. During the rainy season, the mean monthly temperature range is 18°C to 35°C and 30°C to 35°C during the dry season.

The climate of Edo State is favourable to agriculture which is the dominant occupation of the people of Edo State. The high rainfall is favourable for the cultivation of tree crops like cocoa, oil palm, kola nut and rubber. Other crops grown include yam, cassava, cocoyam, plantain/banana and pineapple. Fishing activities are also prevalent in the coastal area of the state. Edo state is divided into three agricultural zones.

The sampling frame (i.e. population of interest for the study) comprised of all cocoa farmers that have been involved in farmer field school (FFS graduates). The lists of these farmers were obtained from the STCP office and ADP office in Benin City, the state capital. A multi-stage sampling procedure was used in selecting the respondents for the study. In stage 1, one of three agricultural zones in Edo State was purposively selected based on where cocoa farmers are intensively involves in FFS training. The agricultural zones in Edo State are Edo North, Edo Central and Edo South; Edo North was selected. In stage 2, three local government areas were

randomly selected from Edo North agricultural zone. The local government areas selected were Owan East, Owan West and Akoko Edo. In stage three farmers were randomly selected from the list of registered farmers provided by STCP. Ten percent of the farmers were actually selected randomly. The total number of FFS farmers in these local government areas was 718 and 72 are expected to be selected. However, only 68 FFS farmers were used for the study since 4 farmers did not return their questionnaire.

A structured questionnaire was developed and used for data collection. The questionnaire comprised of both open and close ended questions which measured key variables of the study. The instrument for data collection was subjected to both face and content validity. Face validity was carried out by experts in the field of Agricultural Extension, Agronomy and Rural Sociology. This was achieved by seeking the opinions of these experts on the representativeness and adequateness of items designed to measure the various variables of the study. This procedure assisted in developing items that covered all the objectives and captured the content that was assessed in the study.

3.1 Method of Data Analysis

The level of knowledge sharing was determined by asking respondents to indicate whether they have shared knowledge with others or not. Respondents indicated yes or no depending on whether they shared knowledge acquired from FFS with other cocoa farmer or not. Simple frequency counts and percentages were then used to determine the number and percentage of those FFS farmers who shared knowledge with other farmers. Furthermore, respondents were asked to indicate the nature of knowledge shared with others and the number of beneficiaries.

The logit regression model was used to test the stated hypothesis. The binary logit model assumes that the dependent variable follows a logistic distribution of the form:

$$P_i = E(y = 1 / X_i) = \frac{1}{1 + e^{-(b_0 + b_1 X_i)}} \quad (1)$$

where

$$Y = b_0 + b_1 X_1 + B_2 X_2 + B_3 X_3 + B_4 X_4 + B_5 X_5 + B_6 X_6 + B_7 X_7 + e$$

Y = (1, knowledge sharing = 1; 0, otherwise)

b_0 = Constant

$b_1, b_2 \dots b_7$ = respective coefficients

X_1 = Age (chronological 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 as a cocoa farmer)

X_6 = Farm size (hectares)

X_7 = Household size (number)

e = error term

4. Results and Discussion

The socioeconomic characteristics of the cocoa FFS graduates farmers are as presented in Table 1. The result indicated that no FFS graduates farmer was below 31 years of age. This was an indication that youth in the study area were not actively involved in cocoa FFS training. The FFS graduate farmers were mostly adults (Van de Fliert & Braun, 2005; NAERLS/ABU, 2008).

Table 1. Distribution of respondents according to their socio-economic characteristics

Variable	Frequency (N= 68)	Percentage (100)
Age (years)		
31-40	16	23.54
41-50	21	30.88
51-60	24	35.29
Above 60	7	10.29
Gender		
Male	61	89.71
Female	7	10.29
Marital status		
Never married	11	16.18
Married	45	66.18
Divorced	4	5.88
Separated	3	4.41
Widow & widower	5	7.35
Educational level		
No formal education	8	11.76
Primary school	38	55.88
Secondary school	11	16.18
OND/NCE	6	8.82
HND/First Degree	5	7.35
Farming Experience (years)		
Less than 11 year	4	5.88
11-20	18	26.47
21-30	19	27.94
31-40	14	20.59
More than 40	13	19.12
Farm size (Hectare)		
5 and below	54	79.42
>5-10	12	17.64
More than 10	2	2.94
Household size		
1-5	18	26.47
>5-10	42	61.76
More than 10	8	11.77

Source: Author's computation.

Moreover, most of the respondents were within the ages of 31-60 years, which is 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 they will be able to imbibe the adult learning principles which are the thrust of FFS. About 89.71% of the respondents were males. The result showed that more males than females were involved in FFS training and by implication cocoa production. This

may not be unconnected with the perennial nature of cocoa which often lead to 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 the FFS graduate farmers indicated that over 65% were married. According to Dikito – Watchmeister (2001), marital status is a crucial factor on shaping social rural participation and acceptance of innovation. About 88.24% of the respondents had one form of formal education or the other. Njoku (1991) asserted that formal education has a positive influence on adoption of innovations. Majority of the respondents are quite experienced in cocoa farming. More than 94% of the respondents 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 for oil palm. Furthermore, Ogungbile et al. (2002) opined that the length of time of farming business can be linked to the age of farmers and 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 about 79.42% of the respondents possessing farm sizes of 5 hectares and below: The land tenure system which invariably leads to fragmentation may be partly responsible for this. The implication of this finding is that majority of the FFS 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 house hold sizes were large with over 61% of the respondents having between 6 and 10 members in their homes.

Table 2 shows the number of FFS graduate farmers who shared the knowledge they gained from FFS training with other cocoa farmers (non-participants of FFS). From the result presented in Table 2, only 13 FFS graduate farmers representing 19.10%, were able to establish their own schools and share knowledge with other cocoa farmers. Thus there was no significant transfer of knowledge from FFS farmers to other farmers. This result agrees with the finding of Rola et al. (2005) in Philippines and that there was no significant transfer of knowledge from farmer field school graduates to other farmers.

Table 2. Distribution of respondents according to sharing of knowledge with other farmers

Particular	Frequency	Percentage
Involved in knowledge sharing	13	19.10
Not involved in knowledge sharing	55	80.90
School established	13	19.10
Not established school	55	80.90

Source: Author's computation.

Table 3. Nature of knowledge shared by FFS graduates with other farmers

S/N	Nature of knowledge shared	Number of Beneficiaries
1.	Pruning of chupons	80
2.	Sanitary harvesting	48
3.	Shade management	50
4.	Soil fertility management	42
5.	Correct application of agro-chemical	45
6.	Pest identification of control	54
7.	Avoidance of misconception	28
8.	HIV/AIDS sensitization	65
9.	Child labour	56
10.	Control disease	72
11.	Identification of beneficial	40
12.	Others	41

Source: Author's computation.

Table 3 further showed the nature of knowledge shared by the FFS graduate farmers with other farmers. The results indicated that the FFS graduates shared knowledge in the following areas: pruning of chupons, shade management, correct application of agro-chemicals, pest identification and control, HIV/AIDS sensitization, avoidance of misconceptions and awareness of child labour. For example the 13 FFS graduate farmers were able to share knowledge on pruning chupons with 80 other farmers, on correct use of chemical with 45 other farmers and on child labour with 56 other farmers.

4.1 Testing of Hypothesis

Assumption: knowledge sharing was dichotomized (probability of respondents sharing knowledge = 1; otherwise 0) from the logit regression presented in Table 4 it was obvious that educational level, farming experience and gender were positively and insignificantly related to knowledge sharing. Thus it is expected that the more educated a farmer is the more likely he will share knowledge. The same reasoning applied to farming experience and gender. However, since these variables were insignificant in their relationship with knowledge sharing, it means that most of the respondents were unable to share their knowledge with other cocoa farmers. On the other hand, household size and farm size were negatively and significantly related to knowledge sharing. The probable explanation is that large household size and big farm size would distract the farmer from sharing his knowledge with others as he is more likely to focus his attention on his family and farm activities.

Table 4. Relationship between respondents' socio-economic characteristics and knowledge sharing (Logit Regression Results)

Explanatory variable	Coefficient	t-value	Significant	odd ratio
Constant	-0.564	-0.286	0.536	0.521
Age (X ₁)	-0.038	-0.781	0.428	0.433
Gender (X ₂)	0.044	1.211	0.120	10.514
Marital Status (X ₃)	0.212	-0.342	0.644	0.774
Educational Level (X ₄)	0.741	1.422	0.318	1.314
Farming Experience (X ₅)	0.528	0.948	0.621	44.122
Farm Size (X ₆)	-0.041	-2.913*	0.041	0.728
Household Size (X ₇)	-0.314	-5.998*	0.00	100.229
Model chi-square (X ²)	231.421			
Nagelkerke R ²	83%			
Overall f% correct				
Classification	94.1			
Degree of freedom	7			
Significant Level (5%)	0.00			

Source: Author's computation.

*significant at p < 0.05.

5. Conclusion and Recommendations

From the study it was observed that only 13 FFS farmers, representing about 19% were able to share knowledge gained from FFS training with other cocoa farmers. This showed that FFS farmers in the study area were unable to sustain one major assumption of FFS training. This shows that there was no significant sharing of knowledge between cocoa FFS graduate farmers and other cocoa farmers in the study area. Based on this finding, the following recommendations are therefore suggested to promote the sharing of knowledge by FFS farmers with other farmers:

- (i) Specific activities such as sharing contracts and field days should be promoted to encourage knowledge sharing. A sharing contract will encourage FFS farmers to agree (verbally or in written form) to share knowledge with a specified number of other farmers. The purpose of a field day to share what participants of FFS are learning with other farmers and to encourage non-participants to attend an FFS.

(ii) To ensure that FFS farmer-to-other farmers diffusion of knowledge is more systematic, facilitators should meet periodically with FFS graduates to ensure that knowledge is actually shared with groups of knowledge recipients (those people named on the sharing contrasts by FFS participants) to review key practices/knowledge and reinforce their learning.

It is strongly believed that if these suggestions are adhered to, a greater proportion of FFS farmers in the study area will share their knowledge on improved cocoa cultivation practices with other cocoa farmers.

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