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Full Length Research Paper

Analysis of extension activities on farmers' productivity in Southwest, Nigeria

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This study was conducted to analyze extension activities on farmers' productivity in South West Nigeria. The main objective was to investigate influences of extension contact on adoption level, sustained use of technology as well as farmers' productivity. Structured interview schedules as well as in-depth study devices were used to collect data, which were analyzed using appropriate descriptive and inferential statistics. The study revealed that there were significant positive correlations between age and adoption pattern (r = 0.16), age and soybean adoption level (r = 0.15), age and cassava adoption level (r= 0.14), organizational membership and extension contact (r = 0.21), factors affecting sustained use of maize and cassava technologies (r = 0.09) while a negative significant correlation exists between factors affecting sustained use of maize technology and extension contact (r = - 0.15). There were also significant positive correlations between attitude of farmers towards improved technologies and factors affecting the sustained use of maize technologies (r = 0.44). About 84% of variation in the sustained use of technology was explained by the independent variables included into the Probit model. Agricultural technologies developed and disseminated should meet farmers' socio-cultural, economic and environmental changing situations; Government should fund research and extension to enhance sustainable agriculture.

Key words: Analysis, extension, farmers, productivity.

INTRODUCTION

Governments at various levels and times have embarked on different programmes and policies to revitalise the agricultural sector, which is already stagnant and to cope with increasing demand of food due to increased population. Ruttam (1977) affirms that adoption of technologies and their sustained use depend on efficiency of technology development, dissemination and follow-up procedures.

In the same vein, Abalu (1988) noted that increasing farmers' productivity and income would require the development of appropriate technological method in research institutions and securing their transfer by means of an efficient extension system as well as sustaining their use. Research Institutions had not made much success in producing new technologies appropriate to the needs of African farmers in the post independence era (Malton and Spencer, 1984; Ogunsumi, 2004). To a large extent, failure has stemmed from inadequate understanding of small farmers' goals and resource limitations and over reliance on imported technologies from other regions (Spencer, 1986; Rewald, 2001).

Agricultural Development Programmes in Nigeria (ADP)

The integrated agricultural development programme that could also be described as agricultural development project started in 1975 as an enclave project which covered three small geographical areas Funtua in Kaduna, Gusau in Sokoto and Gombe in Bauchi states. These formed the first generation of ADPs in Nigeria. The programme gradually expanded with the establishment of other enclave ADPs in Lafia, Akungba, Bida, Ilorin, Oyo North and Ekiti-Akoko, in Kogi, Ondo, Niger, Kwara, Oyo and Ekiti states respectively (Ewuola, 1985 and Ladele, 1990).

The priority of agricultural development in Nigeria is to be self sufficient in food supply. In the past, the traditional system allowed for subsistence farming, where individuals were able to feed and there was self-sufficiency in basic food needs. Millions of small farmers produced enough food for themselves. Everyone was responsible for the food requirement of the family members and self and the surplus was marketed. Substantial quantities of export crops such as cocoa, groundnut, oil palm and coffee were also produced. These earned foreign exchange for the country.

The establishment of ADPs in all states of the Federation in Nigeria reformed extension services through the use of Training and Visit System (T and V). The T and V extension system as described by Benor and Baxter (1984) is currently implemented in a unified version. This was in response to the National Council on Agriculture (NCA) meeting held at Maiduguri in 1990. The use of the T and V approach in reaching farmers recognized the small-scale farmers as the focus for realising the development desired in agriculture (Norman, 1974; Falusi and Olayide, 1980 and Idachaba, 1980).

The goal of the Government in establishing the ADPs is to achieve self-sufficiency in food and fibre production for both human and industrial consumption. Rogers (1983), Ekpere (1994) and Eponou (1993) claimed that the process of technology development, transfer and use is dynamic. Consequently, issues relating to this must reflect the changes in such institutions through sustained use of agricultural technologies. Hence, proper technology development and transfer coupled with the adoption of the technologies are a must for agricultural development and sustainability of agriculture in the country. However the usual failure or collapse resulted especially as the funding agents withdrew their supports. The government could not sustain their existence. There were diversions and conflicts in their initial objectives. Currently they are operating at less than 10% of their capacities. The objectives were refocused where they were comercialised, yet they could not perform in most of the states. Therefore this study attempts to analyse extension activities and the influence on farmers' produc-tivity in the study area.

METHODOLOY

The population for this study consists of the Agricultural Development Programmes' contact farmers in the Southwest zone, Nigeria currently involved in farming system practices, such that had adopted recommended technologies (maize, cassava and soybean) disseminated to them within a period between 1990 and 1995 or below.

The multi- stage sampling procedure was used to select three states namely Oyo, Osun and Ondo where adoption (full or partial) of recommended technologies had been reported (IAR&T, 2000).

The second stage of the sampling procedure consists of purposive selection of two zones of ADP per State; however only one zone was eventually considered fit for Ondo State for logistic reasons. This represents about 60 and 50 percent of the zones in the States respectively. The zones are Saki and Ibadan/Ibarapa in Oyo State, Iwo and Ife/Ijesha in Osun State and Akure in Ondo State. Stage three consists of random selection of two blocks from the lists of blocks per zone where adoption of the technologies in question had taken place. The blocks selected were Saki, Igboho, Ido and Akinyele in Oyo State; Iwo, Ejigbo, Ijebu jesha and Atakumosa in Osun State; Ishua and Ibule in Ondo State.

Stage four comprised of four cells selected randomly representing 50% of the selected blocks.

Lastly, stage five was the purposive selection of three farmers' households who have sustained use of the technologies (in the three crops namely maize, cassava and soybean) and three farmers' households that abandoned the technologies from the list of farmers that had adopted the technologies. This was derived from a preliminary survey that was carried out with the assistance of Extension staff of the ADPs. This helped in identifying the farmers that had adopted selected technologies within a stipulated period of time.

The use of primary and secondary data was employed for this study. Secondary data were the information obtained from literature, project reports, official documents, publications, and consultation and library materials among others. Primary data were collected through the use of a structured and validated question-naire consisting of both open and closed-ended questions to elicit information from the target respondents. Trained enumerators who have the knowledge of the dialect of the clientele were used to assist in the collection of information required.

The Survey instrument was divided into seven major parts;

Part A: Demographic characteristics
Part B: Agricultural activities
Part C: Sources of information on agricultural practices and extension activities.

The instrument for data collection was subjected to pre-testing at Osogbo zone, which was not included in the sample, while validity and reliability tests, were carried out. Validity tests included:

(i) Face validity: To determine the extent to which the instrument measures what it is designed to measure, according to subjective assessment of experts and researchers in agricultural extension, rural development, agricultural economics, rural sociology and other related fields, relevant specialists in the Federal University of Technology, Akure and Institute of Agricultural Research and Training Ibadan.

(ii) Content validity: This was to measure the representativeness or sampling adequacy of the contents of rating scales. The reliability test was employed on 10 respondents with two different methods of test-retest that is, administration of questionnaire to the same respondents (in the pre-test) on two occasions at six weeks interval. The collected scores were subjected to Pearson Product Moment Correlation test statistics. The second method was the split-half method that gave the measures of the internal consistency of the instrument. The administered questionnaire had its items divided into two on odd and even number basis. The relationship between the two halves was calculated using Pearson Correlation test statistics. The value of 0.69 was obtained which makes the instrument reliable. The results of these tests were followed by the modification of the data collection instrument where necessary.

The independent variables of this study include the demographic characteristics of the respondents' such as age, gender, marital status, educational level, occupation, and contact with extension agents and farmers' attitude. The variables measured are:

Age: Actual age in years

Sex: Female or Male (Given a code of 1 to female and 2 to male)

Marital status: Single = 1, Widow = 2, Separated = 3 or Married = 4

Educational level completed: No formal Education = 1, Non-formal education = 2, adult education = 3 Primary School = 4, Secondary School = 5, Tertiary = 6, others = 7.

Occupation: The respondents were asked to indicate the primary occupation and secondary occupation out of the list of nine categories of occupation.

Farm Income: Respondents were requested to state their estimated income realised from sales of farm produce as well as the farm output the previous year.

Contact with extension agents: Respondents were requested to indicate one out of the frequencies of visit of extension agents or contact with extension agents. A score of 0 = no visit or contact at all. 1 = 1 - 4 times a year. 2 = 5 - 8 times a year. 3 = 8 - 12 times a year. 4 = More than 12 times a year.

The Dependent variable of the study is sustained use of adopted technologies. It was measured as not sustained/abandoned the use of adopted technology and still using/sustained the use of previously adopted agricultural technologies within a stipulated period of time. Scores were assigned as follows: Never used = 0. Abandoned use/Not sustained = 1. Still using/Sustained use = 2.

Sustained use of adopted technology index was then developed from the list of adopted technologies with maximum score of 54. Scores of 15 and below were regarded, as abandoned use group while respondents with scores of above 15 were the sustained use group.

RESULTS AND DISCUSSION

Demographic characteristics of respondents

Farmers within the study area are on the average fairly old with a mean age of 49 years. The fact that only 14.9% were below active age of 41 - 50 years and 48.12% were above it suggests that farmers were growing older. They are also not being succeeded by the younger generation.

Above suggests that younger people are abandoning the farm for greener pastures in cities and in other professions. This agrees with findings of Ewuola (1985). Lack of succession in agricultural profession might result into lower aggregate national food production resulting in food insecurity with less attractive option of food importation resulting in higher foreign exchange on food importation. In Adeyeye's (1986) study, involving co-operators and non-co operators in Oyo and Kwara states, overall average age was 50 years, however, this difference was not significant. Although the average age of respondents is slightly higher than that of this study it was significant at t – value.

Similarly in Angba's (2000) study it was concluded that the most virile age category were less involved in farming in the study area in his study on determinants of sustained use of selected technologies in Cross river state.

The greater percentage of respondents being males (91.35%) (Table 1) implies that majority of the clientele of ADP are males. The result of this study agreed with Angba (2000) where 78% were males shows that ADP's farmers were mostly males. The implication being that women were not considered as male counterpart in most of ADP programmes. Similarly, Abang et al. (1994) found that less than 15 and 32% respectively of the females in Cross River State had farms of their own.

Most of the farmers in the study area were married (89.90%). The fact that no farmers were single among the respondents denotes that the household members were needed in most agricultural operations; therefore the respondents could not afford to be single. Only 2.40% were either divorced or separated from their spouses, the likelihood of the later been that their spouses were engageed in other work area in other locations is envisaged. The study agreed with Igben (1988) affirming that the marital status of farmers' usually ranges between 94% in Plateau State to 99.5% in Imo. Though the study presents a slightly lower figure (89.90 percent for all the respondents), the fact still holds even in this study.

Farmers within the study area were educated on the average, since over 60 percent of the respondents completed at least secondary school education, precisely about 95% had informal and formal education in the study area. This supports their involvement in agricultural activities as information is disseminated through literature such as leaflets and bulletin or mass media. This further strengthens interaction between farmers and extension agents. An educated farmer would understand the need to source for vital information from the right sources. Major studies in agriculture in Nigeria Akinola (1983) and Ewuola (1985) supported the findings in this study.

These results agreed with this as for higher level of adoption among the respondents. The case of high educational levels among the respondents (60.58%) is easy in communicating farmers' problems to extension agents/researchers. Instructions for use of most improved and recommended practices require some level of education to read and understand (Figure 1).

Extension exposure in the study area

The extension activities in the study area are discussed. Frequency of direct or indirect contact with extension services were included as regards technologies transferred by the Agricultural Development Programme in Southwest, Nigeria. The improved technologies included in the study were on maize, cassava and soybean.

Table 2 shows the frequency of visit of extension agents to farmers among the respondents, the result revealed 76.44% had no contact with extension services for past three years while only 4.80% were not visited within the year. Only 27.40% were visited or had contact with extension services for 1 - 4 times in a year in the past 3 years. The respondents with more than 12 times contact with the extension services in the past three years were 59.60% while 31.73% had more than 12 times visits during the year.

The respondents were asked to rank their access to extension service in the study area. About 23.00% of the respondents had access more frequent than before, over 75.00% had access less frequent than before while only

Table 1. Distribution of respondents according to age, sex and marital status.

Variables	N = 33 Sustained users		N = 5 Abandoned users		N = 208 All Respondents	
	Freq	%	Freq	%	Freq	%
Age Group						
≤20 years	1	0.75	-	-	1	0.48
21-30	1	0.75	3	4.00	4	1.92
31- 40	16	12.03	10	13.38	26	12.50
41-50	62		39	52.00	101	48.56
51-60	43	46.62	20	26.67	63	30.29
61-70	9	32.33	3	4.00	12	5.77
Above 70	1	6.77	-	-	1	0.48
Mean		0.75		47.07		49.00
Range		49.71		20 -65yrs		20 -77yrs
Standard Deviation		30 - 77yrs		8.72		8.76
Sex						
Female	13	8.28	5	6.67	18	8.65
Male	120	9.77	70	93.33	190	91.35
Marital status						
Single	-	90.23	-	-	-	-
Married	120	90.23	67	89.33	187	89.90
Widowed	10	7.52	6	8.00	16	7.70
Divorced	3	2.26	-	-	3	1.44
Separated	-	-	2	2.67	2	0.96

Source: Ogunsumi, 2004

Table 2. Frequency of extension visit to farmers annually within the past 3 years.

Frequency of visit	N =133 Sustained users				N =75 Abandoned users				N= 208 All respondents			
	Visit within (1year)		Visit in ≥ 3 years		Visit within (1year)		Visit in ≥ 3 years		Visit within (1year)		Visit in ≥ 3 years	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
No visit	5	3.76	100	75.19	5	6.67	59	78.67	10	4.80	159	76.44
1 - 4 times	10	7.52	37	27.80	70	93.33	20	26.67	80	38.46	57	27.40
5 - 8 times	52	39.10	-		-		-		55	25.00	-	
9 - 12 times	-	-	-		-		-		-		-	
> 12 times	66	49.62	124	93.23	66	88.00	-	-	63	31.73	190	91.35

Source: Field Survey Data, 2005.

2.00% had access as before (Figure 2).The judgements of farmer respondents indicate a dwelling frequency of visit. This agrees with previous study of Agba (2000) where farmers- extension ratio keeps decreasing and need for Government intervention

Ownership of radio and television

All the respondents had opportunities of listening to radio. Majority of the respondents (76.92%) owned radio while only 0.65% owned television and 13.94% had no access to television (Table 3).

Frequency of listening and watching radio and television

The respondents were asked to indicate their access to and frequency of listening to radio and watching televi-

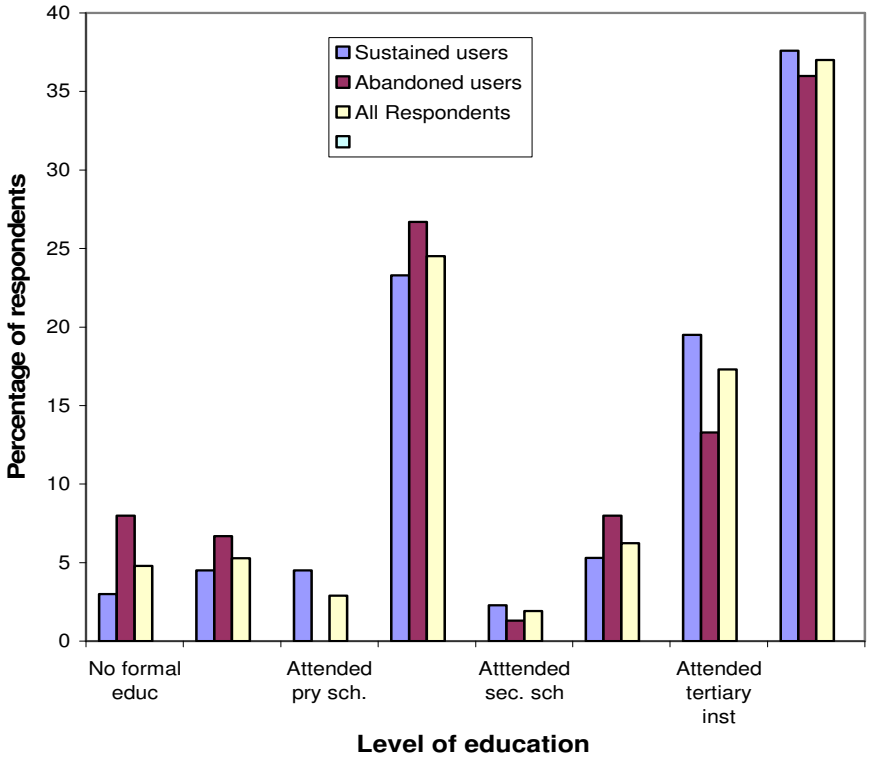

Figure 1. Distribution of respondents according to educational level.

Table 3. Radio and television access, ownership and mass media exposure among the respondents.

Characteristics	N = 133 Sustained users		N = 75 Abandoned users		N = 208 All respondents	
Access to radio and television	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
Radio	133	100.00	75	100.00	208	100.00
Television	9	6.77	10	13.33	29	13.94
No Access to television	19	14.29	10	13.33	29	13.94
Ownership	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
Own Radio	105	78.94	56	74.67	160	76.92
Own Television	9	6.77	9	12.00	18	8.65
Watch/listen television/radio (daily)	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
Watch Television	9	6.77	9	12.00	18	8.65
Listen to Radio	124	93.23	66	88.00	190	91.35
Frequency of reading agricultural news in papers (monthly)	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
Do not read	5	3.76	5	6.67	10	4.80
Read 1 times per month	108	81.20	66	88.00	168	80.77
Read 2 - 3 times per month	20	15.04	10	13.33	30	14.42
Read 4 times or more per month	-	-	-	-	-	-
Frequency of attending agricultural show last 3 years	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
≤1 time	5	3.76	5	6.67	10	48.07
2 - 3 times	104	78.19	56	74.67	160	76.92
≥ 4 times	24	18.05	14	18.67	38	18.27

Source: Field Survey Data, 2005.

Table 4. Farmers' suggestions on how to improve extension activities in the study area.

Suggestions	Sustained users		Abandoned users		All respondents	
	Freq	Rank	Freq	Rank	Freq	Rank
1.Increase number of extension agents in the area as against the present low farmer\ agent ratio	125	1st	70	1st	195	1st
2.Extension agents should include input package into their messages especially at the right time farmers need them	97	2nd	31	3rd	128	2nd
3.Better condition of service for EAS especially provision of mobility as it used to be during world bank era	58	3rd	32	2nd	90	3rd
4.Have regular meetings with farmers	58	3rd	32	2nd	90	3rd
5.Form cooperative societies with farmers for regular access to inputs	20	4th	4	4th	24	4th

Source: Field Survey Data, 2005.

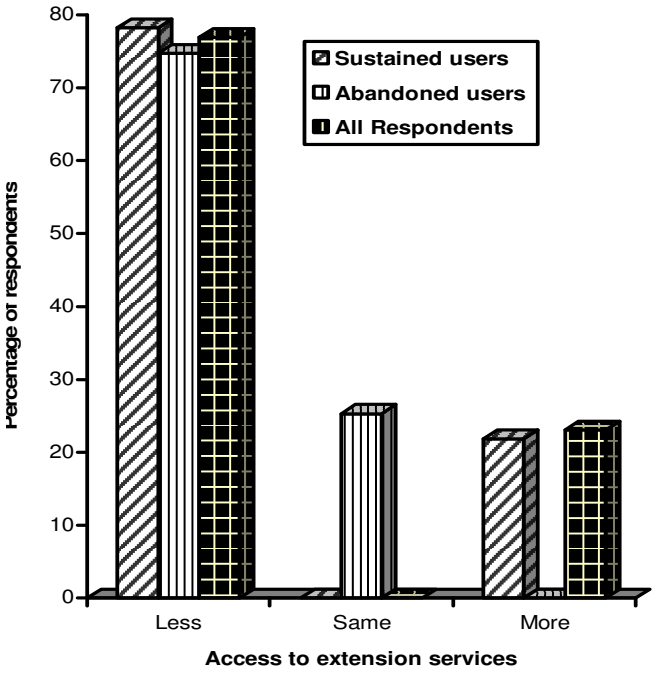

Figure 2. Distribution of respondents according to access to extension services

sion. Majority of the respondents (91.35%) listened to radio daily while only 8.65% watched television daily (Table 3).

Frequency of reading agricultural news in major news paper and attending to agricultural show

The respondents were also asked to indicate frequency of their reading Agricultural news from major newspapers. The results show that only 14.42% of respondents read agricultural news 2 - 3 times in a month while 80.77% read agricultural news from newspapers for once in a month and 4.80% did not read agricultural news from newspapers. In all 95.20% of the respondents read newspaper at least once in a month.

Similarly 48.07% attended agricultural show at least ones the last 3 years while 76.92 attended it for 2 - 3 times and 18.27% attended for 4 or more times in the last 3 years (Table 3).

Ranking suggestions on how to improve frequency of farmers with extension services

Table 4 shows the ranking of various suggestions given by the farmers (respondents) on how to improve frequency of farmers' contact with extension services. Increasing the number of extension agents was the most highly ranked suggestion on ways of improving extension services. The suggestion that extension agents should include input package into their monthly messages was ranked 2nd by the respondents.

Access to mobility and better conditions of services for extension agents was ranked 3rd among the respondents. The respondents ranked having regular meetings with extension agents as third suggestion to improve farmers' relationship with extension agents. Also forming farmers into cooperative societies to exchange ideas with extension services ranked 4th by the respondents (Table 5).

Table 4 shows that there were significant relationships using probit model. The results shows the contributions of selected variables to the dependent variable, the extension contact of the respondents shows that there was a significant relationship. It gave a coefficient of -0.6214056363E-01, mean of 3.38, the slope (b/standard error) of -3.59 and P value of 0.0003. Other variables fitted into the model included age, sex, marital status, maize technology adoption level, Soybean technology adoption level, cassava technology adoption level., factor

Table 5. PROBIT results of selected variables and sustained use.

Variable	Coefficient	Standard Error	b/St.Er	P[|Z|>z]	Mean of X
AGES	-.5761170533E-02	.13674369E-02	-4.213	.0000	48.759615
SEX	-.3959908645E-03	.20269648E-03	-1.954	.0507	-3.8894231
MARS	.3002287302E-04	.90775220E-04	.331	.7408	-23.115385
EDUC	-.4960411806E-02	.25388688E-02	-1.954	.0507	8.2788462
MTOT	.1015929039	.10020025E-01	10.139	.0000	7.8846154
STOT	-.1386228341E-01	.85195633E-02	-1.627	.1037	7.1394231
CTOT	.9096546339E-01	.86523399E-02	10.513	.0000	7.8846154
FACSOY	.4996445953E-02	.44060440E-02	1.134	.2568	17.274038
FACMAIZ	-.1515092480E-01	.59898846E-02	-2.529	.0114	14.798077
EXTCONT	-.6214056363E-01	.17283288E-01	-3.595	.0003	3.3750000
ORGMEMB	-.1705673845E-01	.91170746E-02	-1.871	.0614	5.8509615

Source: Ogunsumi, 2004
Dependent variable =Sustained use. Dep. var. = PROBIT Mean= .639423076 , S.D. = .4813263216
Model size: Observations = 208, Parameters = 11, Deg.Fr.= 197 Residuals: Sum of squares= 7.670944508 , Std. Dev. =.19733
Fit: R-squared= .840044, Adjusted R-squared = 83192 .Model test: F [10, 197] = 103.46, Prob value = .00000
Diagnostic: Log-L = 48.0710, Restricted (b=0) Log-L = -142.5464. LogAmemiyaPrCrt. = -3.194, Akaike Info. Crt. = -.356
EXTCONT= Farmers contact with extension agents; FACMAIZ=Factors affecting maize technology sustainability
FACCASS = Factors affecting cassava technology sustainability; FACSOY=Factors affecting soybean technology sustainability
SCMTOT= Total adoption index for the selected technologies; STOT= Soybean adoption index; CTOT= Cassava adoption index
MTOT= Maize adoption scores; CTO cassava total Adoption score
NS.ATp value, 0.05; *= sig at p⊆0.05 level;

Table 6. Correlation matrix showing relationships among selected variables.

	AGE	ORGAMEMB	EXTCONT	FACMAIZ	FACTCASS	FACSOY	ATT	SCMTOT	STOT	CTOT	MTOT
AGE		-0.03	0.06	-0.08	0.04	-0.91	0.04	0.16**	0.15*	0.14*	0.13
ORGAMEMB	-0.30		0.21**	0.01	0.06	0.02	0.03	-0.02	-0.08	0.03	-0.01
EXTCONT	0.06	0.21**		-0.15*	-0.03	-0.02	-0.10	0.06	0.01	0.09	0.06
FACMAIZ	-0.08	0.01	-0.15*		0.09**	0.88**	0.44**	-0.11	-0.09	-0.08	-0.12
FACCASS	0.00	0.06	-0.03	0.90**		0.84**	0.34**	-0.09	-0.08	-0.08	-0.09
FACSOY	-0.9	0.02	-0.02	0.89**	0.84**		0.33**	-0.12	-0.09	-0.09	-0.13
ATT	0.04	0.03	-0.10	0.44**	0.34**	0.33		-0.09	-0.07	-0.09	-0.07
SCMTOT	0.16*	-0.02	0.06	-0.11	-0.09	-0.12	-0.09		0.88**	0.88**	0.93**
STOT	0.15*	-0.08	0.01	-0.09	-0.08	-0.09	-0.07	0.88**		0.60**	0.74**
CTOT	0.14*	0.03	0.09	-0.08	-0.08	-0.09	-0.09	0.88**	0.60**		0.74**
MTOT	0.13	-0.01	0.06	-0.12	-0.09	-0.13	-0.07	0.93**	0.74**	0.74**	1.00

Key: Age = age of respondents; ORGAMEMB = Respondents' membership into organization
EXTCONT = Farmers contact with extension agents; FACMAIZ = Factors affecting maize technology sustainability
FACCASS = Factors affecting cassava technology sustainability; FACSOY = Factors affecting soybean technology sustainability
ATT = Farmers' attitude towards improved technology; SCMTOT= Total adoption index for the selected technologies
STOT = Soybean adoption index; CTOT = Cassava adoption index
MTOT = Maize adoption scores;; NS.at P-value > 0.05; * = sig at p⊆ 0.05 .

tors affecting sustained use of soybean technology, factors affecting sustained use of maize/cassava technology and organization membership. The model gave an R-squared of 0.84 with Prob value of 0.0000. Furthermore the results of the correlation matrix show there were significant relationships between extension contact and some other variables such as organizational membership at P = 0.05 and factors affecting sustained use of maize technology at P < 0.05 level. Other variables were not significant at P = 0.05 level (Table 6). The access to

extension service in the study area as rated by farmers is an indication of low extension agent to farmer ratio. Majority of the respondents (91.35%) listened to radio daily, thus agricultural information can be disseminated to large proportion of the farmers. The extension contact of sustained users and abandoned users were similar but the difference in the average score was significant.

Extension contact showed a significant relationship with the sustained use index. The joint contribution of other variables (educatioinal level and factors affecting sustained use of technology) gave 84% explanation to variation in sustained use of technology.

The policy implication is that extension contact contributes to a great measure sustained use of technologies. The situation where ADPs are going commercial and extension outfit being secondary will have implication on agricultural activities in the study area.

Conclusion

Majority of the respondents (60%) had contact with the extension services for more than 12 times in the past years while only 31.10% of the respondents had such frequency of visits within the year. An implication of decrease in extension service.

All the respondents had opportunity to listen to radio. About 77% of the respondents owned radio while only 18.27% owned television. Only 18.27% read agricultural news in major newspapers while majority did not respond. Farmers suggested that the numbers of extension agents to farmers should increase as a way to improve extension services in the study area. Also input package inclusion into monthly messages ranked second for the respondents. This will allow them to have access to technology as well as the input required to practice it.

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