BIU Journal of Basic and Applied Sciences 4(1): 91 – 100, 2019.

ISSN: 2563-6424

EXTENSION DELIVERY: THE BANE OF RUBBER PRODUCTION IN EDO SOUTH AGRO-ECOLOGICAL ZONE OF NIGERIA

ALAKPA, S. O. E.
Department of Agricultural Economics and Extension Services, Benson Idahosa University, Benin-City, Nigeria
E-mail: salakpa@biu.edu.ng

ABSTRACT
Rubber yield has been on the decline and below expectation due to the gap created by lack of extension services delivery. This study examined the awareness level of Agricultural Extension service delivery in rubber production in Edo South ecological zone of Nigeria. The main objective was to determine the respondents' awareness level of improved technologies and adoption rate. A sample size of 150 farmers was used from the list of rubber farmers obtained from Edo State Ministry of Agriculture and Rural Development and Tree Crop Unit of the Federal Ministry of Agriculture. Valid questionnaire used for the study were 137. A multi-stage sampling technique was adopted for the study. Data collected were analyzed using Frequency distribution, Percentage scores and Linear Regression. The result of the study indicated, that majority of the respondents (77.0%) were above 41 years of age. Greater proportion of the respondents (82%) had primary school education and could therefore be said to be literate. Most (66%) of the respondents had a household size above 9(nine). Respondent's contact with Agricultural extension agent was quiet low (18.2%). This means that as much as 76% of the respondents were practically without the necessary information and improve input that could facilitate productivity and improve income which was below N20,000 monthly for more than half of the respondents (55.3%). F value was statistically significant at 5% probability level and the t-value indicated that Ns were not significant. It was recommended that extension delivery should be given adequately priority to empower the farmers to bridge the deficit gap. Regular training should also be organized and more youth should be encouraged to go into rubber production.

KEYWORDS: *Extension, Awareness, Rubber farmers, Adoption, Edo South*

INTRODUCTION
Rubber (*Hevea brasiliensis*) is a dicotyledonous plant in the family Euphorbiacea (Agwu, 2006). It is cultivated in most part of Southern Nigeria as a result its suitable vegetative and climatic conditions conducive for its production. Rubber production in Nigeria dates back to 925 where thousands of hectares of rubber estates were established, but were predominantly owned by foreigners (the Europeans) and were located in the Southern part of the country. The yield of rubber has been

observed to be on the decline as a result of the gap created by lack of awareness of extension service delivery which is programmed to give rise to the effective dissemination of information on new and improved management practices. The consequence of the poor extension delivery culminated in the negative impact on production and led to reduce export which also affected the nation`s economy adversely (Agwu 2006 and Giroh *et al.*, 2007). Commenting on the relevance of Extension and the Extension worker, Oladele and Fawole (2007) described Agricultural Extension worker the "conduit pipe" through which information on research findings are made known to the farmers for implementation. This in turn improves their production capacity, income generation and living standard of farmers. Oladele and Fawole (2007) also identified the extension work as the most important public service because of the several roles it plays in Agriculture and rural development.

The relevance of rubber is indisputably high economically considering what it can be used to produce; which includes its latex being used for vital material in the automobile industry such as the manufacture of tyres, car bumpers, transmission belt, car mat, seats, adhesive, baby feeding bottle teat, condom, domestic and industrial gloves, balloons, balls, eraser among others (Abolagba and Giroh, 2006). It should be noted also that rubber tree produces seeds and wood, which are also of high economic value to the grower (farmer). Agwu (2006) highlighted that cake extracted from rubber seed after the extraction of oil can be used for the production of livestock feeds. The author also added that rubber seeds when processed could produce oil alkyd resins which is used for the production of paints, soap, skin cream and hair shampoo.

In enhancing the production of rubber, Cartwright *et al* (2002) further explained that the relevance of Extension when properly implemented would assist farmers in the rural communities to get relevant technical information that could help farmers to be more productive in their field of endeavour. Extension Service delivery also lead to the economic emancipation of the farmers, through the introduction of various programmes in Agriculture, forestry (where rubber belong), fishery, family and community development. This would empower them and create avenues through which their production output improves and boost their income generated and improved livelihood. Extension indeed has help individuals in various communities to succeed economically.

Omotayo (2005) and (Munyua 2000) highlighted that Agricultural Extension relies greatly on information sourced from the researcher and introduces synergy between the extension delivery stakeholders (ie. the farmer, extension agents, researcher and other actors) in the Agricultural Knowledge and Information System (AKIS) but when the farmers are deprived of the information that would have improves their knowledge and increase their performance level. The absence of adequate knowledge cause production to drops which also leads to the reduction of the expected income. The resultant effect introduction of dreaded poverty surge which is against the goals of extension delivery.

Ajokporise and Akpere (2010) in their study found that only 19.2% of the 120 respondents used for their study had

contact with government agencies specifically extension agent who were supposed to furnish the farmers with relevant technical information that could improve their production and impact the farmers positively. The authors strongly recommended that the government should provide effective extension services that could reach the farmer and also provide farm inputs such as planting materials as a way of encouraging farmers to plant rubber. Considering the low performance of Extension, Imarhiagbe *et al.* (2015) also recommended that extension services should be intensified to disseminate credible technical information, and improved technical assistance to rubber farmers by the extension practitioners on regular bases. They also recommended empowering the extension agents through improved skills (training).

Abolagba and Giroh (2006), complained that Rubber production has been on the decline over the years, from 155,000 metric tonnes in 1991 to 46,000 metric tonnes in 2004. This is brought about by several factors including over-aged trees and lack of adequate extension service delivery that could give the necessary information that would have improved production, etc. (Mgbeje, 2005). Complaining Further Igbenosa (2008) asserted that several improved technologies that could ameliorate the decline in rubber production has been generated, but there no evidence of improved adoption that could lead to increased production. Igbinosa, (2008) also asserted that in spite of the problems of the decline in natural rubber production, various research in rubber has been going on. However, there is no evidence currently to show if farmers in the study areas were aware of these new improved technologies generated by researchers, neither is there empirical support for their adoption or usage. This bring to light the fact that the farmers may not be aware of the new innovations hence no adoption. This study will attempt to provide empirical information relevant to making appropriate recommendations for solving the problems of information dissemination that could boost rubber production in the study area.

The main objective was to determine the respondents' awareness level of improved technologies and adoption rate.

1. Are there new innovations in rubber technologies that can improve rubber farming in the study area? If yes;
2. Did extension delivery in the study area improve the adoption of technology?
3. Are the new technologies made known to the farmers to enhance adoption (Are they aware)?

Objectives

i. Determine farmer's level of awareness of improved technologies in the study area
ii. Determine the level of extension contact the farmers had with the farmers.
iii. Ascertain whether the new technologies were adopted by the farmers

METHODOLOGY

Study Area

Edo state is made up of three (3) Senatorial zones namely: Edo North, Edo Central and Edo South. However, Oredo and Egor Local Government Areas which are part of Edo south Senatorial zone were not sampled because they are not agriculturally relevant and productive. This is as result of their fast growing

developments and urbanization tendencies. According to NPC, (2006) Edo State population stands at 3,233,366 person with a land mass spanning through of 19,819km^2. It has a population density of 163.14. The states lies between longitude 050 04' North and 060 43' East and latitude 050 44' and 070 34' North. It is bounded by Kogi State in the north, and Delta State by the south. At the west, it is bounded by Ondo State while Kogi and Anambra States on the eastern side. It consist of 18 Local Government Areas. It has two major vegetation belts namely: the Forest Belt of the south and central parts; while the Guinea Savannah belt sparse through the northern part of the state. The mean annual rainfall is between 127cm and 152cm in the northern part of the state, while the southern part records 252cm–254cm of rainfall. The average temperature ranges from a minimum of 24°C to about 33°C (FOS, 1994).

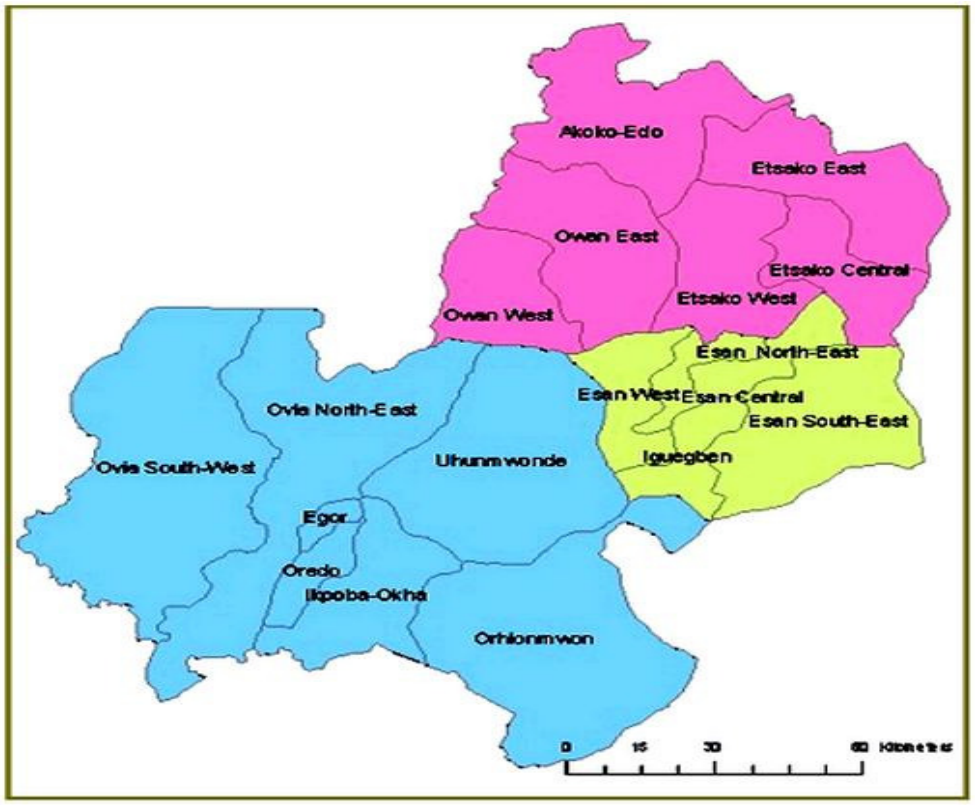

Fig. 1: Map of Edo State, Nigeria
Source: Ogbeide (2015)

Sample Collection

The focus of the study was on extension delivery in rubber production; it specifically concentrated on Extension being the bane of rubber production in Edo south agro-ecological zone of Nigeria. The study was carried out in three (3) local government areas of Edo South Senatorial Zone which include Ovia North-East, Ovia South-West and Uhunmwode. The rubber farmers used as the sample frame were 150 small scale farmers in the study area. The list of rubber farmers was obtained from Edo State Ministry of Agriculture and Rural Development and Tree Crops Unit of the

Federal Ministry of Agriculture. However, 137 of the farmer's questionnaire were found valid for analysis. A multi-stage sampling technique was deployed for the study as follows: One senatorial zone was purposively selected from the three senatorial zones of the state, because of the climatic condition and vegetation of these areas which favours the growth and establishment of rubber production. Three local government areas sampled were from farmers known to be highly involved in rubber production and are known small scale rubber farms in the area. Six (6) communities (i.e. two from each of the local government area producing rubber were further purposively sampled) from the list of the registered communities farmers provided by Tree Crop Unit of Edo State Ministry of Agriculture and Rural Development and Tree Crops Unit of the Federal Ministry of Agriculture. From the list provided by the above listed establishments; twenty-five (25) rubber farmers were randomly selected in each community, making a total of 150 farmers used for the study. The primary data were obtained through the use of well-structured questionnaire to elicit information from the (farmers) respondents in the study area. Data were collected with the assistance of Edo State Agricultural Development project (EDADP) and staff of the Rubber Research Institute of Nigeria (RRIN), Iyanomo-Benin (ie. the establishment`s extension workers) who were trained to administer the questionnaire. Data on socio-economic characteristics were elicited from the respondents include: Age, educational level, household size and the income including their level of awareness and adoption of improved rubber technologies and the constraints faced by the farmers in the adoption of these technologies. Oral interview was also used to obtain information that were not captured by the questionnaires and farmers who were not literate.

Measurement of variables: Contact with extension was measured by the number of times respondents were visited by Extension agents. Sources of information on improved rubber production practices; respondents were asked to indicate which of the following eight information sources were available to them and by ticking the one that was most appropriate; Ministry of Agriculture/ADP and RRIN organized Workshop/ Seminar which they participated in and acquired knowledge for their production.

Other sources of information were Trade fairs, Newspaper, Rubber Estates, Radio/TV, Friends and Cooperative societies. Adoption of Rubber Technology: This was measured by advising the respondents to tick either of the following options; aware, not aware, adopted and never adopted for each of the eleven (11) improved technology associated with rubber production in the study area. Adoption score were obtained by summing up the proportion of eleven technologies used.

Data Analysis

Factors that influenced the adoption of rubber technology were evaluated using percentages, multiple regression analysis. Four functional forms (Linear, Semi-log, Exponential and Cobb-Douglas) were tried using ordinary least square techniques (OLS). The estimated functions were evaluated in terms of the statistical significance of R^2 as indicated by F-value, the significance of the

coefficients as given by the t-value, the signs of the coefficient and the magnitude of standard errors.

RESULT AND DISCUSSION

Table 1 shows that most (39.5%) of the respondents were advanced adults of the age 60 years and above. Respondents within the age range of 31-40 years and 41-50 years both recorded equal number/ percentage of 19.7(%). Education Level: Table 1 also indicated few of the respondents (16.8%) having no formal education but majority (52.6%) had post primary education and only 5% had tertiary education. Summarily, most of rubber farmers (83%) had at least primary education, which shows appreciable literacy level of the respondents. It is expected that the level of adoption of innovations or technologies in rubber production would be appreciative. Onomolease *et al.* (2001) reported the educational level of farmers being positive and significant effect on farm productivity and adoption in Edo State, Nigeria. Table 1 also indicated that most (64.9%) of the respondents had a household size greater than 9 persons with only 44.5% of the respondents earning a monthly income that was more than N20,000. Large house size in the study area suggests availability of farm labour among farmers which could lead to increased productivity in rubber production.

Table 1: Demographic Characteristic of Respondents (N=137)

Characteristics	Category	Total
Age Group	Frequency	Percentage
21-30	5	3.6
31-40	27	19.7
41-50	24	17.5
51-60	27	19.7
>60	56	39.5
Sex		
Male	137	100
Female	0	0
Marital Status		
Married	135	98.5
Single	2	1.5
Education Status		
No Formal Education	23	16.8
Primary Education	35	25
Post Primary Education	72	52
Tertiary Education	7	5.1
House hold Size		
1-4	2	1.5
5-8	46	33.5
9-12	62	45.3
13-16	20	14.6
>16	7	5.1
Income		
<10,000	21	15.3
10,000 -20,000	55	40.2
>20,000	61	44.5

Table 2: Respondents Contact with Extension Agents

Variety	Frequency	Percentages
Response	Whether Visited or Not	
Yes	25	18.2
No	112	81.8
Frequency of Visit		
Never	112	81.8
Twice	25	18.2

Table 2 shows the distribution of respondents on the basis of extension agents' contact with rubber farmers. The result indicated that only 18.2 percent (%) of the respondents had contact with extension agents which invariably shows that extension delivery in the study area was very poor; this is in consonance with Agwu 2006 and Ajokporise and Akpere (2010) who asserted that low Extension contact was a great set back to the production of rubber; he found that only 24 % and 19.2% (respectively) of the farmers in the study area had contact with extension agent. Low or poor extension

contact is definitely a prerequisite for low rubber production in the study area.

Table 3 shows results on technology awareness and respondents adoption capacity. The table indicated that respondents in the study area lacked technological information from government agencies such as ADP/Ministry of Agriculture and Rubber Research Institute of Nigeria (RRIN); which are agency charged with the responsibilities of developing appropriate technology and disseminating same to the rubber farmers. The absence of extension agents discourages agricultural production (rubber inclusive); Mafimisebe and Mafemisebi (2008) highlighted that contact with extension workers is a prerequisite improved and high productivity. It aso increase their income because they are known to facilitate farmers' adoption of farm new innovations from research stations which leads to high productivity. The result of this study indicated that 17.5% of the respondents obtained information from other sources such as rubber estates (3.6%), cooperative societies and only 0.7% from Rubber Research Institute of Nigeria (RRIN) organized workshop/seminar. The result is a clear evidence of inadequate dissemination of technological information and adoption. The technologies adopted in the study area were weeding, (100%) fire trace (92.7) and pruning (49.6%). Igbinosa (2008) recommended that regular weeding of rubber plantations should be encouraged because good field hygiene creates airy and less humid environment which leads to the reduction of microbial attack on rubber latex thereby improving production the eventually leads to more income generation.

Table 3: Technologies awareness and Respondents' Adoption Capacity

Technology	Awareness Frequency	Percentage	Adopted Frequency	Percentage
Weeding	137	100	137	100
Fire trace	130	94.9	127	92.7
Pruning	72	52.6	68	49.6
Holing/dibbling	15	10.9	14	10.2
Intercropping	3	2.2	1	0.7
Improved clones of rubber {(NIG) 800 and 900 series}	-	-	-	-
Spacing (6.7m x 3.4m)	-	-	-	-
Thinning	-	-	-	-
Cover cropping	-	-	-	-

Table 4 explained the determinants of adoption of rubber technology in the study area. Based on these statistical, economic and econometric criteria, the linear form was selected as the best fit and result is presented in table 4. From the table, it was observed that age, total innovations that the farmers were aware of and their farm size carry the expected signs. Also, 83.8% variation in the regress and (adoption of rubber technology) was explained by the regressors. Similarly, the F value was statistically significant at 5% probability level indicating model fitness.

Table 4: Result of linear regression showing relationship between adoption and selected variables

Variable	Coefficient	Standard error	t. value
Constant			
X_1 = Farming experience	.330	.259	1.275Ns
X_2 = Household size	-.003	.005	-.667Ns
X_3 = Times visited by extension agents	-.040	.036	-1.108Ns
X_4 = Educational level	-.002	.040	-.040Ns
X_5 = Age	-.077	.043	-1.792Ns
X_6 = Income	.013	.058	.224Ns
X_7 = Total innovations aware of	-.011	.046	-.230Ns
X_8 = Farm size	.986	.040	24.400***
F value 90.389***			
R^2 .921			
R^2 .848			
R^2 adjusted .838			

*** (significant at 5% probability level)
Ns, not significant

CONCLUSION AND RECOMMENDATIONS

The study identified lack of awareness as the major reason why adoption of improved technologies in the study area were hindered. The most adopted technology were weeding, creation of fire trace and pruning which were regular agronomic practices in rubber production. The use of improved clones of rubber was not adopted in the study area due to lack of awareness. Contact with Agricultural Extension practitioners was not a regular phenomenon; thereby impeding adoption processes and reducing their expected improved yield and income. In view of the above findings, the study recommended that Agricultural Extension delivery activities should be vigorously encouraged, increased and improved. Collaborative effort should be made by all the extension delivery stakeholders in the area in order to increase extension contact which will improve the expected awareness. Regular training should be organized for the rubber farmers in order to improve their capacity for improved productivity, yield and income. Youth involvement in rubber production should be seriously encouraged order to sustain rubber production in the area.

REFERENCES

Abolagba, E. O. and Giroh, D. Y. (2006). "Constraints to sustainable development of rubber industry in Nigeria: A case study of Delta state". *Moor Journal of Agriculture*, 7(1): 42-48.

Agwu, A. E. (2006). Enhancing Natural Rubber (*Hevea brasiliensis*) Production through Extension service delivery in South West Agricultural Zone of Nigeria. *Journal of Agriculture, Food, Environment and Extension,* 5(2): 7-16.

Ajokporise, D. and Akpere, L. P. (2010). Constraints to Rubber Production in Sapele Local Government Area of Delta State, Nigeria. *Journal of Research in National Development*

Volume 8 No 2, available in http//www.transcampus.org

Igbinosa, O. F. (2008). Assessment of Factors Affecting the Adoption of Rubber Technologies among Smallholders in Edo State. M.Sc. Thesis, University of Benin, Benin City.

Imarhiagbe, P., Umar, H. Y and Agbonkpolor, B. N (2015). Factors associated with discontinuance in adoption of rubber production technologies among small scale farmers in Edo State, Nigeria, *Sky Journal of Agricultural Research,* 4(8): 156 – 160. Available online http://www.skyjournals.org/SJAR

Giroh, D. Y., Ephriam, I. J., Fannap, D. F. and Ogwuche, P. (2007). Quantitative analysis of adoption of natural rubber production technology among farmers in southern Nigeria, *Journal of Tropical Agricultural Research*, 21: 11-18.

Mafimisebe, T. E. and Mafemisebi, O. E. (2008). Technologies Uptake by Farmers Cultivating Fadama Sugarcane in South-West, Nigeria: Implication of Productivity, Produce and Price and Farm Income. Proceedings of the 4th Annual Conference of the School of Agriculture and Agricultural Technology, Federal University of Technology, Akure, 21st May, 2008, pp. 223-231.

Mgbeje, B. I. A. (2005). The Nigerian smallholder in the African rubber programme, A paper presented at the workshop for rubber smallholder. Federal ministry of commerce at Motel Benin Plaza, Benin City, P.19.

Munyua, H. (2000). Application of Information Communication Techniques in the Agricultural Sector in Africa: A Gender Perspective. In Rathgeba, E, and Adera, E. O. (Eds). Gender and Information Revolution in Africa. IDRC & ECA. 85-123

National Population Commission (2006). *National Population Commission Diary: Issues on 2006 Census,* National Population Commission, Abuja.

Ogbaide, O. A. (2015). Map of Edo State Showing the Local Government as https://www.researchgate. net/figure/Map-of-Edo-State-showing-the-Local-Government-Areas_fig1_278017631.Uploaded June 15th 2015, Retrieved 27th of March 2019.

Oladele, O. I. and Fawole, O. P. (2007). Farmers' Perception of Agriculture Technologies in South-Western Nigeria. *Journal of Human Ecology,* 21(3): 191-194)

Omotayo, O. M. (2005). ICT and Agricultural Extension: issues in transferring Agricultural technology in developing country. Proceeding of 3rd Annual Conference of AESON Ilorin. pp. 132-135.

Cartwright, S., Case, P. and Gallagher, T. (2002). Extension's Role in Responding to Community Crisis: Lessons from Klamath Falls, Oregon. *Journal of Extension; published December 2002. Vol. 40 No. 6.* Available www.jeo.org. Retrieved of June, 2018.