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EFFECTIVENESS OF AGRICULTURAL EXTENSION MODELS IN FOOD CROP PRODUCTION IN CROSS RIVER STATE, NIGERIA

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ABSTRACT

This study assessed the effectiveness of agricultural extension models in food crop production in Cross River State. Specifically, the study described the socio-economic characteristics of the respondents, identified the level of extension model activities in crop production and analyzed the effectiveness of agricultural extension models in the study area. A multi-stage random sampling technique was used in selecting respondents for the study. Data were collected using a structured questionnaire. Descriptive statistics such as frequency distribution, mean scores, percentages and standard deviation were used for the study. The result showed that the respondents had a mean age of $\bar{x}$ = 5. Majority (77.00%) of the respondents were married. Furthermore, the result of the socio economic characteristics of the respondents also showed that a negligible proportion (17.20%) of the respondents had no formal education. About 16.10% had primary level of education. A fair proportion (45.00%) had secondary level of education. Also, about 21.70% of the respondents had tertiary level of education. These implied that the respondents were educated. Educational attainment would make the farmers more responsible and responsive to agricultural extension models, programs and policies. The result also indicated that 79.50% of the respondents were farmers. These implied that farming was the major means of livelihood in the area. The result of distribution of respondents based on extension models available in the area showed that “training and visit” extension model was ranked first with standard deviation of 1.65; this means that the “training and visit” model of extension had a high level of acceptability in ensuring food crop production. Contact farmer model was ranked 2nd, with standard deviation of 1.28. This means that farmers had contact with fellow farmers faster than extension officers. In the same vein, video-based extension model was ranked 8th with standard deviation of 0.64. The result of the effectiveness of extension model revealed that mean ($\bar{x}$) of 3.58, 3.35, 3.49, 3.20 affirmed that agricultural extension models populated by extension officers are effective in food crop production in the study area. Similarly, individual persons oriented model such as mass media model with mean of $\bar{x}$ = 3.21 was very effective in food crop production. These results implied that agricultural extension models were effective in food crop production. The study concluded that the agricultural extension models are very effective and positively related to food crop production.

Key words: Agriculture, Cross River, Effectiveness, Extension models, Food crop, Production

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INTRODUCTION

Men and women have been growing crops and raising livestock for approximately 10,000 years [1]. Throughout this period, farmers have continually adapted their technology, assessed the results through communicating, most of this communication had taken the form of verbal explanations and practical demonstrations, but some information took a more durable form as soon as systems of writing were enveloped [1]. Details of agricultural practices have been found in records from ancient Egypt, Mesopotamia and China going back more than 3,000 years [2].

In most regions of the world, family food crop production systems abound. There is rise in poverty globally as a result of the recent increase in food prices which has put many in poverty and hunger [3]. Many households have been forced to adapt several methods of survival like homestead farming, mini farming structure, sack farming, intensive and semi intensive farming methods.

According to Ben [4], it is not known where and when the first extension activities took place; it is known, however, that Chinese officials were creating agricultural policies and documenting practical knowledge and disseminating advice to the farmer at least 2,000 years ago. Also, Ben [4] noted an example indicating that in approximately 800BC, the ministry responsible for agriculture under one of the Zhow dynasty emperors also leased agricultural equipment to farmers, built grain stores and supplied free food during times of famine. With the global population expected to exceed 10 billion by 2050, there is need to increase food production [5].

Agricultural extension is a service or system which assists farmers through educational procedures in improving farming methods and techniques, increasing production efficiency and income, bettering their levels of living and lifting the social and educational standards of rural lives [6]. The effectiveness of these extension models depends, however, on factors such as inherent socio-economic, famers' needs, resource availability, commitment of extension officers and logistics [7].

MATERIALS AND METHODS

This study was conducted in the Southern zone of Cross River state. The Southern Agricultural Zone, also known as the Calabar zone is made of seven blocks, namely: Calabar municipality, Calabar south, Akpabuyo, Odukpani, Akamkpa, Bakkasi and Biase. It has a coordinate of 45^{o} 5N, a latitude of 4^{o} 57" south of the equator and longitude of 8^{o} 19" East of the Greenwich meridian. Agriculture is the main-stay of the people in this zone. Crops grown are oil palm, plantain,

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vegetables, cassava, rubber, maize amongst others. Also, the people practice fishing, processing, marketing of farm produce and menial labour [8]. This study assessed the effectiveness of agricultural extension models in food crop production and consumption in Cross River State. Specifically, the study sought to identify the socio-economic characteristics of respondents in Cross River state, assess the extension activities in the study area and analyze the effectiveness of extension models in the study area.

A multi-stage sampling technique was used for the study. Stage one involved the purposive selection of the southern agricultural zone out of the three zones in the state, keen in agricultural production, especially crops. Second stage was a random selection of three blocks out of the seven blocks in the zone namely Akampka, Odukpani and Akpabuyo. These blocks have most food crops produced in large quantities. The third stage was the random selection of three cells from each of the selected blocks. A total of nine (9) cells were selected based on the intensity of crop production activities in the cells. Finally, the fourth stage involved random selection of ten (10) respondents each from the 18 cells, making a total of 180 respondents used for the study.

RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents

The result in Table 1, shows the distribution of respondents based on socio-economic characteristics. From the result, the mean age of the respondents was $\bar{x}$ = 5, this implied that the respondents in the study area were still young, active and are expected to adopt extension models required to increase crop production with ease. This result confirms the findings of Effiong and Aboh [9] that majority of the farmers in Akpabuyo are still in their active age, and are actively involved in agricultural extension services and activities. Age determines the level of involvement in agricultural extension models in Akwa Ibom state [10].

The result also showed that negligible proportion (17.20%) of the respondents had no formal education. About 16.10% had primary level of education. A fair proportion (45.00%) had secondary level of education in the area. Also, about 21.70% of the respondents had tertiary level of education. This implied that the respondents were educated. Educational attainment would make the farmers more responsible and responsive to agricultural extension models, programmes and policies. It is also expected that the higher level of education would contribute to decision making in agricultural extension models [11]. The table also indicates that 79.50% of the respondents were farmers. This implied that farming is the major means of livelihood in the study area. The result is an indication that farmers in this area are into food crop production activities as a major source of food. This result

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agrees with the findings of Effiong [12] that food crop production is the major occupation of the people of Akpabuyo in Cross River State, Nigeria [12].

Distribution of Respondents according to level of extension model activities in the study area

The results in Table 2, show the distribution of respondents according to level of extension model activities in the study area. From the results, "training and visit" extension model was ranked first with standard deviation of 1.65. This implied that the "training and visit" model of extension has a very high level of acceptability in ensuring food crop production in Cross River State. This result agrees with Effiong and Enenyi [13] that "training and visit" extension model was used in Akwa Ibom State to achieve high level of adoption of improved rubber production technologies in that state. Contact farmers model was ranked 2nd with Standard Deviation = 1.28. This result indicated that famers adopt new technologies in food crop production through contact with fellow farmers faster than contacts with extension agents in the field. This is in tandem with Nneoyi *et al.* [14], who stated that extension contact model leverage resources, expertise, and networks to provide more effective and sustainable extension services.

In the same vein, video-based-extension model was ranked 8th with Standard Deviation = 0.63. This result implied that video-based-extension model ensures the usage of audio-visual aids for information on crop production practices, pest management and other relevant information to farmers. However, the model had low level usage in the study area. This may be due to the high economic implications of audio-visual usage. Also, Effiong and Iyamah [15] stated that audio-visual model of extension delivery has high cost implications when compared with other models of extension as phone calls, personal contacts and field demonstrations, among others.

Effectiveness of Agricultural Extension Models in Food Crop Production and Consumption in the Study Area

The results in Table 3, show mean indications of the effectiveness of agricultural extension models in food crop production in Cross River State. The results reveal that mean $\bar{x}$ = 3.58, 3.35, 3.49, 3.20 affirmed that agricultural extension models populated by extension officers are effective in food crop production in Cross River state, Nigeria. Similarly individual persons oriented model such as Mass media model with mean of $\bar{x}$ = 3.21 is also very effective in food crop production.

This result implies that agricultural extension models were effective in food crop production in the study area. On the other hand, some individual persons oriented models such as private extension model ($\bar{x} = 2.31$) and video-based model ($\bar{x} = 2.01$) were not effective in food crop production in the study area. The study

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implied that individual extension practices were not successful in food crop production in the study area. The reason for this is due to the high cost of private extension services in the study area. This is in line with the study of Aboh and Effiong [16] that private organizations charge higher cost for services rendered than government agencies.

Multifaceted extension strategies are required to address the issue of food crop production in Nigeria [17, 22, 24]. The choice of feasible models/approaches hinges on the existing government owned extension models and some individual oriented models. Agricultural production activities are time tested and need functional extension models to meet up the demand of its activities especially in crop production components. Most households derived vitamins, proteins and minerals from the consumption of food crops [18, 21, 25]. For any country to succeed in agriculture, her extension components of agriculture must be strengthened [19, 20, 23].

CONCLUSION, AND RECOMMENDATIONS FOR DEVELOPMENT

This study provided an empirical evidence of the effectiveness of agricultural extension models in food crop production and consumption in Cross River State, Nigeria. Food and nutrition derived from food crop production activities are highly essential to human growth and development. Agricultural extension models such as the training and visit models, farmers field school, direct technology transfer, training sessions on crops production practices (Agricultural Extension officers oriented models) and the mass media (individual persons oriented model) are critical in one activity or the other that enhances continuous availability, sustainability and production of food crops in the study area.

Furthermore, agricultural extension models applied in the study area increased food crop production, which affirms that extension models are positively related to food crop production. This study shows that extension model activities such as “training and visit”, contact farmers and demonstration plot models are some of the extension models necessary for increase food crop production in the study area. This, therefore, calls for improvement of extension-farmers ratio to increase extension-farmers coverage, disbursing loans to the rural poor to assist them in their food crop production activities and well-being.

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

Variables	(n = 180) Frequency	Percentage (%)	Mean
Age			
20-30	5	2.9	
31-40	24	13.4	
41-50	63	34.1	
51-60	60	33.2	
61-70	28	15.7	50.7 years
Marital Status			
Single	17	9.4	
Married	139	77.2	
Widowed	20	11.1	
Divorced	4	2.2	
Household size			
1-3	18	10.0	
4-6	80	44.4	
7-9	53	29.4	
10-12	25	13.8	
13-15	4	2.2	6.6 persons
Level of Education			
No formal education	31	17.2	
Primary education	29	16.1	
Secondary education	81	45.0	
Tertiary education	39	21.7	
Farm size			
0.5-1.0	73	40.6	
1.1-1.5	21		
1.6-2.0	36	20	
2.1-2.5	22	12.2	
2.6-3.0	28	15.6	2.0 hectares
Occupation			
Farming	143	79.5	
Civil Servant	23	12.8	
Trading	3	1.7	
Small Scale Enterprise	3	1.7	
Artisans	8	4.4	
Characteristics			

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Table 2: Distribution of Respondents according to extension model activities in the study area

S/n	Variables	VH	H	L	$\bar{x}$	SD	Ranking
1.	Training and visit model	50(20)	52(20.8)	148(59.2)	2.55	1.65	1st
2.	Farmers field school model	133(53.2)	57(22.8)	60(24)	1.70	0.82	5th
3.	Technology transfer model	110(44)	70(28)	70(28)	1.84	0.83	4th
4.	Contact Famer model	130(52)	70(28)	50(20)	1.80	1.28	2nd
5.	Small plat adoption model	137(54.8)	63(25.2)	50(20)	1.65	0.79	6th
6.	Demonstration plot model	150(60)	60(24)	40(16)	1.68	1.27	3rd
7.	Mobile based model	137(54.8)	73(29.2)	60(17)	1.61	0.74	7th
8.	ICT based model	137(54.8)	63(25.2)	50(20)	1.65	0.79	6th
9.	Private extension model	139(55.6)	61(24.4)	50(20)	1.64	0.79	6th
10.	Video-based model	164(65.6)	66(26.4)	20(8)	1.42	0.63	8th

Note: VH = very high; H = high; L = low; $\bar{x}$ = mean; SD = standard deviation; Ranking indicates levels of extension model

Table 3: Effectiveness of Agricultural Extension Models on Food Crop Production and Consumption in the Study Area

S/n	Variables	VE	E	FE	NE	Σfx	$\bar{x}$
Agricultural Extension Officers Oriented Models:							
1.	Regular visit to farmers during Training and Visit model	122(487)	33(98)	16(32)	9(9)	628	3.49
2.	Training session on crop production practices	91(364)	44(132)	35(70)	10(10)	576	3.20
3.	Highly acceptable ICT model available	23(92)	29(87)	55(110)	73(72)	362	2.01
4.	Organized group farming during FFS model	108(431)	39(116)	23(45)	10(9)	605	3.35
5.	Direct technology transfer model needed	135(540)	26(78)	10(20)	9(8)	647	3.58
6.	Farmers require small plot adoption technology model	61(243)	25(75)	61(124)	33(33)	474	2.62
7.	Demonstration model highly utilized	56(223)	51(154)	38(75)	35(36)	508	2.87
8.	Mobil based model aid improvement of crop production and consumption	48(191)	41(123)	63(126)	28(28)	469	2.60
Individual Persons Oriented Models:							
9.	Crop production requires private extension model	37(147)	36(109)	51(101)	56(57)	414	2.31
10.	Mass media model	91(364)	44(131)	35(71)	10(10)	575	3.211
11.	Video-based extension model is suitable	23(91)	28(88)	55(109)	75(74)	362	2.01

Decision rule $\bar{x}$ 2.5 and above indicates effectiveness, $\bar{x}$ = $\leq$ 2.5 indicates not effective
Note: VE =very effective; E = effective; FE = Fairy effective; NE = Not effectives $\bar{x}$ = Mean

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