ASSESSMENT OF FOOD CROP FARMERS' PARTICIPATION AND PERFORMANCE IN WEST AFRICAN AGRICULTURAL PRODUCTIVITY PROGRAMME (WAAPP) IN ABIA, NIGERIA

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Abstract
This study was carried out in 2016 to assess food crop farmers' performance on farmers' participating in West African Agricultural Productivity Programme (WAAPP) in Abia State, Nigeria. Multi-stage random sampling technique was used in the study. The three Agricultural zones in the state were involved. Two blocks which have WAAPP sponsored projects in their locations were purposively selected from each zone. Based on same reason, two circles were purposively selected from the blocks making them twelve circles. Finally, ten farmers who participated in WAAPP activities on yam and cassava farming were randomly selected, in all 120 respondents made up the sample size. List of farmers who participated in WAAPP collected from N.R.C.R.I WAAPP Coordinating office, Umudike and Agricultural Innovation Platform (AIP), Umudike served as the study population. A structured questionnaire was used to elicit information from the farmers. Data were analyzed using descriptive and inferential statistics. The result revealed that 65.83% of the respondents were male while 34.17% were female. It showed that the mean age of the respondents was 50.4 years. This result revealed that majority of the respondents are adults and in their active age. The result also showed that 47.50% of the respondents had farm sizes of less than 1 hectare and the mean of farm size was 0.9ha. The result showed high adoption level with grand mean score of 2.42. The major constraint to food crop farmers' participation in WAAPP farming activities was paucity of funds (65%), Untimely supplies of input (60.00%), ineffective mobilization of farmers (53.33%), Lack of farm land (20.0%), Poor leadership or contact farmer (13.3%), Poor/inadequate enlightenment (12.01%). The result of multiple regression analysis showed -2.157, -3.432, 12.096, 10.389, 2.109, 3.266 and 2.785, indicating significant relationship between adoption and socioeconomics characteristics of the farmers. The study therefore concluded that food crop farmers' in the study area participated actively in activities of WAAPP on food crop farming and the programme achieved her set objective. Therefore, it was recommended that more efforts should be made by WAAPP coordinating offices toward supplies of inputs on time, because high and timely supply of inputs will encourage cassava and yam farming.

Key words: Farmers, Participation, Adoption and WAAPP

Introduction

West African Agricultural Productivity Programme (WAAPP) is a World Bank assisted programme for members of Economic Community of the West Africa States (ECOWAS). The programme was designed to make agriculture more productive while promoting regional integration along the value chain of its targeted commodities. WAAPP-Nigeria became effective in 12th January, 2012 after approval of the World Bank. It is a project for all West African nations of which thirteen of the fifteen countries are currently participating in the programme. This project aims at helping to provide enabling conditions for Nigeria to cooperate with countries in the West African sub-region in technology generation and dissemination as well providing access to improved agricultural technology generation and dissemination in the country (WAAPP, 2012). It is a development programme as well as agricultural oriented which is aimed at raising the living standard of rural people. According to Olujide (2006), the development programmes were established with the aim of raising the living standard of the rural people as well as boosting their share of Gross Domestic

Product (GDP). Farmers' participation in rural community development programme such as in WAAPP activities in cassava and yam farming will help to improve food crop production in the rural communities and reduce their poverty level. Information on farmers' performance in participating in West African Agricultural Productivity Programme (WAAPP) in the study area concerning food crop farming is still lacking. It becomes imperative to assess farmers' performance in the programme's activities in Abia State. The major objective of this study was to assess food crop farmers' performance in West African Agricultural Productivity Programme in Abia State, and specifically, to: describe the socio- economic characteristics of the food crop farmers in the study area; ascertain the level of farmers' adoption of improved farming technologies disseminated by the programme and ascertain constraints militating against farmers' participation in WAAPP. The hypothesis states that there is no significant relationship between food crop farmers' adoption of improved farming technologies disseminated by WAAPP and their socio-economic characteristics.

Methodology

A multi stage stratified sampling technique was used to elicit data for the study. In the first stage, the three agricultural zones of the state namely Aba zone, Umuahia zone and Ohafia zone were involved. Two blocks from each of the agricultural zones were purposively selected. They are Umuahia North and Umuahia South for Umuahia agricultural zone, Ohafia and Bende for Ohafia zone and Obingwa and Isiala ngwa North for Aba zone, giving a total of six blocks. These six blocks were selected because they have WAAPP sponsored projects in their locations. Furthermore, two circles from each of the six blocks were purposively selected making it twelve circles that were selected for the study. Finally, ten (10) farmers who participated in WAAPP activities on yam and cassava farming were randomly selected from each of the selected circles. A well-structured set of questionnaire were used to interview the farmers, in all 120 respondents made up the sample size for the survey. List of farmers who participated in WAAPP collected from NRCRI Extension Services Programme, Umudike and Agricultural Innovation Platform (AIP) in Umuahia served as the sample frame. Data were analyzed using descriptive and inferential statistics. Descriptive statistics include frequency, percentages, and mean while inferential statistics involved the use of multiple regression model. The model is implicitly stated as;

$Y= (X_1, X_2, X_3, X_4, X_5, X_6 X_7 X_8 +u)$……. 1

Where

Y = Level of Adoption

X_1 = Sex (male = 1, female = 0)

X_2 = Age (years)

X_3 = Educational status (number of years a farmer spent in school)

X_4 = Marital status (married = 1, not married = 0)

X_5 = Annual income (naira)

X_6 = Household size (numbers)

X_7 = Main Occupation (Farming = 1, non-farming = 0)

X_8 = Membership of community based organization (membership = 1, otherwise =0)

U = error term

Results and Discussion

Socio-economic Characteristics of the Farmers

The result revealed that 65.83% of the respondents were male while 34.17% were female. It shows that more men participated than women in WAAPP food crop farming activities. A large proportion of the respondents (78.33%) were married. This may be attributed to the fact that married people who have families have more responsibilities than the unmarried ones and therefore need more benefits from such rural development project. Farming is a necessary condition for families to lift their households out of poverty and ensure hunger free situation at homes (Verter and Becvarova, 2014).

Table 1: Distribution of respondents' socio- economic characteristics

Socio-economic characteristics	Operational	Frequency	Percentages	mean
Sex				
	Male	79	65.83	
	Female	41	34.17	
Marital status				
	Single	26	21.67	
	Married	85	70.83	
	Widowed	9	7.50	
Age				
	26 – 35yrs	8	6.67	
	36 – 45yrs	34	28.33	
	46 – 55yrs	40	33.33	50.4 years
	56 – 65yrs	27	22.50	
	66 and above	11	9.17	
Educational attainment				
	Non-formal	1	0.83	
	Primary	29	24.17	
	Secondary	61	50.83	
	Tertiary	29	24.17	
Annual income				
	100,000 – 300,000	10	8.33	
	301,000 – 500,000	51	42.50	₦510,000
	501,000 – 700,000	47	39.17	
	701,000 – 900,000	9	7.50	
	901,000 – 1,100,000	1	0.83	
	1,101,000 and above	2	1.67	
Household size				
	1 -5	18	15.00	
	6 – 10	61	50.84	
	11 – 15	25	20.83	9 persons
	16 - 20	16	13.33	
Farm size				
	0.1-0.9ha	57	47.50	
	1.0-1.9 ha	34	28.33	
	2.0- 2.9ha	23	19.17	0.9 ha
	3.0- 3.9ha	6	5.00	
Farming experience				
	1 -5 yrs	8	6.67	
	6 – 10yrs	16	13.33	
	11-15yrs	40	33.33	
	16 – 20yrs	25	20.83	15.6 years
	21 – 25yrs	22	18.33	
	Above 25yrs	9	7.50	
Membership of community base organization	Yes	118	98.33	
	No	2	1.67	

Source: Field Survey, 2016

The result also showed that 28.33% of the respondents were between the ages of 36 and 45years; 33.33% of the respondents were between the ages of 46 and 55years while 22.50% of the respondents are between the ages of 56 and 65years. The mean age was 50.4 years. The implication of this result is that majority of the respondents are adults and in their active age. It could also be deduced that when given the adequate levels of farming resources, the farmers have the potential to maximize their output. According to Akudugu *et al*. (2012), age has been described as an important factor that influences the probabilities of adoption of new technologies. Table 4.1 reveals that majority of the respondents (42.50%) earns between ₦301, 000 – ₦500,000 annually while 39.17% of the respondents earned between and ₦501, 000 – ₦700,000. Only 10.00% of the respondents

earned between ₦701, 000 – ₦1,300,000 annually. The mean annual income was ₦510,000. The value of dollar during this study was fixed at an average of ₦400.00 per dollar. The implication of this finding was that majority of the respondents earned lower that $I per day which is the World Bank rate for poverty line, meaning that they are poor farmers. This agrees with Ekong (2003) who stated that at the end of 2002, it was estimated that over 70% of Nigerians were still living below the international poverty line that is equivalent of one dollar per day.

The result from Table 1 also showed that 47.50% of the respondents had farm sizes of less than 1 hectare while 28.33% of the respondents had farm size of 1hactare. The mean farm size owned was 0.9ha. This indicated that the farmers are small holder farmers. According to Okoye *et al.* (2004), more than two third of the rural population live on small farms less than two hectares, characterized by low technology, the use of family labour and subsistence orientation. The table shows that 33.33% of the respondents had farming experience of 11-15years while 20.83% of the respondents had farming experience of 16 - 20years. Mean of farming experience was 15.6 years. This implies that the more experience one had in farming the more the person will likely get involved and more committed in agricultural oriented project. This agrees with Mazza *et al.* (2013) that long farming experience builds confidence in the farmers. It was revealed that most of the respondents (50.84%) had between 6 and 10 household members; followed by 20.83% of the respondents constituting 11-15 household members. The mean house hold size was 9 persons. The implication is that large households' size will involve more hands in farming activities. Therefore household size is a necessity for the size of the farm and increase in yam and cassava farming. This result agrees with the finding by Okonkwo (2006) who reported that large household size increases the quantity of food produced in the family and could make the households heads engage in different activities to earn more money. It also in agreement with Nwobiala, *et al*. (2009), that larger house hold size is a cheaper means of providing farm labour and reducing labour cost.

Level of Farmers' Adoption of Improved Farming Technologies Disseminated by WAAPP

Table 2 shows that most of the technologies disseminated to the WAAPP participants were adopted in varying degrees.

Table 2: Mean Rating of Farmers' Level of Adoption of Food Crop Farming Technologies

Technologies	Never adopt	Adopt and stopped	Adopt and still using	Total	Mean
Improved cassava varieties	10(10)	37(74)	73(219)	303	2.56**
Cassava stem cutting (6 and 4 nodes)	13(13)	27(54)	80(240)	307	2.31**
Appropriate spacing for Root and tuber production	31(31)	13(26)	76(228)	285	2.38**
Cassava planting pattern (Slanting)	13(13)	23(46)	84(252)	311	2.59**
Improved yam varieties	36(36)	15(30)	69(207)	273	2.28*
Yam minisett techniques	38(38)	47(94)	35(105)	237	1.97
Yam minisett planting time	36(36)	11(22)	73(219)	277	2.31**
Yam minisett planting space	40(40)	49(98)	31(93)	231	1.92
Improved yam staking methods	18(18)	5(10)	97(291)	319	2.66**
Fertilizer application	13(13)	34(68)	73(219)	300	2.50**
Weeding (1^{st} and 2^{nd})	1(01)	16(32)	103(309)	342	2.85**
Proper harvest time	18(18)	2(4)	100(300)	322	2.68**
Grand Mean					**2.42****

**** High level of adoption. * Moderate level of adoption. Bench mark mean score 2.00**

Out of twelve (12) technologies listed, ten (10) technologies were adopted namely improved cassava varieties (2.56), cassava stem cutting (2.31), appropriate spacing for cassava root and tuber (2.38), cassava planting pattern (2.59), improved yam varieties (2.28), yam minisett planting time (2.31), improved yam staking (2.66), 1^{st} and 2^{nd} weeding (2.85), fertilizer application (2.50) and proper harvest time (2.68). Grand mean score was 2.42. The result showed high adoption level and

it implies that the participants adopted the improved food crop farming technologies disseminated to them through WAAPP sponsored programme. Therefore, the programme achieved her objective. It is expected that high adoption would bring about improvement in crop yield, thereby meeting the objective of the programme. This agrees with Nwosu (2010) who stated that acceptance of new technologies by farmers is a necessary precondition for agricultural and rural development.

Relationship between Level of Adoption of Farming Technologies Disseminated and the Socio-Economic Characteristics of the Respondents

Among the four functional forms, double log was selected as the lead equation based on the number of significant variables and conformity to *a priori* expectation.

Table 3: Estimates of Relationship between Participants' Level of Adoption of WAAPP Technologies and Socio-Economic Characteristics

Variable	Linear	Exponential	Semi-log	+Double - log
Constant	-.773	-4.219	-.651	-11.908
	(-2.575)*	(-6.355)***	(-1.131)	(18.313)***
Gender	-.059	-.097	-.573	-.058
	(-2.065)*	(-2.061)*	(-2.303)*	(-2.157)*
Marital status	.466	.598	-.250	.534
	(9.667)***	(7.541)***	(-.729)	(12.096)***
Age	-.134	-.157	-.086	-.107
	(-4.021)***	(-2.851) **	(-.357)	(-3.452)**
Education	.569	.291	1.047	.492
	(11.269)***	(3.503)**	(3.296)*	(10.389)***
Income	.047	.181	-.378	.062
	(1.609)	(3.729)***	(-1.877)*	(2.109)*
Household size	-.013	.013	.513	-.033
	(-.407)	(.258)	(1.958)	(-1.186)
Major occupation	.049	.002	-.223	.086
	(1.645)	(.046)	(-1.115)	(3.266)**
Membership of community based organization	.041	.165	.072	.070
	(1.478)	(3.651)***	(.413)	(2.785)**
R^2	.922	.790	.845	.936
F-statistics	129.275***	40.912***	8.258***	159.462***

Figure in parenthesis = t-ratios; *** = significant at 1% level, ** = 5% and * = at 10% level, + = Lead Equation.

The R^2 value (0.936) which implied that about 93.6% of the variation in level adoption of WAAPP technologies by the respondents was explained by independent variables. F ratio was also highly significant at 1%, indicating goodness of fit. Variables such as sex, marital status, age, education, income, main occupation, and membership of community-based organization were found to be significantly related to adoption of technologies from WAAPP. Sex was significant at 10% level but negatively related to adoption of WAAPP technologies on food crop farming. This implied that the more males adopted the WAAPP technologies in the study area. This agrees with the findings of Nwakor, *et al*. (2016) and Anozie *et al.* (2015), who reported that women in sub-Saharan Africa perform over 60% of farming activities and adoption of improved technologies. Marital status was highly significant and positively related to adoption at 1% level. This implied that farmers who are married adopted the technologies in the programme more than the unmarried ones. Married farmers are always eager to adopt agricultural technologies than unmarried ones. This conforms to the *a priori* expectation and agrees with Nwokocha (2012), that married people who have families have more responsibilities than the unmarried ones and therefore need more benefits from such rural development project.

Age was revealed to be negative and significantly related to adoption at 5% level. The result meant that the older the farmer, the lesser the adoption of improved farming technologies. The finding is in conformity with the *a priori* expectation and agrees with Hartley (2003), who says that respondents within productive age are likely to adopt innovations better because they are still active and

dynamic than the ones who are of age. Also Ironkwe and Ewuziem (2010) stated that age had positive effect on the use of technologies.

Educational attainment was found to be significant at 1% level and is positively related to adoption of WAAPP technologies. This implied that increase in the level of education will lead to corresponding increase in adoption of farming technologies. It means that as farmers acquire more formal education, the level of farming technologies adoption would likely increase. This finding agrees to *a priori* expectation and consistent with the finding of Odoemelam, *et al.* (2016) who opined that farmers can only utilize technologies when they are aware of that technology. It also agrees with finding of Ume, *et al.* (2013), who stated that education helped to facilitate adoption as it makes one to be more objective in evaluating innovation, which will influence his or her production. The result also revealed that income was significant and positively related to adoption at 10% level; implying that as the farmer's income increased, the adoption level also increased. This agrees with *a priori* expectation and finding of Ekenta, *et al.* (2015) who reported that a unit increase in income would cause a unit increase in adoption of the technologies.

Main occupation was revealed to be significant at 5% level and positively related to adoption of food crop farming technologies of WAAPP. This implied that those that have farming as their main occupation adopted the technologies more than those who have their main occupation as trading, artisans and civil servants. The finding conforms to *a priori* expectation and shows that full time farming has positive influence in adoption of farming technology. This agrees with finding of Nwakor, *et al.* (2010) that full time farmers are expected to have positive influence on adoption. Membership of community based-organization was found significant at 5% level and positively related to adoption. It implied that being membership to farmers association or community association will likely adopt technologies more. This conforms to *a prior* expectation and agrees with Odoemelam, *et al.* (2016), who stated that farmers who are not members of associations are expected to have lower probabilities of adoption and low level of adoption of conservation technologies. Hence, since the variables were significant at 1%, 5% and 10% levels. It therefore implied that the null hypothesis which stated that there is no significant relationship between participants' level of adoption of improved technologies in WAAPP and their socio-economic characteristics was rejected. Thus, the study concluded that there was significant relationship between participants' level of adoption of improved technologies in WAAPP and their socio-economic characteristics.

Constraints Militating against Food Crop Farmers' Participation in WAAPP

The results in Table 4 shows that the major constraint to food crop farmers' participation in WAAPP farming activities which ranked first, was paucity of funds (65%) that will enable them prepare their farm land and pay for labour.

Table 4: Constraints Militating Against Farmers' Participation in WAAPP

Option	*Frequency	Percentages	Rank
Paucity of fund	78	65.00	1st
Untimely supplies of input	72	60.00	2nd
Ineffective mobilization of the farmers	64	53.33	3rd
Lack of farm land	24	20.00	4th
Poor leadership (contact farmer)	12	13.33	5th
Poor/ inadequate enlightenment	13	12.01	6th
Type of occupation	16	10.00	7th

Source: Field Survey, 2016.*Multiple Responses

This agrees with Anyaegbunam, *et al.* (2011), who stated that credit facilities and accessibility are crucial for food crop farming because most farmers are subsistence based and poor resource in

terms of capital outlay. Untimely supplies of input came second (60.00%) while the third constraint to food crop farmers' participation in the WAAPP sponsored programme was ineffective mobilization of farmers (53.33%). Lack of farm land (20.0%), ranked fourth among the constraints to farmers' participation in the programme. Most of the farmers were limited to small scale fragmented farm land owned by their parents or community. This agrees with Adegboye, *et al.* (2010), who observed that it is even more difficult for farmers to get a piece of land except through inheritance. Similarly, Okoye *et al.*, (2004) in a study found that more than two third of the rural population live on small farms less than two hectares, characterized by low technology, the use of family labour and subsistence orientation. Poor leadership or contact farmer (13.3%), ranked fifth among the constraints to farmers' participation in WAAPP farming activities. This conforms to the finding of Adegboye, *et al.*, (2010), who reported that the weakness of extension system is primarily due to chronic under investment within each level as well as poor coordination between the levels. Poor/inadequate enlightenment (12.01%), ranked sixth. The implication of these constraints was that they reduced the rate at which food crop farmers in the study area participated in the programme.

Conclusion

The study revealed that farmers' performance was high and the programme achieved her set objective in the study area because of high level of adoption of improved farming technologies disseminated through the programme. Therefore, the study concluded that WAAPP in Abia state was successful in achieving its set objective.

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