

# The Effectiveness Of National Root Crop Research Institute (Nrcri) Selected Technologies In Poverty Alleviation Among Rural Households In Abia State, Nigeria

OKRINGBO, J. I., ODUEHIE, T. C., IBENEME, G. C.

**ABSTRACT:** This study evaluated the effectiveness of National Root Crop Research Institute (NRCRI) selected technologies in poverty alleviation among rural households in Abia state, Nigeria. Purposive and multi-stage sampling techniques were used in selection of Umuahia agricultural zone which is the host zone to NRCRI and sixty (60) rural farmers from the study area were selected. Data were collected using structured questionnaire and analyzed with descriptive statistics, poverty gap analysis, and one sample Z-test and ANOVA. The result shows that farmers identified; yam of mini sett ( $\bar{x}=2.07$ ) as an improved yam technology; provision of improved technology of cocoyam ( $\bar{x}=4.23$ ), provision of improved technology of sweet potatoes ( $\bar{x}=6.52$ ), advisory services on other improved technologies ( $\bar{x}=8.32$ ), agro-processing improvement services ( $\bar{x}=10.77$ ) and advisory service on stem cutting and planting pattern ( $\bar{x}=0.62$ ) were the various technologies provided by NRCRI. NRCRI technologies were effective in reducing the cost of purchasing root and tuber crops ( $\bar{x}=3.2$ ); producing disease resistance, early maturing and large yield root and tuber crops ( $\bar{x}=3.4$ ) were effective means to alleviate poverty by NRCRI. The study further, shows that improved cassava varieties TMS ( $\bar{x}=2.7$ ) and NR ( $\bar{x}=2.6$ ) were adopted by farmers and improved varieties yam; *Dioscorea rotundata* ( $\bar{x}=3.0$ ) was adopted. The results of the one sample z-test showed that there were significant difference between the mean scores response of the respondents on the various questions raised on the NRCRI technologies effectiveness in alleviating poverty were significant at 1% respectively. The result showed that the mean score on the level of adoption of improved variety TMS in the study were  $1.00 \pm 0.00^b$  and  $1.30 \pm 0.070^b$  was at the same level of adoption while, mean scores NR were  $1.15 \pm 0.154^a$ ,  $2.11 \pm 0.048^a$  and  $3.00 \pm 0.000^a$  respectively and the Duncan multiple range test used as mean separation technique show that there is a significant difference (F-ratio 3.295) among the level of adoption. The various technologies developed and disseminated should be sustained and more farmers should encouraged to adopt the disseminated technologies, since the poverty incidence was high and Government should construct roads to link farms in other to enable farmers transport their produce.

**Keywords:** Effectiveness, Technology, Poverty, Alleviation and Rural Household

## INTRODUCTION

Poverty in Nigeria is pervasive although the country is rich in human and materials resource that should into better living standards [1]. Widespread poverty with daily consumption expenditures of below the USD 1 per day, illiteracy, disease and human misery still remain conspicuous features of the rural areas [2]. Despite the various efforts of by research institutes, federal, state and local government to reduce the incidence of poverty through different poverty alleviation programmes. According to [3], all the poverty alleviation programme initiatives in Nigeria since independence have yielded very little fruit. He claimed that the programme was mostly not designed to alleviate poverty because they lacked cleared defined policy framework with proper guideline for poverty alleviated. In order to raise the standard of living of the people and in still in the poor people some sense of belonging. UNDP Human Index Report presents a bleak profile of poverty situation in Nigeria with respect to two principal categories of poverty-human and income. Nigeria is ranked 15<sup>th</sup> out 186 amongst countries with low development index life expectancy place at 52 years old, while adult literacy was 61.3% and 68% of Nigerians are stated to be having below \$1.25 daily [4] [5] argued that despite the various past rural programmes in Nigeria, poverty, diseases, ignorance, unemployment, declining gross national product and per capita income, inflation, hunger malnutrition, crimes and other vices have assumed dangerous levels. Admittedly, poverty and rural underdevelopment in Nigeria may be largely attributed to

government's bureaucratic and top-down approach in her rural development and poverty reduction programmes which does not make for effective participation of the people in the programmes. The rural people are marginalized, alienated, discriminated against and rarely involved in the decision-making process, especially in those development programmes that affect their lives. Root and tuber crops are the staple food and main source of calories for an estimated 700 million poor in Africa, Asia and Latin America [6]. The most widely produced and consumed is cassava, but other important crops in this group include yam, sweet potato, and ginger. Root and tuber crops are very important crops because they form the bulk of the staple food consumed in Nigeria. Some find their importance in confectionary and medicinal uses. It is one record that the post harvest losses recorded in root and tuber crops in high, not minding the high local consumption of root and tuber crops has not translated to enhanced revenue to the farmers because farmers sell at give away prices for fear of total loss to post harvest deterioration [7].

### The specific objectives were to;

- i. identify the various NRCRI technologies in the study area
- ii. determine the poverty level of respondents in the study area
- iii. ascertain the effectiveness of NRCRI technologies on poverty alleviation in the study area
- iv. determine the level of adoption of the NRCRI technologies

### Hypotheses

**Ho<sub>1</sub>:** There is no significant difference in the farmers rating NRCRI technologies effectiveness in poverty in the study area

**Ho<sub>2</sub>:** Adoption of NRCRI technologies has no significant effect on the livelihood status individual households

### MATERIALS AND METHODS

The study was conducted in Abia State, Nigeria. The State is one of the 36 states of the Federal Republic of Nigeria which was created on 27th August, 1991, and is located in the south-east geo-political zone of Nigeria. It lies between longitude 7° 23' and 8° 02'E and Latitude 5° 47' and 6° 12N. According to the 1991 provisional census figures, the State has a population of 2,297,278 people comprising 1,808,357 males and 1,189,621 females. It covers a land area of 776,720 square kilometers. Abia State shares boundaries with Imo, Ebonyi, Enugu, Rivers and Akwa Ibom states. Current census statistics puts the State at a population of 2,833,000, with an annual growth rate of 2.83% and a population density of about 580 persons/ km<sup>2</sup> [8]. Multistage random sampling technique was used in selection of three local government and six communities and ten rural households from the selected communities which us a sample size of 60 rural households. Objective 1, 3 and 4 were analyzed with descriptive statistics, while 2 was analyzed poverty gap analysis.

#### Model Specifications

- Poverty index measure, mean and percentages were employed. The poverty line for farming households was derived from Mean per Capita Household Expenditure (MCHE). The Per Capita Household Expenditure (PCH) households were computed by dividing each household's total monthly expenditure by household size as used by the [9]. It is stated as follows:

Per Capita Household Expenditure =  $\frac{\text{Total household monthly expenditure}}{\text{Household size}} \dots\dots\dots(1.0)$

Household size

The Mean Per Capita Expenditure (MPCE) for all male and female respondents was determined as the ratio of total per capita expenditure for all male and female household to total number of household as follows:

Mean Per Capita Expenditure =  $\frac{\text{Total Per Capita Expenditure for all households}}{\text{Total Number of Households}} \dots\dots\dots(2.0)$

Three mutually exclusive classes obtained from the MPCE are: A core poverty line equivalent to one third (1/3) of MPCE. The moderate poverty line equivalent to two third (2/3) of the MPCE. The non-poor (those that are above the poverty line). The poverty incidence was measured using

$P_0 = \frac{Q}{H} = \frac{H}{n}$   
 ..... (3.0)

This is simply proportion of the poor to the total population (i.e., head ratio).

Where:

P<sub>0</sub> = Poverty index

H = head count

N = Total population

q = Number of poor people (below poverty line).

Poverty gap model was used in accordance with [10].

Poverty gap (I)

$I = [(z-y)/z]$

Where,

I = poverty gap

Z = poverty line – estimated using the mean households expenditure

Y = average income of the poor households

- Hypotheses two was tested using one sample Z-test technique. The mean scores of the responses of the farmers rating NRCRI technologies effectiveness in alleviating poverty study in the area was compared to a decision mean score of 2.5

- ANOVA was used to test this hypothesis. The choice of ANOVA in this study was justified by the comparison of more than two arable crops.

The F-statistic was used to determine the significance of the model. The F- statistic is given as

F- Statistic = MSS/MSE

Where,

MSS = Mean sum of squares for i<sup>th</sup> NRCRI technologies

MSE = Mean square error.

**Decision:** if  $F_{cal} > F_{tab}$  at (P ≤ 0.05) we reject the null hypothesis and accept the alternative hypothesis and vice versa. The Duncan Multiple Range Test (DMRT) was used as the separation technique for the mean in this study.

### RESULT AND DISCUSSION

The various NRCRI extension technologies are identified in Table 1. The result revealed that; provision of improved technology yam of mini sett ( $\bar{x}=2.07$ ); provision of improved technology of cocoyam ( $\bar{x}=4.23$ ), provision of improved technology of sweet potatoes ( $\bar{x}=6.52$ ), advisory services on improved technologies ( $\bar{x}=8.32$ ), agro-processing improvement service ( $\bar{x}=10.77$ ) and advisory service on stem cutting and planting pattern ( $\bar{x}=0.62$ ). The implication of this finding is that the NRCRI technologies were identified to be technologies developed by the research institute to alleviate poverty in the study area. It refers to the research institute for improved technology, in order to effectively deliver services to the farmers. This is line with [11] who noted that the problem that emanate from agriculture at grass root levels are transfer to the scientist by the extension personnel and the solution in form of improved technology disseminated to the farmers for implementation.

**Table 1: Distribution according to various NRCRI technologies in the study area**

Variables	Mean	STD
Provision of improved technology yam of mini sett	2.07	0.252
Provision of improved technology of cocoyam	4.23	0.427
Provision of improved technology of sweet potatoes	6.52	0.813
Advisory services on improved technologies	8.32	0.469
Agro-processing improvement service	10.77	0.427
Advisory service on stem cutting and planting pattern	0.62	0.490

Source: field survey data, 2017

The poverty level of farmers in Abia state is shown in Table 2. The result shows the poverty line (mean monthly household expenditure) of farmers was ₦146,670.96 per annum, with average annual income of ₦270,000.00. The result also indicated that, the poverty incidence which can also be regarded as the head count ratio [10] was 0.35% farmers in Abia. This implies that 55% farmers are poor because their annual income fell below the poverty line.

The poverty gap also known as the income shortfall allows the assessment of the degree of poverty among farmers, showed that the poverty of farmers was 37.06%, meaning that farmers within Abia state require ₦36,240.68 poverty line to get out poverty. [12] obtained a similar result on the effect of community-based programme on the poverty profiles of farmers in Cross River state, Nigeria.

**Table 2: Poverty gap of farmers in Abia state**

Indicators (per annum)	Estimate
Mean Household Expenditure (₦)	146,670.96
Average income (₦)	270,000.00
Poverty line (₦)	97,780.64
Poverty incidence (%)	35.00
Poverty gap (%)	37.06

Source: Field survey, 2017

The result in Table 3 shows that the respondents had mean rating of > 2.00 in all the outlined items bordering on the effectiveness of NRCRI technologies on poverty alleviation. The respondents had a mean rating of 2.9 in their response to the question how effective is growing your root and tuber crops. The farmers mean score of 2.9 was above the bench mark score of (2.0). The response of NRCRI agents concerning root and tuber crops from research institute ( $\bar{x}$

=2.8), how effective is NRCRI programme in reducing the cost of purchasing root and tuber crop ( $\bar{x}$ =3.2), how effective is the institute in disseminating their research finding to the farmers in the communities ( $\bar{x}$ =3.4) and how effective is NRCRI in terms of producing disease resistance, early maturing and large yield root and tuber crops ( $\bar{x}$ =3.4).

**Table 4: Distribution according to the effectiveness of NRCRI technologies on poverty alleviation in the study area**

Indicators	Scores (n =60)				Total Score $\sum F\bar{X}$	Mean Score $\bar{X}$	Remark
	VE 4	E 3	PE 2	INE 1			
How effective is growing your root and tuber crops	20	20	16	4	176	2.9	Effective
How effective is the response of NRCRI agents concerning root and tuber crops from research institute	21	17	13	9	170	2.8	Effective
How effective is NRCRI technologies in reducing the cost of purchasing root and tuber crop.	27	21	6	6	189	3.2	Effective
How effective is the institute in disseminating their research finding to the farmers in the communities	40	9	8	3	206	3.4	Effective
How effective is NRCRI in terms of producing disease resistance, early maturing and large yield root and tuber crops	28	21	11	6	203	3.4	Effective
<b>Overall mean score</b>						<b>3.14</b>	
<b>Bench mark mean score (Decision cut point)</b>						<b>2.5</b>	

Source: field survey data, 2017. Note VE= very effective; E= effective, PE= partly effective, INE= Ineffective

The result in Table 4 shows that the respondents had mean rating of > 2.00 in all the outlined items bordering on the effectiveness of NRCRI technologies on poverty alleviation. The respondents had a mean rating of 2.9 in their response to the question how effective is growing your root and tuber crops. The farmers mean score of 2.9 was above the bench

mark score of (2.0). The response of NRCRI agents concerning root and tuber crops from research institute ( $\bar{x}$  =2.8), how effective is NRCRI technologies in reducing the cost of purchasing root and tuber crop ( $\bar{x}$ =3.2), how effective is the institute in disseminating their research

finding to the farmers in the communities ( $\bar{x}=3.4$ ) and how effective is NRCRI in terms of producing disease

resistance, early maturing and large yield root and tuber crops ( $\bar{x}=3.4$ ).

**Table 5:** Distribution according to the level of adoption of the NRCRI technologies

S/N	Technologies	Scores (n =60)			Total Score $\sum F\bar{x}$	Mean Score $\bar{X}$ (Varieties )	Mean Score $\bar{X}$ (Technology)
		AA 3	AD 2	NA 1			
1	<b>Improved cassava varieties</b>						
	TMS	44	16		164	2.70	2.65
	NR	38	22		158	2.60	
2	<b>Improved cocoyam varieties</b>						
	NCE 001	3	44	13	110	1.80	1.90
	NCE 002	9	39	12	117	2.00	
3	<b>Improved sweet potatoes</b>						
	Umu Spo 1	37	13	10	147	2.50	2.50
	Umu Spo 2	37	13	10	147	2.50	
4.	<b>Improved Yam varieties</b>						
	White(Dioscorea rotundata)	60			180	3.00	2.85
	Yellow(Dioscorea cayenensis)	43	17		163	2.70	
<b>Overall mean score</b>							<b>2.48</b>
<b>Bench mark mean score (Decision cut point)</b>							<b>2.00</b>

Source: field survey, 2017. Note: AA= always adopted; AD = adopted and discontinued and NA = never adopted

The level of adoption of NRCRI technologies by respondents presented on Table 5. The result revealed that improved cassava varieties TMS ( $\bar{x}=2.7$ ) and NR ( $\bar{x}=2.6$ ) were adopted by farmers because the mean score was higher than the bench means score. The result further revealed that improved cocoyam varieties NCE 001 ( $\bar{x}=1.8$ ), while, NCE 002 ( $\bar{x}=2.0$ ) adopted. This implies that rural farmers were at the adoption stage. This is line with [13] who noted that inadequate and insufficient exposure of the rural farmers to production technologies disseminated by extension agent. Table 5 further revealed that improved sweet potatoes varieties; Umu spo1 ( $\bar{x}=2.5$ ) and Umu spo 2 ( $\bar{x}=2.5$ ) were adopted because the both means scores were above the bench mark of 2.0. This implies that these

technologies developed by NRCRI have alleviated poverty to a reasonable level because farmers also sell some these farmer produce after removing their immediate household requirement. The result presented in Table 5. Still revealed that as part of improved varieties yam; dioscorea rotundata ( $\bar{x}=3.0$ ) was adopted and farmers claimed that among all the root and tuber technologies developed by NRCRI yam is the chief crop. This is in line with [14] [15]; [16] and [17]. Yam plays significant roles in the social-cultural activities in Sub-Saharan Africa such as Nigeria and Ghana. For instance, some households used it during marriage and fertility ceremonies. More so, the festival takes place yearly to celebrate its harvest, and other social ceremonies.

**Table 6:** Result of Paired Z-test for the difference in the farmers rating NRCRI technologies effectiveness in alleviating poverty in Abia state

S/N	Items NRCRI Technologies	One sample z- test (z-test value 2.5)					
		Mean	Std Deviation	Std Error Mean	Df	Z-cal	Z-tab
1	How effective is growing your root and tuber crops	2.90	.050	.02887	59	13.856***	1.98
2	How effective is the response of NRCRI agents concerning root and tuber crops from research institute	2.80	.030	.01732	59	17.321***	1.98
3	How effective is NRCRI technologies in reducing the cost of purchasing root and tuber crop.	3.19	.017	.01000	59	69.000***	1.98
4	How effective is the institute in disseminating their research finding to the farmers in the communities	3.40	.035	.02028	59	44.552***	1.98
5	How effective is NRCRI in terms of producing	3.40	.05	.02887	59	31.177***	1.98

disease resistance, early maturing and large  
yield root and tuber crops

Source: field survey data, 2017. T-tabulated value (2-tails) \*\*\* is Significant at 1% level of probability  $P \leq 0.05$ .

The result of a difference in the effectiveness of growing your root and tubers crops; the response of NRCRI agents concerning root and tuber crops from research institute, NRCRI technologies in reducing the cost of purchasing root and tuber crop, how effective is the institute in disseminating their research finding to the farmers in the communities and NRCRI in terms of producing disease resistance, early maturing and large yield root and tuber crops. The effective growing root and tuber crops in Abia state shows that the mean of farmer was 2.90 while the mean standard deviation was .050. The result indicated a  $z_{cal}$  of 13.856, which was greater than the  $z_{tab}$  of 1.98 and was statistically significant at 5% level of probability. The result shows that the NRCRI was effective in growing root and tuber crop which alleviated the poverty status of farmers in Abia state. The effective response of NRCRI extension agents concerning root and tuber crops from the research institute. Table 6 showed that the mean 2.80 while the mean standard deviation was .030. The result indicated a  $z_{cal}$  17.321 which was greater than the  $z_{tab}$  of 1.98 and was statistically significant at 5% level of probability. The result implies that NRCRI extension agent were effective in responding to rural farmers problems which in other hand will improve their standard of living. How effective is NRCRI technologies in reducing the cost of purchasing root and tuber crop. The Table showed that the mean 3.19 while the mean standard deviation was .017. The result indicated a  $z_{cal}$  69.000 which was greater than the  $z_{tab}$  of 1.98 and was statistically significant at 5% level of probability. This implies that NRCRI technologies cost were reduced in other enable farmers to purchase developed improved varieties at minimal price. How effective is the institute in disseminating their research finding to the farmers in the communities. The result showed that the mean 3.40 while the mean standard deviation was .035. The result indicated a  $z_{cal}$  44.552 which was greater than the  $z_{tab}$  of 1.98 and was statistically significant at 5% level of probability. The implication of this finding is that the research institute disseminated their research finding to the farmers in their various communities. How effective is NRCRI in terms of producing disease resistance, early maturing and large yield root and tuber crops. The result showed that the mean 3.40 while the mean standard deviation was .05. The result indicated a  $z_{cal}$  31.177 which was greater than the  $z_{tab}$  of 1.98 and was statistically significant at 5% level of probability. This implies that NRCRI developed improved root and tuber crops varieties that resist disease and mature early.

**Table 7** ANOVA result showing the level of adoption of NRCRI technologies on the livelihood status of individual households

Adoption level of NRCRI technologies	NRCRI IMPROVED TECHNOLOGIES															
	Cassava <i>Manihot Spp</i>			Cocoyam <i>Colocasia Sagittifolium</i>			Sweet potatoes <i>Ipomoea batatas</i>			Yam <i>Dioscorea Spp</i>						
	TMS	F-stat	NR	F-stat	NCE02	F-stat	NCE03	F-stat	UmuSpo1	F-stat	UmuS po2	F-stat	White	F-stat	Yellow	F-stat
Always Adopted	1.00±.000 <sup>b</sup>		1.15±.154 <sup>a</sup>		1.17±.116 <sup>a</sup>		1.25±.087 <sup>a</sup>		2.00±.28 <sup>b</sup>		1.92±.29 <sup>c</sup>		1.00±.00 <sup>0a</sup>		1.08±.077 <sup>b</sup>	
Adopted and Discontinued	1.30±.070 <sup>b</sup>	8.010	2.11±.048 <sup>b</sup>	3.295	1.25±.055 <sup>a</sup>	22.32	1.32±.052 <sup>a</sup>	22.32	2.55±.10 <sup>ab</sup>	3.63	2.57±1.0 <sup>b</sup>	4.61	1.00±.00 <sup>0a</sup>	5.94	1.30±.070 <sup>b</sup>	5.94
Never adopted	2.00±.000 <sup>a</sup>		3.00±.000 <sup>a</sup>		2.00±.174 <sup>a</sup>		1.25±.121 <sup>a</sup>		3.00±.00 <sup>a</sup>		3.00±.00 <sup>a</sup>		1.00±.00 <sup>0a</sup>		2.00±.000 <sup>a</sup>	

**Source: Field Survey, 2017.** Note in mean ± standard error of means of 3 determinations. Values in each row followed by difference superscripts are statistically different at ( $P \leq 0.05$ ). Mean separation was done using Duncan Multiple Range Test (DMRT). Decision:  $H_0$  rejected

Table 7 show the result of ANOVA on the adoption of NRCRI technologies (improved varieties of cassava; cocoyam, sweet potatoes and yam) on the livelihood status of individual households. The result shows that the mean score on the level of adoption of improved variety TMS in the study were 1.00 and 1.30 was at the same level of adoption while farmer 2.0 never adopted TMS. The Duncan multiple range tests used as mean separation technique show that there is a significant difference (F-ratio 8.010). This implies that reasonable farmers in the study area never adopted TMS in other alleviate the alarming poverty within their households. The result still revealed that the mean score on the level of adoption of improved variety NR in the study were 1.15, 2.11 and 3.00 respectively. The Duncan multiple range test used as mean separation technique show that there is a significant difference (F-ratio 3.295) among the level of adoption. This implies that most farmers adopted of NR variety of cassava and stopped. This finding is line with [18], they reported that there is a significant difference among arable crop such as yam, cocoyam and cassava farmer using Duncan multiple range test used as mean separation technique in their study. Table 7 show the result of ANOVA on the adoption of NRCRI technologies (improved varieties cocoyam NEC 001 and NEC 002) on the livelihood status of individual households. The result shows that the mean score on the level of adoption of improved variety of NEC 001 in the study area were 1.17, 1.25 and 2.00 respectively. The Duncan multiple range tests used as mean separation technique show that there is a significant difference (F-ratio 22.23) between their levels of adoption. The results still revealed that the mean score on the level of adoption of improved variety of NEC 002 in the study are were 1.25, 1.32 and 2.00 respectively. The Duncan multiple range tests used as mean separation technique show that there is significant difference (F-ratio 22.23). This implies that there was equal level of adoption of the improved variety NEC 002 among the rural households. Table 7 show the result of ANOVA on the adoption of NRCRI technologies (improved varieties of sweet potatoes; Umu spo 1 and Umu spo 2) on the livelihood status of individual households. The result shows that the mean score on the level of adoption of improve variety of Umu spo 1 in the study area were 2.00, 2.55 and 3.00 respectively. The Duncan multiple range tests used as mean separation technique show that there is a significant difference (F-ratio 3.63). The result implies that some rural households adopted and stopped while some never adopted the variety. The results still revealed that the mean score on the level of adoption of improved variety of Umu spo 2 in the study are were 1.92, 2.57 and 3.00 respectively. The Duncan multiple range tests used as mean separation technique show that there is significant difference (F-ratio 4.61). This implies that rural farmers adoption the various improved varieties of sweet potatoes in other improve their standard of living and also they used it as a cover crop in their farms. Table 7 show the result of ANOVA on the adoption of NRCRI technologies (improved varieties of yam; white yam and yellow yam) on the livelihood status of individual households. The result shows that the mean score on the level of adoption of white yam (*Dioscorea rotundata*) in the study area were 1.00, 1.00 and 1.00 respectively. The Duncan multiple range tests used as mean separation technique show that there is a significant

difference (F-ratio 5.94). This implies that rural households adopted the various yam technologies provide by NRCRI in other alleviate alarming poverty in their various households. The result revealed that the mean score on the level adoption improved variety of yellow yam (*Dioscorea cayenensis*) in the study area were 1.08, 1.30 and 2.00 respectively. The Duncan multiple range tests used as mean separation technique show that there is significant difference (F-ratio 5.94).

## CONCLUSION AND RECOMMENDATIONS

The study has concluded that farmers identified the various NRCRI technologies developed by the research institute and these technologies were effective in alleviating poverty among farmer in Abia. The levels of adoption of the various technologies were high except improved variety cocoyam 'NCE 001' because the mean score was below the bench mark score. It also concluded that poverty level of farmers in Abia were relatively low, indicating that the programme has an effect on their livelihoods.

The study recommends that;

- i. The various technologies developed and disseminated should be sustained and more farmers should encouraged to adopt the disseminated technologies, since the poverty incidence was high.
- ii. Timely supply of farm inputs to farmer
- iii. Government should construct roads to link farms in other to enable farmers transport their produce.
- iv. Prompt payment of salary of research officer and on the service training extension office should be done on regular basis.

## REFERENCE

- [1] Omonona B. T. (2010) "Household poverty and Inequality: The implication of Migrants Remittances in Nigeria" *Journal of Economic Policy Reform* Vol. 13 No. 2 Pp 191-199 techniques in small holder yam based production system in the agro-ecological zones of southwestern Nigeria. *Journal of Human Ecology*, 18(1): 1–12.
- [2] World Bank (2013). Nigeria Poverty in the midst of plenty – The challenge of Growth "With inclusion in the World Bank Poverty Assessment" May 2013 No 14733 United Nations
- [3] Garb, A. (2006). Alleviating Poverty in Nigeria. Paper presented at the Annual Convention of Zumunta Association, Minneapolis, MN, USA, July, 28-29
- [4] Channelstv (2013). Nigeria is not Improving its Human Development Index channelstv.com/home 2913/03/19 Posted March, 2013
- [5] Nwekeaku, C. and Mbanasor, J.A. (1999). "Issues in Rural Development: Nigeria's Challenges". In Nwosu, A.C. Nwajiuba, C.U. and Mbanaso, J.A. (eds) (2000). "Agricultural Transformation in Nigeria, Novelty Industrial Enterprise Ltd, Owerri, Pp. 45-50.
- [6] Food and Agricultural Organization (2013) "Root and Tubers' Agricultural Infrastructure and Agro-Industries division

[www.fao.org/ags/postharvestmanagement/rot-tubers/en](http://www.fao.org/ags/postharvestmanagement/rot-tubers/en) retrieved on 13th September 2013.

- [7] Ewuziem, J. E., Aniedu, C. and Onyenobi, (2013). Acceptability of selected value added products of National Root and Tuber Research Institute Umudike: A test case in Ikwuano Local Government Area of Abia State. Proceeding of the 47<sup>th</sup> Annual Conference of the Agricultural Society of Nigeria.
- [8] National Population Commission (2006). Nigerian Census Report, Abuja 2006
- [9] Ibeagwa, O.B. (2011). "Effect of the Second National Fadama Project on the Income and Welfare of Farm Households in Imo State, Nigeria". M.sc. Thesis, Michael Okpara University of Agriculture Umudike. P78.
- [10] Ezeh, C. I. (2007). Poverty profiles and Determinants of Expenditures of Rural Women Households in Nigeria. The Nigeria Journal of Development Studies 6(1): 187-204
- [11] Akinagbe, A. O. (2010). Challenges in Farmer-Led Extension Approach in Nigeria. World Journal of Agricultural Sciences, 3,353-359
- [12] Nwaobiala, C. U. and Nwosu, I. E. (2015) Effect of Community-Based Programme on the Poverty Profiles of Farmers in Cross River State, Nigeria. World Journal of Agricultural & Biological Science Vol. 2. No.1
- [13] Njoku, J. I. K. (2016) Adoption of Cocoyam Production innovation among Rural Farmers in Imo State, Nigeria. Journal of Community and Communication Research. [www.sccdr.org](http://www.sccdr.org). Vol. 1. No. 2
- [14] IITA. (2013). Healthy yam seed production. IITA Publications. Retrieved from IITA Website <http://www.iita.org/publications>. in Edo State, Nigeria. African Journal of General Agriculture, 6(4): 205–21.
- [15] Izekor, O. B. and Olumese, M. I. (2010). Determinants of yam production and profitability
- [16] Bamire, A. S. and Amujoyegbe, B. J. (2005) . Economic analysis of land improvement
- [17] Aidoo, R. (2009). An analysis of yam consumption patterns in Ghanaian urban communities. Ph.D. Dissertation. Kumasi, Ghana: Department of Agricultural Economics, Agribusiness and Extension, KNUST.
- [18] Nwosu, I. E. and Okringbo, J. I. (2017). Effectiveness of Adaptation Strategies to Climate Variability in Bayelsa State, Nigeria. CARD International Journal of Agricultural Research and Food Production (IJARFP). Vol. 2, No. 2, <http://www.casirmediapublishing.com>