The effectiveness of the National Agricultural Extension and Research Liaison Services (NAERLS) Adopted Village Project on Beneficiaries' Income in Abia State, Nigeria

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Abstract

The study assessed the effectiveness of the NAERLS Adopted Village Project on beneficiaries' farm income in the study area. Purposive and simple random technique was used to select a sample size of 70 respondents. Data were collected using a structured questionnaire, and was analyzed using descriptive and Z-test statistics. The result shows that all the beneficiary farmers attested to have received interventions such as fertilizers, training on soap making, recommended spacing and planting methods as well as linkages with produce market as these, ranked foremost respectively. The study also revealed that the average incomes per hectare generated by beneficiaries are statistically significant. The result from Z-test reveals that the mean annual income of the beneficiaries of the Project was significantly higher (₦383,031.25) than the mean annual income of the non-beneficiaries (₦ 312,671.05) (Z=2.281; P<0.05), this implies that the NAERLS Adopted Village Project had a significant impact on the farm income of beneficiaries of the project. The major constraint to participating in the project was inadequate access to land. The study recommends the review of land use act of 1990 to curb the barrier. The NAERLS should intensify efforts in the pilot villages and scale out its adopted village projects to other parts of the State.

Keywords: Adopted village, Income, Intervention, NAERLS

Introduction

Agriculture has been an essential sector in the Nigerian economy, it accounts for the highest employer of labour, provides food, eradicate poverty and contribute to the overall growth of the economy. In the early 1960s to 1980s, Nigeria was mostly self-sufficient in food production, Agriculture contributed about 42% of the Gross Domestic Product (GDP), employs over 65% of the labour force in Nigeria. However, in recent times, the sector is characterized by low yields, low level of inputs, limited cultivable area, and the use of crude tools contributing only about 20.8% of the GDP to the economy in 2017. (Izuchukwu, 2017).

One of the reasons for the decline in agricultural production according to Eneh, (2008) was poor extension services. According to Olajide *et al.* (2012), less than 50% of Nigeria's cultivable land are cultivated by subsistent smallholder farmers, with about 1-2 hectares under a traditional farming system.

In recent times, deliberate efforts have been made to improve agricultural production through the establishment and implementation of agricultural programmes. The dissemination of information on such programmes and the subsequent adoption of the same by farmers is the primary responsibility of extension workers. However, the agricultural extension system is poorly managed and lack essential resources to adequately take research findings to rural farmers. Thus, efforts by extension systems to transfer technologies to farmers have yielded a minimal result (Babaleye, 2007). Farmers rarely feel the impact of agricultural innovations either because they have no access to such innovation or because the technologies were poorly disseminated (Babaleye, 2007)

The "Adopted Villages Scheme" was introduced to the National Agricultural Research Institutes (NARIs) in Nigeria by the Agricultural Research Council of Nigeria (ARCN) in 2009 following the collapse of National Agricultural Research Project (NARP).

The National Agricultural Extension and Research Liaison Services (NAERLS) is one of the research institutes under the National Agricultural Research Institutes directed by the Agricultural Research Council of Nigeria to establish the adopted village scheme within a 20km distance from their respective head offices to serve as laboratories for showcasing agricultural technologies developed by the research institutes. Thus, the offices of the adopted villages serve as Agricultural Research Outreach Centers (AROCs), jointly managed by the farmers and the NARIs (NAERLS, 2014).

NAERLS, in collaboration with the West Africa Agricultural Productivity Project (WAAPP-Nigeria) conduct activities in over 90 adopted villages located in five agro-ecological zones across the country. Among which includes; Sakadadi in Kaduna State (North West); Nasarawan-Buhari, Kaduna; Tudun-Iya, Katsina; Shuwari in Borno State (North East); Nwogi, Niger State (North Central); Okaragu, Rivers State (South-South); Okolo, Oyo State (South West), and Lodu-Imenyi, Abia (South East).

The objectives of the NAERLS Adopted villages according to NAERLS (2014) are: to enhance food security and market competitiveness; to empower resource-poor farmers; to enhance job and self -employment opportunities for youths and women and to augment sustainable natural resource management efforts of the communities. These objectives are to be achieved through; facilitation, the establishment of management training plots (MTP), capacity building of rural men and women, community development and school programmes (NAERLS, 2014).

However, there is growing concern for the provision of adequate and sustainable agricultural extension services to the majority of smallholder farmers in whose hands the bulk of agricultural production lies. The smallholder farmers are constrained by many problems. Some of which are poor access to modern inputs and credit, poor infrastructure, inadequate access to markets, land and environmental degradation, and inadequate research and extension services. These problems have caused low agricultural production and a continuous rise in the country's import bill on food items over the years even though the country has the human and natural resources to produce sufficient quantity of the food need of the people (Egwemi and Odo, 2013).

In a bid to solve the problem of food production and poverty reduction in the country, the National Agricultural Research Project (NARP) under the World Bank assisted programme in 1997, introduced the Adopted Villages concept. The Agricultural Research Council of Nigeria (ARCN), following the collapse of the NARP, directed the National Agricultural Research Institutes (NARIs), (of which the National Agricultural Extension and Research Liaison Services (NAERLS) is one) to revive the Adopted Villages, culminating into the take-off of the adopted Village project in 2009 (ARCN, 2011). The adopted village project aims to improve the economic and livelihood status of the beneficiary household within the villages in the six geo-political (south-east, south-south, south-west, northeast, north-west and north central) zones.

The technologies transferred to the communities by the NAERLS adopted village project includes: Double-row maize production, maximum density rice production techniques, cassava rapid multiplication, yam mini set, oil palm seedling, use of pesticides, sensitization on HIV/AIDS, skill acquisition and training on soap making, Vaseline production and marketing of product among women, linkage with agricultural banks (NAERLS, 2014).

However, despite the existence of the NAERLS adopted village project in the study area, beneficiaries' economic and livelihood status has not been ascertained. It is against this background that the study seeks to ascertain the effectiveness of the NAERLS adopted village project on a beneficiary's income in the study area.

The specific objectives were to:

i. identify the extension intervention activities introduced to beneficiaries of the project in the study area;
ii. assess the impact of the interventions on the farm income of the beneficiaries
iii. identify constraints faced by the beneficiaries participating in the adopted village project

Hypotheses:

Ho: NAERLS adopted village project has no significant impact on farm income of beneficiaries

Methodology

The study was carried out in NAERLS adopted village located at AmojiLodu-Imenyi in Bende Local Government of Abia State. The State is situated between latitudes 04° 45'N and 06° 07' E and longitudes 07° 00' N and 08° 101'E. Imo, Anambra and Rivers border it in the west, northwest and southwest respectively. It covers a landmass of 6,320 sq. Km. The State is located within the forest belt of Nigeria with a temperature range of between 20°C -36°C lying within the tropics. It has the dry and rainy seasons (October - March and April September) respectively (National Population Commission, 2006).

Abia State has a total population of 2,833,999 with a projected population of 4 million as at 2018 using 3% growth rate (NPC, 2006). The State is made up of seventeen local government areas. Bende Local Government Area is located between Latitude 5^{o} 34' N and 7^{o} 38' E and longitude 5^{o} 567' N and 7^{o} 633' E and has a total population of 192,621 (NPC, 2006) with a projected population of 228,160 as at 2013 using 3% growth rate. Over 80% of the population is involved in agriculture as an occupation. This is supported by the fertile soil in most parts of the State. The major food crops grown in the area include cassava, yam, maize, cocoa, Oil Palm, Rubber, Cashew, Kolanuts and Coconut. The people also engage in livestock and fish farming. Apart from agriculture, commerce is another occupation of people (NPC, 2006).

Agriculture forms the significant means of livelihood of over 70% of the population in both Abia with farming as the predominant occupation. Christianity is the religion practiced in AmojiLodu-Imenyi in Abia State and the predominant language spoken is Igbo. There is also the presence of other ethnic groups (NPC, 2006).

Methodology

A purposive sampling technique was used to select Amojilodu-LoduImenyi being the only established NAERLS adopted village in Abia state. The sample frame for the study was the beneficiaries of the 'Adopted Village Scheme'. All the 32 beneficiaries of the NAERLS Adopted Village Project were purposively selected. Also, 38 non-

beneficiaries were randomly selected from the same village giving a total sample size of seventy (70) respondents.

Primary data were mainly used for this study. The primary data were collected using a well-structured questionnaire.

To complement the primary data, additional data were collected from secondary sources, such as the official reports from NAERLS.

The Z-test model is represented as follows:

$$Z = \frac{\bar{\bar{X}}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_1}}}$$

Where:

Z = the calculated Z-test

$\bar{X}_1$ = mean annual income (₦) of beneficiaries of the project

$\bar{X}_2$ = mean annual income (₦) of non-beneficiaries

S_1 = Standard deviation of beneficiaries of the project

S_2 = Standard deviation of non-beneficiaries of the project

n_1 = sample size of the beneficiaries of the project

n_2 = sample size of non-beneficiaries of the project

Decision: If Zcal>Ztab at (P≤ 0.05) we reject the null hypothesis and accept the alternative hypothesis and vice versa.

. Data collectedfrom respondents were analyzed, using descriptive and z-test statistics

Z-statistic was used to compare the mean income of beneficiaries and non-beneficiaries of the project. It was also used to test hypotheses which states that NAERLS adopted village Project has no significant impact on farm income of beneficiaries.

Results and Discussion

Extension Intervention Activities Introduced to Beneficiaries of the Project in the Study Area

The result in Table 1 shows the distribution of extension interventions activities such as input support, capacity building, farm techniques and innovations and facilitation support to the beneficiaries in the study area.

In the area of input support activities, all the beneficiaries in the study area admitted that they were provided with fertilizers, insecticides and herbicides as this was ranked the foremost. This was followed by the provision of improved seed, maize seed and cassava cuttings which was ranked second. The result implies that beneficiaries' participating in the adopted village's project were adequately provided with farm inputs needed to increase their output as well as income which might invariably improve their livelihood.

In the area of capacity building, the result in Table 1 revealed that respondents among the beneficiaries were taught how to make soap, this was ranked 1st, while training on Vaseline making was ranked second. Soap and Vaseline making was the primary income generating intervention programmes as attested by 88% of the respondents in the adopted village project and so, the majority of the beneficiaries were involved in them. According to Borode (2011) pomade (body cream) and soap making are a major source of income for most women empowerment groups in Nigeria. Other capacity building interventions introduced to the beneficiaries include; training on a tie and dye , making of spices, farm record keeping, training on how to own and assess a bank account. The result implies that, aside from farm activities, most of the beneficiaries were introduced to off-farm income-generating activities which would serve as an additional source of income during the off farming seasons.

Furthermore, in the area of farm techniques and innovations, training on maize and cassava rapid multiplication and training on recommended spacing/planting methods were ranked first and second respectively. Similarly, training on maize and cassava processing was ranked third. Other farm techniques and innovations interventions introduced to the beneficiaries include; use of pesticide as well as sheep and goat entrepreneurship training.

In the area of facilitation support, linkage with produce market ranked 1st as part of the support provided by the project to the beneficiaries. Farmers were also facilitated to participate in joint field days (ranked third), and farmers exchange visit (ranked fourth) and were linked with Bank of Agriculture (ranked fifth). This implies that Linkage with credit institution and input agencies is connected to farmer's access to credit and inputs at cheaper rates and invariably reducing their cost of production. Similarly, the participation in joint field days and farmers exchange visits by the beneficiaries allows for interactions with other farmers and thus provides opportunities for sharing information and improving knowledge.

Table 1: Distribution of extension interventions activities introduced to the beneficiaries of the adopted village's project

Extension Intervention Activities	Freq*	%	Rank
Input support			
Provision of fertilizers	32	100	1st
Provision of improved seed/breeds	24	75	2nd
Provision of maize seed and cassava cuttings	21	66	3rd
Provision of insecticides and herbicides	20	62	4th
Provision of livestock drugs	8	25	5th
Capacity building			
Training on soap making	28	88	1st
Training on Vaseline making	25	78	2nd
Training on tie and dye techniques	18	56	3rd
Groundnut extraction	14	44	4th
Training on spices making	13	41	5th
Trainings on-farm record keeping	11	34	6th
Training on how to own and assess a bank account	8	25	7th
Farm techniques and innovations			
Training on maize and cassava rapid multiplication	32	100	1st
Recommended spacing and method of planting	30	94	2nd
Training on maize, cassava processing	25	78	3rd
Training on use of pesticides	22	69	4th
Sheep and goat entrepreneurship training	19	59	5th
Training on use of tractors and other farm implements	16	50	6th
Facilitation support			
Linking with a produce market	32	100	1st
Participation in joint field days	28	88	2nd
Linkage with input agencies	26	81	3rd
Participation in farmer exchange visit	23	72	4th
Linkage with a bank of agriculture (NACRBD)	20	63	5th
Linkage with a credit institution	18	56	6th
Participation in REFILS workshop	16	50	7th

Multiple Response Allowed*
Field Survey, 2017

Effect of the Interventions on the Beneficiaries' Farm Income

The effect of the intervention provided to the beneficiaries of the adopted village project on their farm

income is presented in Table 2. It shows that about 57% of the project beneficiaries and 66% of the non-beneficiaries realized less than ₦250, 000 in the 2017 cropping season. Only about 8% of the non-beneficiaries had above ₦500,000 compared with 21% of the project beneficiaries who realized greater than ₦500, 000. More of the beneficiaries' income generating capacity had been improved, implying that the NAERLS adopted village project has a significant effect on the income generating capacity of the project beneficiaries.

Table 2: Distribution of beneficiaries and non-beneficiaries by farm income

Farm Income (₦)	Beneficiaries	%		Non- Beneficiaries %
<250,000	18	57	25	66
251,000-500,000	7	22	10	26
501,000-750,000	4	13	3	8
751,000-1,000,000	3	9	0	0
>1,000,000	0	3	0	0

Field survey, 2017

Impact of the Project on the income of the respondents and test of hypotheses

The result of the impact of the project on the income of the respondents is presented in Table 3. The mean income of the respondents among the beneficiaries and non-beneficiaries in the study areas were subjected to Z-Test statistics. It was found that the mean income of the respondents among the beneficiaries and non-beneficiaries was ₦383,031.25 and ₦ 312,671.05 respectively. The difference between the mean value of beneficiaries and non-beneficiaries is ₦70,360.2. It indicates that the mean difference estimates of the income of beneficiaries and non-beneficiaries of the project had a positive value. The implication is that the project had a positive impact on the income of beneficiaries. A positive mean difference in income value indicates the positive impact of the project on beneficiaries' income (Nkonya *et al*., 2008). Also, it was found that the income of the beneficiaries was significantly different from the income of the non-beneficiaries at 5% level of significance at a two-tail test ($z=2.281; P<0.05$). The z-calculated (2.281) was greater than the z-critical (1.96) at a two tail test. Therefore the null hypothesis was rejected, and the alternate hypothesis accepted.

Table 3: Result of Z-test statistic of the impact of the project on the income of respondents

Variable	Beneficiaries Income (₦)	Non-beneficiaries Income (₦)
Mean	383031.25	312671.05
Standard deviation	1.95E+11	5.07E+10
Observations	32	38
Hypothesized Mean Difference	0	
Z-stat	2.281**	
P(Z<=z) one-tail	0.011265	
Z-Critical one-tail	1.644854	
P(Z<=z) two-tail	0.02253	
Z-Critical two-tail	1.96	

**P<0.05

Field survey, 2017

Constraints to Participating in the Adopted Village Project

The constraints to participating in the adopted village project by the respondents in the study area were presented in Table 4. It was found that beneficiaries ranked limited land as the first constraint. This finding agrees with that of Egbuna (2008) who identified some of the constraints to the development of urban agriculture in Nigeria as inadequate access to land, lack of support services (credit, extension and inputs supply), theft of crops on the farm and high cost of labour among others. Inadequate storage facilities ranked second. Also,

inadequate processing facilities and the high cost of production ranked third and 4thconstraints, respectively. This problem has caused the prices of farm produce to fluctuate with the season; farmers were either forced to sell their produce at harvest at a meagre price (Emeka, 2007). The findings in Table 4 was also in line with the report of Afolami and Ayinde (2002) who noted that low productivity of tomatoes in Ogun state was caused mainly by high cost of inputs.

Table 4: Constraints to participating in the adopted village project by the beneficiaries

Constraints	Frequency	%	Rank
Limited of land	32	100	1st
Poor storage facilities	27	84	2nd
Poor processing facilities	24	75	3rd
The high cost of production	21	66	4th
Poor Market	18	56	5th
Fertilizer shortage	13	41	6th

Multiple Response Allowed*
Field survey, 2018

Conclusion

Based on the findings of this study, it was concluded that the NAERLS Adopted Villages Project had a significant impact on the livelihood of its beneficiaries as indicated by a positive mean difference in income values between the beneficiaries and non-beneficiaries of the project. The Z-test result also shows that the interventions have a statistically significant effect on the beneficiaries' farm income

Recommendations

Based on the findings, the study recommends the following

i. Most of the respondents complained of limited land as foremost constraints in participating in Adopted Village Project. To address this, the government can acquire vast expanse of land and lease out to the farmers at a subsidized rate. This approach would enhance access to land and reduce land rental value. The abandoned lands of the defunct River Basin Development Authorities lying idle in almost all the States of the federation can serve this purpose. The Land Use Act of 1990 in Nigeria should be reviewed to facilitate access to land by landless peasantry who produce the bulk of the agricultural produce.
ii. Farmers should form production clusters to improve their storage as well as market intelligence. It could be achieved through cooperatives association.
iii. The Adopted Village Project should be scaled up and out, that is, the NAERLS should intensify its efforts in the already adopted villages and replicate the project in other neighbouring villages in the state.

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