

**ANCHOR BORROWERS' PROGRAMME AND POVERTY
LEVEL AMONG SMALLHOLDER FARMERS IN
BENUE STATE, NIGERIA:
Implications for Economic Recovery and Growth Plan**

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ABSTRACT

This study investigated the impact of the Anchor Borrowers' Programme (ABP) on the poverty level of smallholder farmers in Benue State and the implications for the Economic Recovery and Growth Plan (ERGP). Using a cohort survey design, 382 beneficiaries were selected for the investigation. The paper used analytical techniques including tables, simple percentages, charts, paired t-test, FGT poverty indices and a logit model to analyse the collected data. Findings revealed that beneficiaries of the ABP have increased farm sizes without corresponding increase in farm output and income. Further investigation revealed that factors such as late supply of farm input, unproductive seedlings and unfavourable climatic conditions were responsible for poor yield and non-increase in the income of beneficiaries. Given that the income of the beneficiaries did not increase, the programme was considered to have failed to reduce poverty in the state as expected. Findings again showed that only 4% of beneficiaries were lifted from core poor status to moderately poor status and only 1% of the beneficiaries were lifted from moderately poor status to non-poor status after benefiting from the programme. Furthermore, findings from the logit regression model showed that benefiting from the ABP is likely to improve the quality of life of the beneficiaries if implementation challenges are tackled. The implication is that, proper implementation of the ABP will have positive impact on the implementation of the ERGP by providing

employment and reducing poverty as well as increasing agricultural output for domestic consumption and export. Increases in agricultural production and export will reduce the total dependence of the economy on oil. To achieve this, the paper recommends that the implementation strategy of the ABP in Benue State should be changed to ensure timely supply of farm inputs. Also, there must be proper monitoring of the farming activities of the beneficiaries by agricultural extension workers to ensure strict compliance with best farming practices for enhanced productivity in the state.

Keywords: Anchor Borrowers' Programme, Benue State, Economic Recovery and Growth Plan, Logit regression, Paired t-test, Poverty

JEL classification: Q18, I31, I32

1. Introduction

Before oil was discovered in Nigeria, agriculture was the main pillar of the Nigerian economy providing income and employment for its teeming population. However, with the discovery of oil, the agricultural sector was relegated to the background and oil was put on the front burner of the economy, contributing 75% of government revenue and 90% of foreign exchange earnings (Central Bank of Nigeria, 2015). Following the slump in oil prices from 2014 to 2016, which threw the Nigerian economy into recession, concerted efforts are being made to salvage the economy from this precarious situation and forestall future reoccurrences. Towards this end, the Central Bank of Nigeria (CBN) launched the Anchor Borrowers' Programme (ABP) in 2015. The aim of the programme was to link the anchor agro-processing companies with smallholder farmers (SHFs) of selected agricultural commodities. The policy focus of the programme was to provide farm inputs and money to these smallholder farmers to enable them increase the production of identified agricultural products in order to increase their income and reduce poverty among them.

In Benue State, Miva rice and SERAP were the anchors at the inception of the programme, but the state government later provided counterpart funding of ₦27million, and 16,950 farmers were trained to participate in the programme towards the production of rice and soya beans. However, only 8,700 farmers eventually benefited from the programme in the state.

Benue State is an agrarian state (nickname 'Food Basket of the Nation') with a high poverty profile and high unemployment levels. The National Bureau of Statistics (NBS) report (2019) ranked the state as the 20th poorest state in the Federation, with a poverty headcount ratio of 32.9%. Benue farmers depend solely on agriculture for livelihood, which according to Ikwuba (2011) is not rewarding because of its subsistence status.

Given that the poverty situation is serious, and agriculture in the state is highly subsistent because of the paucity of finance, a programme like the ABP is expected to have positive impact on the quality of life of the beneficiaries in the state because of the backward and forward linkages of the agricultural sector. Thus, with the implementation and the participation of the state in the programme, the following questions arise:

1. What is the impact of the ABP on smallholder farmers' output in Benue State?
2. What impact does the ABP have on the incomes of smallholder farmers in Benue State?
3. What is the effect of the ABP on the poverty level (i.e quality of life) of beneficiaries in the state?
4. What implication does the ABP have for the Economic Recovery and Growth Plan?

Answering these questions is the thrust of this study. The objective of this study, therefore, is to investigate the impact of the ABP on smallholder farmers' output, income and poverty level in Benue State and its implications for the Economic Recovery and Growth Plan. To this end, the rest of this paper is organized into six sections. Section 2 gives conceptual clarification while section 3 deals with the theoretical review. Section 4 presents the empirical literature and section 5 the methodology of the study. Section six discusses the empirical findings of the study and section 7 concludes and presents policy recommendations.

2. Conceptual Clarification

A conceptual exposition of the concepts of the Anchor Borrowers' Programme, poverty and economic recovery and growth plan is given in this section.

2.1 Concept of the Anchor Borrowers' Programme

The Anchor Borrowers' Programme is an agro-based programme of the Central Bank of Nigeria aimed at boosting agricultural production, processing and marketing in the country. The programme targets smallholder farmers involved in the production of key agricultural commodities such as rice, maize, wheat, cotton, cassava, potatoes, yam, ginger, sugarcane, oil palm, cocoa, rubber, soybean, sesame seeds, cowpeas, tomato, fish, poultry, ruminants and any other commodity that may be introduced by the CBN from time to time, or the anchors who are the major processors of these commodities (CBN, 2016).

The smallholder farmers are given farm inputs and money to increase their production and upon harvest, they are expected to sell their produce to the anchors at the prevailing market prices. The objectives of the ABP include:

1. to increase agricultural output in the country thereby increasing food security, employment and income levels of smallholder farmers with a view to reducing poverty in the country;
2. to increase the capacity utilization of agro processors and reduce food importation with a view to conserving scarce foreign exchange in the country.
3. to increase bank lending to the agricultural sector (CBN, 2016).

2.2 Implementation plan of the Anchor Borrowers' Programme

The implementation plan of the CBN Anchor Borrowers' Programme comprises three segments: out-grower support programme, training of farmers, extension workers and banks, and risk mitigation.

i. Out-grower Support Programme

The out-grower support programme involves the financing of the agricultural activities of the smallholder farmers to effectively boost their production. To achieve this, the CBN has earmarked ₦20 billion out of the ₦220 billion for the Micro, Small and Medium Enterprises Development Fund (MSMEDF) for farmers. Eligible financial institutions are expected to access the funds at an interest rate of 2% from the CBN and disburse to the farmers at a maximum interest rate of 9%. The farmers are in turn expected to pay back the borrowed

amount upon sale of their farm produce to the anchors at the prevailing market prices (CBN, 2016).

ii. *Training of Farmers, Extension Workers and Banks*

This component of the programme involves the training of the farmers, extension workers and banks on best international agricultural practices. The farmers are taught skills aimed at enhancing their allocative and technical efficiencies in the production of the selected agricultural commodities. Extension workers are also trained to guide and direct the farmers in the field on how best to carry out their farming activities, while bank staff are trained to monitor the utilization of the funds disbursed to the farmers with a view to avoiding fund diversion and to enhance loan performance (CBN, 2016).

iii. *Risk Mitigation*

This stage deals with the risk mitigation strategies that have been incorporated into the ABP model in order to ensure success. These strategies are presented in table 1.

Table 1. Risk Mitigation Strategies of ABP

S/NO	Risks	Mitigants
1.	Poor farming techniques/low yield	Comprehensive farmer education/technical assistance
2.	Skill gap among credit officers in agriculture financing	Value-chain finance training for banks
3.	Poor monitoring of the process/projects	Project Management Team (PMT), comprising all stakeholders, to effectively monitor implementation
4.	Farmers have no commitment to the programme	Equity contribution of 5%-10%
5.	No market for products	Off-takers in place with MoUs executed
6.	Price variation	Guaranteed minimum price by FMARD in place
7.	Loss of crops due to flood/drought/natural disasters	NAIC agricultural insurance is compulsory
8.	Poor quality/fake inputs leading to low yields	PMT selects recognized agro dealers
9.	Diversion of funds by farmers	Direct disbursement to agro dealers

S/NO	Risks	Mitigants
10.	Side selling by farmers	<ul style="list-style-type: none"> • Farmer selection by miller • Cross guarantee by all members of the cooperative • Miller approves all disbursement requests by farmers • Use of extension workers • MoU to be executed between the millers, farmers and financing banks to curb the incidence of side selling • The cooperative to which erring farmer belongs to be excluded from the programme and from future CBN funding
11.	Default by miller <ul style="list-style-type: none"> • No funds to purchase paddy • Reneges on MoU agreement • Diversion of funds 	<ul style="list-style-type: none"> • CACS funding available for direct purchase of paddy • Miller will be banned from future CBN funding • Bank debits miller's account and credits loan account of farmer
12.	Default in loan repayment by farmers	50% credit guarantee in the event of default
13.	Challenges of infrastructure	Government to provide infrastructural facilities like Fadama feeder roads, irrigation facilities, etc.

Source.: CBN (2016).

2.3 Poverty

There is no concise definition of the concept of poverty, however, attempts have been made to define the term 'poverty' variously. The World Bank (2001) for instance, defines poverty as the state of material deprivation which could be in the form of physical things (such as food, healthcare, clothing and education), non-physical things (such as participation identity) that are required for a meaningful life. Obadan (2001) further confirmed this view by saying that poverty is a general state or condition of deprivation whose dimension includes isolation, vulnerability, powerlessness, humiliation, physical weakness. Furthermore, Aliyu (2002) explained poverty as the condition in which an individual is not able to afford the basic required food, medication, shelter, and access to basic educational services.

Basically, all the definitions point to the fact that poverty is the inability of an individual to have access to the basic necessities of life for a decent living. It has to be considered as a state of deprivation which places an individual or group at a position of disadvantage when compared to others. Hazell and Haddad (2001) asserted that poverty is made up of two interactive deplorable conditions that deprive an individual of a decent living condition; these are physiological deprivation and the social deprivation. Physiological deprivation is concerned with how individuals are unable to meet the basic necessities of life such food to eat, access to education, access to medical care, shelter, and good water to drink, largely due to lack of sustainable incomes.

Social deprivation on the other hand, has to do with lack of human dignity and low self-esteem precipitated by lack of empowerment in one's society. Schubat (1994) then categorized poverty into two, namely; absolute poverty and relative poverty. Absolute poverty is the inability to access the basic necessities for a minimum required standard of living as a result of lack of income; while relative poverty is concerned with the comparison of one's living condition with that which is obtainable in the society or environment of his or her dwelling at a particular point in time. In this study, absolute poverty is the type of poverty considered, since smallholder farmers are basically concerned with mere basic subsistence.

2.4 Economic Recovery and Growth Plan (ERGP)

The Economic Recovery and Growth Plan is Nigeria's national economic resilience plan in response to the oil price shock that plunged the economy into recession. It is a medium-term plan that was expected to span 2017 to 2020. The plan is anchored on the zero oil plan philosophy that is aimed at diversifying the economy and steer it away from oil dependence. The plan focuses on agriculture, energy, MSME, manufacturing and services to restore the growth of the economy (Ministry of Budget and National Planning, 2017). The plan sees agriculture as a critical sector that can be harnessed to restore the growth of the Nigerian economy. It considers agricultural transformation as a veritable strategy for achieving food security, increased exports, generation of sustainable income and employment, and achieving a globally competitive economy. The plan aimed at achieving inclusive growth by investing in people through social investment programmes and the implementation of the ABP. The ABP target

was to lift millions of smallholder framers out of the poverty trap (Ministry of Budget and National Planning, 2017).

3. Theoretical Review

This study is hinged on the theoretical foundations of the unbalanced growth theory and the change theory of development. The unbalanced theory of growth was popularized by Hirschman. The theory posits that because of paucity of resources, countries should select a strategic sector or sectors of the economy which have high connectivity with other sectors and invest in such sector(s). According to the proponents of this theory, developing countries do not have the required resources to develop all sectors at the same time. Thus, predicated upon this premise, a sector or sectors with high positive spillovers should be first developed so that development can trickle down to the other sectors of the economy (Jhingan, 2008).

The thrust of the unbalanced growth theory is that developing countries should examine the various sectors of their economies and carefully select a sector or sectors of their economies and concentrate investment in the selected sector(s) so that the positive spillovers from these selected sector(s) will be transmitted to the remaining sectors to achieve long-run growth and development.

This theory is suitable for this study because it is in line with the implementation strategy of the ERGP where the agricultural sector is one of the sectors selected to kick-start growth and development in Nigeria by leveraging on the backward and forward linkages associated with the agricultural sector.

The change theory of development was propounded by the United Nations Children's Fund (UNICEF) in 2014. The theory is essentially used for impact assessment studies, especially for intervention programmes and policies like the ABP. The change theory tries to explain how an interventionist programme can be implemented at different phases to arrive at the predetermined objective of the programme (Rogers, 2014).

The theory of change posits that every intervention programme has clearly stated objectives to be achieved, the target beneficiaries are clearly identified, the partners and stakeholders are also clearly identified, the needed resources to execute the programme are estimated and sources of financing the programme

are identified beforehand, and the implementation strategies are clearly stipulated (Vogel, 2012). The change theory believes that an intervention programme has various phases of implementation. Thus, to achieve the final result, each phase of the programme must be carefully monitored and evaluated with a view to ascertaining the level of progress made at each stage of the programme (Allen, 2011).

The theory's process of implementation including chain of results is shown in the figure 1.



Figure 1. Implementation Process of the Change Theory.

Source: UNICEF, 2014.

According to Allen (2011), the inputs, activities, output, outcomes and impact of a change theory can be explained as follows:

Inputs: This has to do with the resources used in implementing the programme or policy. Under the Anchor Borrowers' Programme (ABP), farmers are given farm inputs and cash to undertake their farming activities.

Activities: Activities under the ABP have to do with the farming activities that the farmers engage in using the farm inputs and the cash given to them.

Output: This is concerned with the immediate and short-term effects of the programme. In the context of the ABP of the Central Bank of Nigeria, it is the number of farmers who have benefited from the programme and how much loans they have received as well as the changes in their output.

Outcome: This has to do with the expected short-term and medium-term effects of the programme outcome. In the context of the ABP, it has to do with incomes and improvement in the quality of life of the beneficiaries.

Impact: This is concerned with the positive and long-term effects produced by a development intervention, directly or indirectly, intended or unintended. Under the ABP, this would be the impact on the poverty level of beneficiaries and the subsequent impact on the ERGP.

Given the postulations of the change theory, it is deemed appropriate for this study. This is because the CBN's Anchor Borrowers' Programme is an

intervention programme which has clear-cut objectives and which is to link smallholder farmers and the anchors (agro-processors), with the aim of increasing smallholder farmers' agricultural output and income levels, with a view to increasing employment and reducing poverty in the country.

4. Empirical Literature

This section explores related empirical studies in order to provide an insight into the findings of these studies with the aim of relating such works with the current study.

In a study to assess the impact of the ABP in Benue State, Okeke, Mbanasor and Nto (2019) investigated the effect of ABP access among rice farmers in Benue State. The study used non-beneficiaries of the programme as a counterfactual group. Using the independent t-test and the Endogenous Switching Regression Model (ESRM), the study found that the farm output and income of ABP beneficiaries were significantly higher compared to that of non-beneficiaries. Also, the study found that rice farmers' access to ABP was significantly influenced by their socio-economic characteristics and that non-beneficiary rice farmers were no better or worse in terms of farm income than a random rice farmer from the sample. The findings from the ESRM further showed that beneficiary rice farmers acquired less productive assets than what a random rice farmer from the sample earned; while a non-beneficiary rice farmer acquired more productive assets than what a random rice farmer from sample earned.

The Okeke et al. (2019) study, though on ABP in Benue State, is different from the current study in many respects. First, the previous study focussed on only rice farmers who benefited from the ABP in Benue State; while the current study is focussed on both rice and soya beans farmers, who have benefited from the programme. This provides the current study with the opportunity to comprehensively assess the programme. Second, the previous study used beneficiaries and non-beneficiaries to assess the impact of the ABP while the current study used only beneficiaries and considering their farming activities before and during the ABP. This again provides a better measure for assessing the impact of the programme in that, this measure maintains the technical and allocative efficiencies of the same farmer. As a result, it is easier to identify the impact. Finally, the previous study did not consider the impact of the programme

on the poverty status of the farmers which is the major focus of the programme. Thus, it is clearly different from the current study.

Similarly, Badejo and Adekeye (2018) investigated the impact of the ABP on poverty alleviation in Argungu Local Government Area (LGA) of Kebbi State. The study used descriptive analysis and found that ABP had positive and significant impact on poverty alleviation in Argungu LGA of Kebbi State in terms of food supply, employment creation, and income generation, and has enhanced the standard of living of the beneficiaries. Emergent from the findings of the study, it was recommended that the ABP in Nigeria should be encouraged but must be reviewed periodically in order to provide more opportunities for poverty reduction among farmers in the country.

The study by Badejo and Adekeye (2018), though on the ABP and poverty alleviation, differs from the current study in terms of geographical location and methodological approach. The previous studied the beneficiaries of the ABP in Argungu LGA of Kebbi State with a different social, cultural and economic background from the beneficiaries considered in the current study. Also, the methodologies used in the two studies are different; the previous study only used the descriptive approach in assessing the impact of ABP on poverty alleviation while the current study used more robust and conventional poverty analytic tools in assessing the impact of the programme on the poverty status of beneficiaries in Benue State.

Ikpe and Udeh (2011), in their work, studied the efficiency of inputs allocation by loan users and non-loan users among smallholder poultry farmers in Delta State of Nigeria. The study employed the stochastic frontier model for the investigation. The results showed that credit users overutilized labour and used less feed inputs. It was also found that loan farmers used less of drugs and veterinary services than the non-loan farmers. This study made commendable efforts in providing useful insight into the allocative efficiencies of loan users and non-loan users, but it is different from the current study in that it is not based on an interventionist programme like the ABP which the current study assessed.

Furthermore, Oboh (2008) investigated the credit allocation behaviour of farmers in Benue State. The study employed the VECM approach and found that farmers do not efficiently allocate credit to farming activities. On the basis of this finding, the study recommended that for agricultural loans to be useful, the beneficiaries of such loans must efficiently utilize the loans and allocate the

loans to farming activities. This study made commendable efforts in unravelling the allocative behaviour of farmers in credit utilization in Benue State, but it is different from the current study because the current study is based on the ABP with different dynamics from other credit policies to farmers in the state.

Awoke (2004) examined the factors militating against credit collection and repayment levels among smallholder farmers in Nigeria. The study found that lack of collateral and high interest rate were the major impeding factors to loan acquisition, while poor credit allocation and loan diversion were found to be responsible for poor the loan repayment attitude among smallholder farmers in the country.

From the empirical literature reviewed, it is clear that the current study is different from previous similar studies. Its uniqueness stems from the fact that it is based on a current agricultural intervention programme by the CBN. Though some of the empirical works reviewed in this study have investigated the ABP, they have failed to link up the programme with the ERGP, which is the medium-term plan for 2017 to 2020 which necessitated the implementation of the ABP. The current study has uniquely assessed the impact of the ABP on the poverty status of smallholder farmers in Benue State and has attempted to explore the implications it has for the ERGP by providing the policy responses required to use the ABP to achieve the ERGP in Nigeria.

5. Methodology

This section presents the methodological approaches used in achieving the objective of this study.

5.1 Study area

The study area for this paper is Benue State. Benue State is one of the thirty-six states of the country, Nigeria. The state has a population of about 5,789,952 people, based on the 2016 census projections (Tser, 2013). Benue State has twenty-three local government areas and its capital is Makurdi. For administrative purposes, the state is segmented into three geo-political zones, namely Zone A, Zone B and Zone C.

Benue State is predominantly an agrarian state with the majority of the inhabitants being farmers. Given the high level of agricultural activities in the

state, it's sobriquet is 'Food Basket of the Nation'. The common agricultural commodities grown in the state are: yam, rice, cassava, soya beans, guinea corn, tomatoes, pepper, ginger, sweet potatoes, maize, and groundnuts. For citrus, the state largely produces oranges, mangoes, and cashews.

The agricultural activities in the state are largely subsistence level and many have attributed this to challenges which include paucity of funds, post-harvest losses, farmers-herders' crises, communal clashes, poor infrastructural facilities such as roads and electricity, among others.

5.2 Study population and sampling technique

The study's population comprises 8,700 farmers who benefited from the ABP during the 2017 farming season. The Taro Yammene's formula was used in the determination of the optimal sample size for investigation. The formula is stated as:

$$n = \frac{N}{1 + N(e^2)} \quad (1)$$

where n is the desired sample size, e is the level of significance, N is the study's population, which is 8,700 beneficiaries of the ABP in Benue State.

$$\text{Thus, } n = \frac{8,700}{1 + 8,700(0.05^2)} = 382$$

Therefore, the optimal sample size of the beneficiaries of the ABP in Benue State for this study is 382.

Furthermore, Boyce's allocation formula was used to determine the proportions of rice and soya beans farmers in the determined sample size of 382 as follows:

$$\text{For rice, } n = \frac{4,769}{8,700} \times 382 = 209 \text{ beneficiaries}$$

$$\text{For soya beans, } n = \frac{3,931}{8,700} \times 382 = 173 \text{ beneficiaries}$$

The cluster sampling procedure was therefore applied to select 209 rice beneficiaries and 173 soya beans beneficiaries. The cluster sampling technique

was deemed most appropriate in this study because the beneficiaries of the ABP were grouped into clusters for ease of monitoring. A cluster comprised a maximum of 15 beneficiaries. In so doing, 20 clusters of rice and soya beans ABP beneficiaries were each randomly selected, that is, approximately 300 beneficiaries each for rice and soya beans. Thus, to arrive at the 209 rice beneficiaries and 173 soya beans beneficiaries, a simple random sampling technique was employed using the lottery method where the serial numbers of the beneficiaries in the selected clusters were written on pieces of paper folded and shuffled in a container and then randomly picked. Finally, the picked serial numbers were used to trace the location and contacts of the selected beneficiaries for questionnaire administration. The cluster heads of the various clusters immensely assisted in the questionnaire administration.

5.3 Analytical techniques employed

The analytical tools used in this study include descriptive statistics such as percentages and the Foster, Greer and Thornbecke (FGT) index, while the paired t-test was used to measure whether significant differences exist in the beneficiaries' land cultivated, output, and income before and during the ABP. Finally, a logit regression model was used to ascertain whether or not benefiting from the ABP has the probability of reducing poverty among the beneficiaries.

5.3.1 The FGT Index

This index was brought to limelight by Foster, Greer and Thornbecke in 1984. The index incorporates the poverty head count ratio, poverty gap and the depth of poverty (Anyanwu, 1997). The headcount ratio which measures the proportion of people below the poverty line is given as:

$$H = \frac{Q}{N} \quad (2)$$

where:

H = value of the headcount ratio to be computed. It is expected to range from 0 to 1; the closer H is to 1, the higher the number of beneficiaries below the determined poverty line.

Q = number of beneficiaries of the ABP below the poverty line

N = total number of beneficiaries of the ABP investigated in the study.

The poverty gap which measures the dispersion of the peoples' mean income level from the poverty line is expressed as:

$$P_{\alpha} = \frac{1}{N} \sum_{j=1}^N \left(\frac{Z - Y_j}{Z} \right)^{\alpha} \quad (3)$$

where:

P_{α} = poverty gap

Z = determined poverty line for the study,

Y_i = income level of the i th beneficiary in poor category,

α = the FGT parameter value which is expected to range between 0, 1 and 2

N = number of beneficiaries of the ABP studied (Oyedeji, and Adebayo, 2013).

5.3.2 Logit Regression Model

A logit model is a qualitative binary regression type that is widely used for poverty investigations. Studies such as Yusuf, Adesanoye and Awotide (2008), Imran, Shahnawazi and Abo (2009), and Akighir, Ngutsav, and Asom (2011) have used this model to investigate various poverty-related issues. Traditionally, the endogenous variable is binary in nature; "1" connotes that the household is poor and "0" connotes that household is not poor. The general form of the logit regression model is expressed as:

$$\ln \left[\frac{P_i}{1 - P_i} \right] = Z = \alpha + \beta X_i + \mu \quad (4)$$

where:

Z = binary qualitative variable classifying households into poor and non-poor;

X_i = specific characteristic of the households under investigation; and
 μ = residual of the logit model.

In this study, the logit regression model is specified as:

$$pov = f(edu, fexp, loan, inabp, cfarms, intabp, modep) \quad (5)$$

where:

pov = poverty level of the households computed in line with the World Bank poverty line of 1.9 dollars. Using ₦305 per \$ per day, any beneficiary whose income is below ₦579.5 per day is considered poor and any beneficiary whose income is above ₦579.5 per day is considered non-poor. Thus, for poor households, the value of “1” is assigned and for non-poor households, the value of “0” is assigned.

edu = educational attainment level of the beneficiary

$fexp$ = years of farming of the beneficiary

$loan$ = amount of loan a beneficiary has collected from the financial institution

$inabp$ = income earned from the activities of ABP

$cfarms$ = change in farm size as a result of ABP activities

$intabp$ = interest rate charged by financial institutions for ABP loans

$modep$ = mode of payment of the ABP loan by the beneficiary

The econometric form of model 5 is stated in equation 6 as:

$$pov = \alpha_0 + \alpha_1 edu + \alpha_2 fexp + \alpha_3 loan + \alpha_4 inabp + \alpha_5 cfarms + \alpha_6 intabp + \alpha_7 modep + \mu \quad (6)$$

where:

α_0 = intercept of the mode;

$\alpha_1 - \alpha_7$ = estimated parameters of model 7. Model 7 was estimated using the maximum likelihood estimation technique.

6. Empirical Results

In this study, 382 copies of the questionnaire were distributed but only 375 of the retrieved questionnaires were valid, representing 98.2%, while the mortality rate was only 1.8%. Thus, the data analysis in this study is based on the 375 valid questionnaires retrieved.

6.1 Socio-economic attributes of the beneficiaries

The socio-economic attributes of the beneficiaries are shown in table 2.

Table 2. Socio-economic Attributes of the Beneficiaries

Variables	Frequency	Percent
Sex		
Male	194	51.73
Female	184	48.27
Age		
18-30	87	23.2
31-45	184	49.07
46 and Above	104	27.73
Educational Attainment		
No Formal Education	0	0
Primary Education	6	1.6
Secondary Education	102	27.2
Tertiary Education	267	71.2

Source: Field survey, 2019.

Table 2 reveals that 51.73% of the beneficiaries were male and 48.27% were female. This implies that benefiting from the ABP does not depend on gender; since both male and female farmers were fairly represented. Also, the table shows that the ages of the farmers ranged from 18 to above 46 years, with those aged 31- 45 years being in the majority (49.07%). This suggests that farmers of all ages benefited from the programme. The minimum age of 18 years may have to do with attaining legal age. This may be because of legal implications. Finally, table 2 reveals all the sampled beneficiaries have acquired formal education with a majority (71.2%) having tertiary level qualifications such as Diploma, Higher Diploma, NCE, first degrees, master degrees, amongst others.

6.2 Classification of the beneficiaries by crop types

The beneficiaries were classified based on the type of crops they cultivated. This classification is presented in table 3.

Table 3. Classification of Beneficiaries by Crop Types

Type of Crop	Frequency	Percent
Rice	206	54.93
Soyabeans	169	45.07
Total	375	100.00

Source: Field survey, 2019.

Table 3 reveals that 54.93% of the beneficiaries cultivated rice and 45.07% cultivated soya beans. The Benue State ABP actually trained beneficiaries in the cultivation of these two crops. The selection of these two crops may be because of the comparative advantage the state has in the production of these crops and partly because of the availability of agro-processors of these crops in the state.

6.3 Inputs collection by the beneficiaries

The various inputs collected by the sampled beneficiaries of the ABP are shown in table 4.

Table 4. Classification of Beneficiaries According to Inputs Received

Input Types	Frequency	Percent
Seedlings	All (375)	100
Herbicides	All (375)	100
Fertilizers	All (375)	100
50 Thousand Naira	All (375)	100

Source: Field survey, 2019.

The table reveals that all the 375 sampled beneficiaries indicated that they received inputs for rice and soya beans. These included seedlings, herbicides, fertilizers, and fifty thousand naira to pay for labour.

6.4 Size of land cultivated by beneficiaries before and during the ABP

Figure 2 shows the land cultivated by the beneficiaries in hectares before and during the ABP.

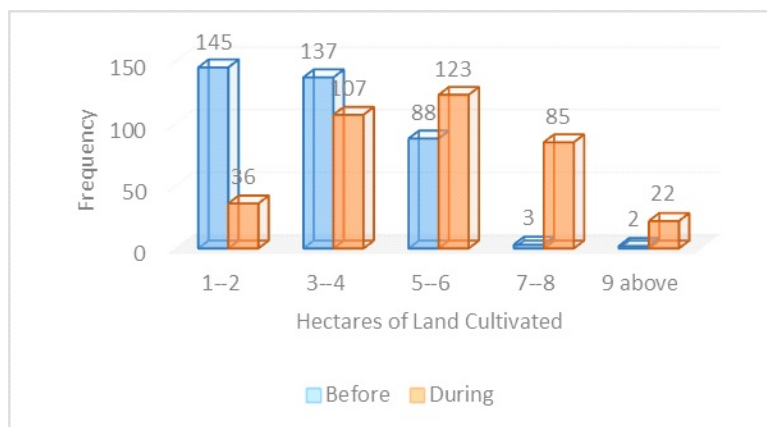


Figure 2. Land Cultivated Before and During the APB.

It is evident from the figure that before the ABP, 145 beneficiaries were cultivating 1-2 hectares of land, but after benefiting from the ABP, only 36 beneficiaries were cultivating 1-2 hectares of land. The figure also reveals that before benefiting from the ABP, 134 beneficiaries were cultivating 3-4 hectares of land, but after benefiting from the ABP, 107 beneficiaries were cultivating 3-4 hectares of land.

Furthermore, 88 beneficiaries were cultivating 5-6 hectares of land and after benefiting from the programme, this number increased to 123 beneficiaries. The figure also indicates that only 3 and 9 beneficiaries were cultivating 7-8 hectares and 9 hectares of land and above respectively before benefiting from the ABP. However, after benefiting from the ABP, the number of beneficiaries increased exponentially to 85 and 22 respectively. This suggests that benefiting from the ABP led to the cultivation of larger hectares of land by the beneficiaries. This may be because farming inputs were given to them which enabled them to increase the hectares of land cultivated.

In order to know whether or not the increases were statistically significant, the paired t-test was employed and the results are presented in table 5.

Table 5. Paired t-test of the Mean Land Cultivated before and during the ABP

Mean Hectares of Before the ABP	3.22	Paired t-test	Significance
Mean Hectares of During the ABP	7.82	3.442	0.0324

Source: Authors' computation.

The table shows a t-test value of 3.442 which is statistically different from zero at 5% level of significance. This suggests that benefiting the ABP has significantly increased the land cultivated by the beneficiaries.

6.5 Farm output of the farmers before and during the ABP

The farm output of the beneficiaries before and during the ABP is presented in the figure 3. A cursory look at the figure suggests that participating in the ABP has not increased the farmers' output as expected. However, with recourse to figure 2, which shows that the land cultivated has increased, it suggests that there were implementation challenges or climatic conditions that were not favourable during the farming season under reference.

In order to know whether the non-increase in output is statistically significant or not, the paired t-test was computed and the results are shown in table 6.

Table 6. Paired t-test of the mean of farm output before and during the ABP

Mean farm output before the ABP	12.8	Paired t-test	Significance
Mean farm output during the ABP	13.3	0.345	0.543

Source: Authors' computation.

The table shows that the t-test value of 0.345 is not statistically different from zero, which implies that benefiting from the ABP has not significantly improved the beneficiaries' output.

6.6 Income of beneficiaries before and during the ABP

The income of the beneficiaries before and during the ABP is presented in figure 4.



Figure 4. Income of the Beneficiaries Before and During the ABP.

The figure shows that before benefiting from the ABP, the 222 beneficiaries were earning between ₦50,000 and ₦75,000 from farming activities annually, but this number dropped to 209 after benefiting from the ABP. Furthermore, the figure reveals that before benefiting from the ABP, 123 beneficiaries were earning between ₦76,000 and ₦105,000 from farming activities, but this increased to 142 after benefiting from the ABP. Also, 25 beneficiaries were earning between N106,000 and N135,000 from farming activities before benefiting from the ABP but after benefiting from the ABP, this dropped to 14 beneficiaries. Finally, 5 beneficiaries were earning ₦136,000 and above from farming activities, however, after the ABP, this increased to 10. These results suggest that, on the whole, benefiting from the ABP has not increased the income of the beneficiaries. This may be because there was no significant increase in their farm outputs. In order to find out if there was a significant difference in the income levels of the beneficiaries as a result of benefiting from the ABP, the t-test was employed.

The result of the t-test of the beneficiaries mean income is presented in table 7. The value of 1.062 obtained is not statistically different from zero which implies that benefiting from the ABP did not increase the beneficiaries' income.

Table 7. Paired T-test of the Mean Income Before and During the ABP

Mean farm output before the ABP	Mean farm output during the ABP	Paired t-test	Significance
₦55,205	₦62,155	1.062	0.2678

Source: Authors' computation.

6.7 Problems faced by beneficiaries in production

Given that the study has found that land cultivated has increased while farm output and income have not increased, it suggests that there are problems militating against the productivity of the beneficiaries of the ABP in the state. The problems affecting beneficiaries are presented in table 8.

Table 8. Problems Faced by Beneficiaries of the ABP

Nature of the Problem	Number of Beneficiaries	Percent
Late supply of inputs	298	59
Unproductive seedlings	179	35.45
Climatic conditions	28	5.54
Total	505*	100

*Respondents were allowed to give more than one problem.

Source: Field survey, 2019.

Table 8 shows the problems indicated by the respondents to have been responsible for low farm output after benefiting from the ABP in Benue State. The majority (59%) of the beneficiaries indicated that the farm inputs were not supplied to them on time and as such, this resulted in poor yields. Also, some of the beneficiaries (35.45%) indicated that the seedlings given to them did not germinate and those that germinated did not give good yield. Other beneficiaries (5.54%) indicated that the late supply of farm inputs that delayed timely planting was affected by drought (shortage of rain) which adversely affected the productivity of the crops. Thus, the non-increase in output and income may be attributed to these problems.

6.8 Assessment of poverty level among beneficiaries of the ABP

The FGT index and the logit regression model were utilized to assess the poverty level among beneficiaries of the ABP given their participation in the programme

during the 2017 farming season. The World Bank poverty line of US\$1.9 per day per person was employed. Given the official exchange rate of ₦305 per dollar, ₦579.5 was computed as the poverty line per day and ₦211,517.5 as poverty line per annum. Table 9 shows the FGT indices of the beneficiaries before and during the ABP.

Table 9. The FGT Index of Beneficiaries of the ABP

FGT Index	Before ABP	During ABP
P_0	0.61	0.57
P_1	0.39	0.32
P_2	0.27	0.24

Source: Authors' calculations.

Table 9 shows P_0 values of 0.61 and 0.57 which are the poverty head count ratios for before and during the ABP, respectively. These head count ratios suggest that 61% of the beneficiaries of the ABP were living below the poverty line of US\$1.9 per day before benefiting from the ABP and having benefited from the ABP, the figure dropped to 57%. This implies that benefiting from the ABP took only 4 percent of the beneficiaries out of poverty. This means that these beneficiaries could now have access to the basic necessities of life such as food, clothes, medication, and shelter.

The table also shows P_1 values of 0.39 and 0.32 for before the ABP and during the ABP, respectively. P_1 which is the poverty gap measures the mean distance of the income of poor households from the poverty line. Thus, the poverty gap values of 0.39 and 0.32 suggest that before benefiting from the ABP, 39% of the households' income levels were away from the poverty line. Having benefited from the ABP, this fell to 32%. The implication of this result is that the ABP has brought some beneficiaries' income levels closer to the poverty line than it was before the ABP.

Further, the table shows P_2 values of 0.27 and 0.24 for before and during the ABP respectively. The P_2 measures how severe the poverty situation is, thus the values suggest that before benefiting from the ABP, the severity of the poverty of the beneficiaries was 27% and having benefited from the ABP, the severity reduced to 24%. This implies that benefiting from the ABP has reduced the severity of poverty among the beneficiaries by 3 percent.

The beneficiaries were further classified into three poverty levels on the basis of their income before and during the ABP in relation to the World Bank's poverty line of US\$1.9 per day. Beneficiaries whose income fell below one-third of the annual poverty line of ₦70,505.83, i.e. 1/3(₦211,517.5) were considered core poor, while those whose income fell between 1/3 and 2/3 of the poverty line (i.e. ₦70,505.83 – ₦141,011.67) were considered moderately poor. Those whose income was greater than the 2/3 poverty line (i.e. ₦141,011.67) were considered non-poor. This was done in line with the study of Aye and Oji (2009). The classification is shown in table 10.

Table 10. Classification of Beneficiaries by Poverty Level

Poverty Level	Before ABP	During ABP
Core Poor	218 (58.13%)	198 (52.80%)
Moderately Poor	152 (40.53%)	168 (44.80%)
Non-Poor	5 (1.33%)	9 (2.40%)
Total	375 (100.00%)	375 (100.00%)

Source: Authors' calculations.

From table 10, it is evident that the majority of the sampled beneficiaries are core poor. Even though the percentage reduced by 5.33% with the introduction of the ABP, they still remained the majority. With the introduction of the ABP, about 4% of the sampled beneficiaries moved from the core poor status to moderately poor status. Again, the figures in the table suggest that with the ABP, only 1% of the sampled beneficiaries were lifted from moderately poor to non-poor status. The implication is that the ABP has not significantly impacted on the poverty levels of the beneficiaries in the Benue State. This may be partly attributed to the problems earlier identified.

To further investigate whether the ABP has the potential for poverty reduction among the beneficiaries, the logit regression model was estimated. The result of the logit regression model shows that the amount of loans from the ABP is inversely related to the poverty levels of the beneficiaries. This may be ascribed to the fact that an increase in the amount of credit collected by the farmers under the ABP has the probability of increasing the productivity of the farmers leading to an increase in the income levels and consequently

consumption levels of the farmers which will in turn lead to an increase in their standard of living.

Table 11. Logistic Regression Model Result

<i>pov</i>	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
<i>edu</i>	.2160231	.1492766	1.45	0.148	-.0765536	.5085998
<i>fexp</i>	.0392041	.0964151	0.41	0.684	-.149766	.2281743
<i>loan</i>	-6.403027	7.462307	-0.86	0.391	-2.102306	8.233407
<i>inabp</i>	1.693608	1.626808	1.05	0.295	-1.48e-08	4.87308
<i>cfarms</i>	-.0034194	.0529129	-0.06	0.948	-.100288	.107126
<i>intabp</i>	-.0126191	.0660607	-0.19	0.849	-.1420957	.1168576
<i>modep</i>	-.0299347	.0225824	-1.33	0.185	-.0741954	.014326
<i>_cons</i>	.7063963	.7316108	0.97	0.334	-.7275345	2.140327
<i>LR chi2(7)</i> = 6.80		<i>Prob > chi2</i> = 0.4505				
<i>Log likelihood</i> = -158.33631		<i>Pseudo R2</i> = 0.4210				

Source: Authors' estimations using STATA 13.

Also the result of the model has revealed that the change in farm sizes as a result of the ABP (*cfarm*) is inversely related to the poverty levels of the beneficiaries. This may be attributed to the fact that the supply of inputs under the ABP has the probability of increasing the amount of land cultivated by the beneficiaries and, all other things being equal, this will in turn increase the output and income levels of the beneficiaries; increased income of the beneficiaries presupposes an increase in consumption and standard of living.

Similarly, the interest rate charged on loans under the ABP (*intabp*) has a negative relationship with the poverty levels of the beneficiaries. This may be because the interest rate charged under the ABP is low and as such will not increase significantly the amount of loan that a beneficiary has to repay as loan services. This affords the beneficiaries the opportunity to use the proceeds from farming activities to enhance their consumption levels. Furthermore, the mode of payment of the ABP loans (*modep*) is reversely related to the poverty status of the beneficiaries. This may be because a convenient mode of payment under the ABP places the beneficiaries in a better position to repay the loan and they can also use the balance of the proceeds from the farming activities to augment

their income and thus increase their consumption levels leading to improvement in their welfare.

Though the coefficients are not statistically different from zero, the negative signs of the coefficients suggest a potential of the ABP for poverty reduction. The pseudo R^2 value of 0.4210 has shown that the model performs well in terms of explaining variations in the poverty levels of the beneficiaries, while the LR chi2 value of 6.80 is not statistically significant with a probability value of 0.4505. This has further confirmed that, although the explanatory variables in the model appeared with the right signs in most cases, they were not statistically significant.

The implication of these results is that the ABP has the potential for poverty reduction among the beneficiaries, however, the implementation challenges identified may have militated against the programme reducing poverty among the beneficiaries in Benue State as expected.

7. Conclusion and Policy Implications

Emergent from the findings of the study, the paper concludes that benefiting from the ABP has increased the beneficiaries' farm sizes, however, their farm output and incomes have not increased. Further investigation revealed that late supply of inputs, unproductive seedlings supplied and climatic conditions were responsible for poor yield, hence the non-increase in the income of beneficiaries. Given that the income of the beneficiaries did not increase, it was concluded that the programme has not reduced poverty in the Benue State. This is so because the findings show that only 4% of the beneficiaries were lifted from core poor status to moderately poor status and only 1% of the beneficiaries were lifted from the moderately poor status to non-poor status as a result of benefiting from the ABP in the state.

However, from the findings, it is indicated from the logit regression model that the ABP has the likelihood of poverty reduction among the beneficiaries if implementation challenges are tackled. This suggests that proper implementation of the ABP will have positive impact on the Economic Recovery and Growth Plan (ERGP) of the Federal Government in terms of providing employment and reducing poverty as well as increasing agricultural output for domestic consumption and exports, thereby reducing the total dependency of the economy on oil. This will help to achieve the ERGP cardinal objectives.

Thus, to achieve this, this paper recommends that the implementation strategy of the ABP in Nigeria in general, and Benue State in particular, be changed to ensure timely supply of farm inputs. Also, proper monitoring of the farming activities of the beneficiaries should be vigorously pursued by the agricultural extension workers to ensure that beneficiaries strictly comply with the best farming practices for enhanced productivity.

In addition, given that crop losses were also due to flood and drought, the agricultural insurance policy under the ABP as a risk mitigating measure should be invoked in order to compensate affected beneficiaries in the state. Again, findings showed that poor quality/fake inputs led to low yield. In this regard, the Project Management Team (PMT) of the ABP should only contact agro dealers who have genuine inputs and hybrid seedlings that can enhance the productivity of the beneficiaries.

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