EFFECTS OF ANCHOR BORROWERS PROGRAMME (ABP) CREDIT ON THE PRODUCTIVITY OF BENEFICIARY RICE FARMERS IN KEBBI STATE, NIGERIA

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ABSTRACT

The study examined the effects of Anchor Borrowers' Programme (ABP) on the productivity of rice farmers in Kebbi State, Nigeria. A multi-stage sampling technique was used to collect data from 221 ABP rice farmers with the aid of structured questionnaire which were analyzed, using descriptive statistics, Total Factor Productivity (TFP) and Ordinary Least Square (OLS) regression. The results obtained showed that the average age of the respondents determined was 46years, out of which 69.27% of them were male and 93.21 % married. Majority of the respondents' primary occupation is farming with an average farming experiences and household size of 20years and 14 persons respectively. The mean productivity index of the ABP rice farmers estimated was 6.24 with the minimum and maximum values of 1.89 and 14.45 respectively. The result on OLS regression which found that ABP credit was statistically significant at 1% level of significance has a positive effect on the productivity of the rice farmers. Lack of awareness, bureaucratic bottlenecks and high interest rate are found to be severe constraints limiting small scale rice farmers' access to ABP credit. The study however recommended that there is need for rice farmers to be sensitize for effective participation about ABP by Government. There is also need for the Government to constitute monitoring and evaluation committee that will oversee the implementation of the programme according to blue its print.

Key words: Anchor Borrowers; Programme; Productivity; Rice farmers; Kebbi State

INTRODUCTION

According to Food and Agricultural Organization Statistics (FAOSTAT, 2017), rice is a staple food for about 2.6 billion world's population. Meaning it is the most important staple food for a large number of the world human population. It is the second highest crop produce worldwide after maize. Unlike maize crop which is grown for other purposes than human consumption, rice is said to be the most important grain with regard to human nutrition and calorie intake (Usman, 2017). In 2008, Nigeria produced approximately 2million metric tonnes of milled rice and imported roughly 3million metric tonnes, including an estimated 800,000metric tonnes that is suspected to enter the country illegally on an annual basis (National Bureau of Statistics NBS, 2017).

PwC Analysis (2017) and FAO (2021) revealed that domestic production of rice in Nigeria has never been able to meet with domestic demand thereby leading to considerable imports which as at the year 2021 stood at 5.0 metric tonnes with domestic consumption estimated to be 7.0 metric tonnes leaving a huge gap of 2.0 metric tonnes. In 2015, the Central Bank of Nigeria stressed that this situation has continued to encourage dependence on importation. Meanwhile, several studies in the past have examined the impact of agricultural finance on agricultural productivity like Javed *et al.* (2016) who investigated the impact of Central Bank of Nigeria's development finance role on economic growth and development of Nigeria; Chauke *et al.* (2014)examined the impact of agricultural credit facility in agricultural production and rural development; Nwankwo (2013) carried out an empirical study on the impact of agricultural co-operative and rural development bank between 1990 and 2010 on agricultural productivity in Nigeria and Duy (2012) that studied the role of access to credit in rice production efficiency of rural households in the Mekong Delta.

Since the rice import is paid in foreign currency, this has led to the precarious balance of payment position of the country. To curb the challenge of rice production and reduce importation of rice, Federal Government of Nigeria on 27th November 2015 launched Anchor Borrower Programme aimed at diversifying economy towards agricultural sector of the economy, driven by small scale farmers to boost local production of rice, maize, wheat and cassava in the country. Though study on effects of anchor

borrower programme on the productivity of rice farmers has not been well established, it was evolved from consultations with stakeholders comprising Federal Ministry of Agriculture and Rural Development, State Governors, millers of agricultural produce, and smallholder farmers to boost agricultural production and non-oil exports in the face of unpredictable crude oil prices and its resultant effect on the revenue profile of Nigeria (CBN, 2016).

Despite the prospects that greeted the launch of the ABP, with the hope that the program targets to alleviate poverty, enhance food security and increase income by enhancing the productivity of the beneficiary farmers, the performance of the Nigerian rice sub-sector are at low level (Osanyinlusi and Adenegan, 2016). The program thrust of the ABP is strictly provision of credit in kind and cash for small holder farmers (SHF) to boost production of these aforementioned commodities, stabilize inputs supply to agro-processors and address the country's negative balance of payments on food. But right from inception, it was hijacked by politicians and some highly placed government officials (CBN, 2016). Based on the programme guidelines, the SHF is supposed to supply his/her produce to the agro-processor (Anchor) at harvest, who will then pay the cash equivalent to the farmer's account. Unfortunately, the present happens does not go in accordance with the plans, thus leading to the persistent rice crises. This research therefore intends to uncover the factors limiting the small holder rice farmers access to this ABP credits.

Theory of production in agriculture

Production is a process in which inputs or resources are transformed into products or outputs. Durba (2017) also defined production as a process by which variable inputs and fixed factors are combined to produce output. In agriculture, the production inputs employed traditionally are land, labour, capital, management, and of recent, water resources. These resources can be coordinated into a farm-firm or a producing unit whose goal might be to maximize profit, maximize output, minimize cost, maximize utility, or a combination of all these motives of enterprise (Nwojo, 2017).

In any production process, these resources are channeled into the farm with the aim of achieving maximum output at a minimum cost or to maximize profit. The plain jostle of economics of agriculture production at the micro level, is to assist a single farmer or a group of farmers in achieving specified goals through efficient intra-farm resource allocation over a period of time. These resources are allocated as input mix which are managed to produce a specific level of output of the undertaken enterprise. Since there are alternative means of attaining the production goals or objectives, the theory of production offers a theoretical and empirical basis for making proper decisions among alternatives in order to achieve some combination of the farmer's goals. Economics of agricultural production is achieved either by measuring output from limited resources or reducing the quantity of resources required to produce a given level of output as posited by Olayide and Heady (1982) in Oni *et al.* (2009).

Conceptual framework of the study

Agricultural productivity of a production unit is defined as the ratio of its output to its input. The ABP is a development intervention with the broad objective to create economic linkages between smallholder rice farmers and reputable large-scale processor with a view to increasing agricultural output which will go a long way to increase productivity and food security. Conceptual frameworks connect all aspects of inquiry for this research (e.g., problem definition, purpose, literature review, methodology, data collection and analysis) and also provide the structure/content for the whole study based on literature and personal experience. In this study it shows relationship that existing among variables, thus represent a figurative expression of relationships between dependent and independent variables in this study. These relationships are depicted schematically as shown below. The framework in figure 2 is based on the premise that productivity (Dependent variable) of the ABP credit to rice farmers could be influence by the socio-economic characteristics and institutional (independent variables) as well as the intervening variables such as government policies, nature of agricultural technologies and extension services among others, leading to an impact on productivity.

Independent Variables		Dependent Variables

Socio-economic charateritics
1. Age
2. Sex
3. Education
4. Marital status
5. Household size
6. Farming experience
7. Primary occupation
8. Income

Institutional factors
1. Land ownership
2. Access to credit
3. Extension contacts
4. Membership of cooperative society

Factors that influence farmers' production
1. Land
2. Labour
3. Improved seed
4. Fertilizer
5. Agrochemicals
6. Capital

Constraints to access to agricultural credit
1. Lack of awareness on loan procedures
2. Bureaucratic bottleneck (delays in loan processing)
3. High interest rates

Intervening Variables
1. Institutional bureaucracy
2. Farmer's attitude
3. Cultural belief
4. Climatic factors
5. Government policy

Crop productivity

Expected outcome
1. Increased output
2. Improved productivity
3. Increased income generation
4. Increased food security
5. Reduced poverty
6. Improved standard of living
7. Improved socio-economic status
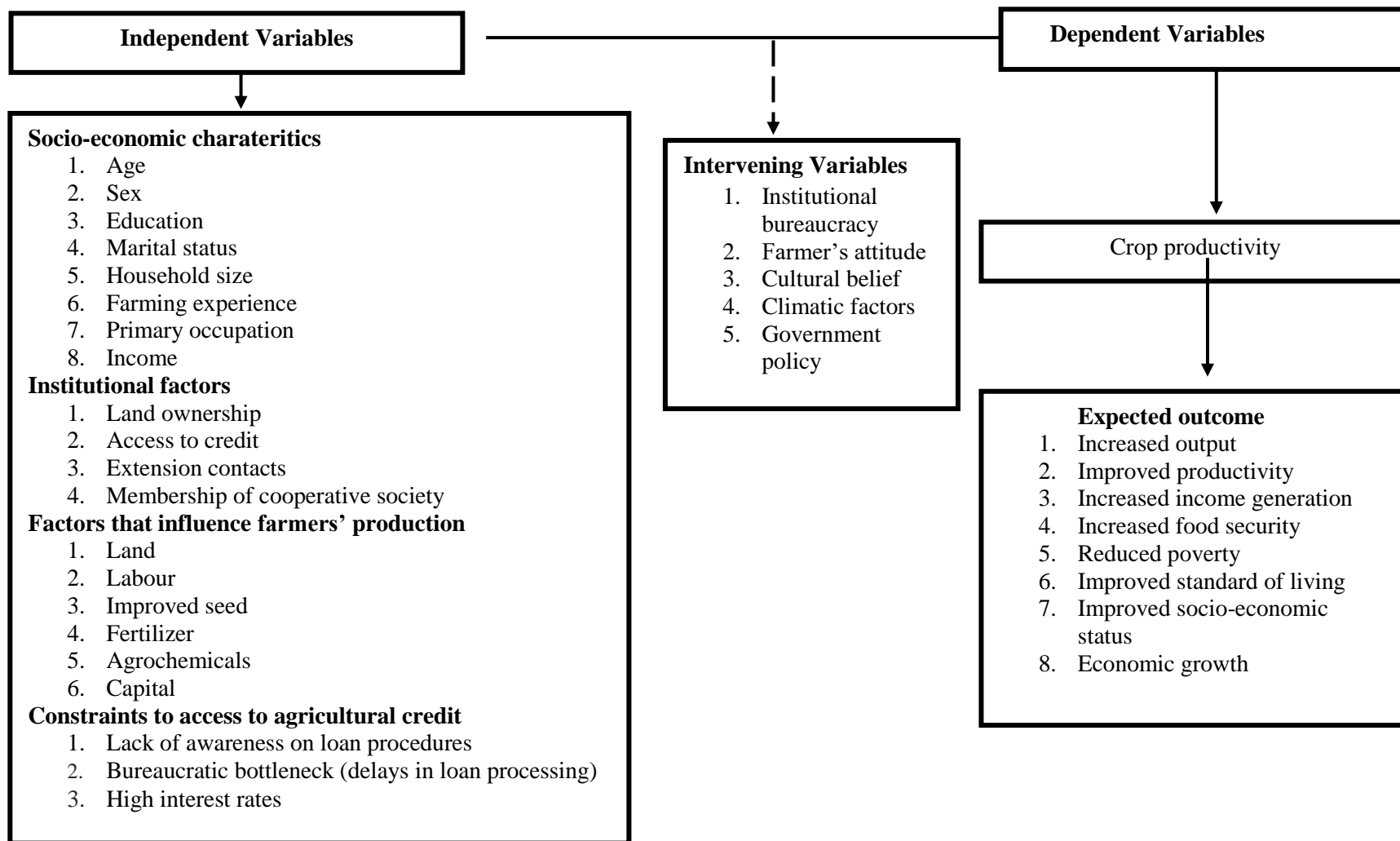8. Economic growth

Figure 1: Conceptual framework of effect of Anchor Borrowers Programme (ABP) credit on productivity of beneficiary rice farmers in Kebbi State, Nigeria.

METHODOLOGY
This study was carried out in selected local Government Areas in Kebbi State, Nigeria as presented in Figure 1: The State is located in North-West geopolitical zone of Nigeria. The State lies between Latitude10^0 8′ and 13^0 15′ North of the equator and Longitude $3^0$30′ and $6^0$02′ East of the Greenwich Meridian. However, with population growth rate of 2.8% in Nigeria (World Bank, 2019), the population of the State was projected to be 4,440,000 as at 2020.Kebbi State covers a total of 36,800sqkm land area and enjoys a tropical continental type of climate and this is largely controlled by two air masses, namely tropical maritime and tropical continental, blowing from the Atlantic and the Sahara Desert respectively. These air masses determine the two dominant seasons wet and dry. The wet season lasts from April to October in the South and May to September in the North; while the dry season lasts for the remaining period of the year Mean annual rainfall is about 800mm in the North and 1000mm in the South. Temperature is generally high with mean annual temperature of about 26°C. However, during the harmattan season (December to February) the temperature can go down to about 21°C and up to 40°C during the months of April to June. The major economic activity is agriculture (farming, fishing and livestock rearing).The state is endowed with rich tourist attraction such as Argungu International fishing festival, Uhola festival and Kanta Museum among others (World Bank, 2019).
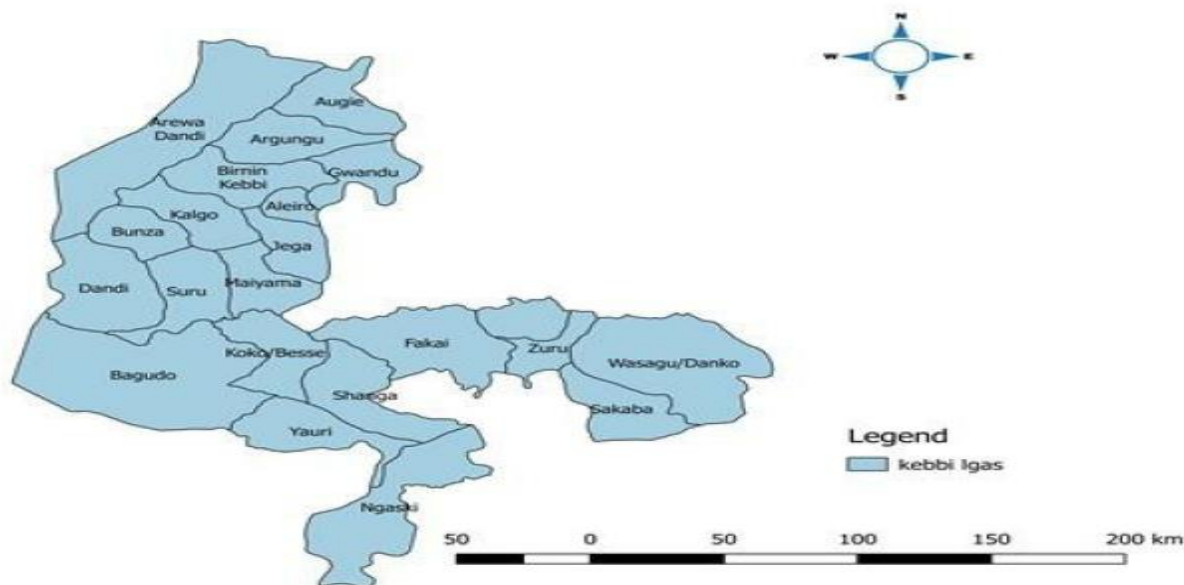

Fig. 1: Map of Kebbi State Showing its Local Government Areas

Sampling Procedure and Sample Size
Multi-stage sampling procedure was used in sampling the respondents for the study. The study was conducted in Kebbi State being the ABP was first lunched in the state. In the first stage, two (2) Local Government Areas (LGAs) were purposively selected based on a priori information of their high involvement on the ABP credit in the State. The Second stage involved random selection of three (3) villages in each Local Government Areas (LGAs) giving a total six villages. In third stage of sampling, Taro Yamane (1976) formula was employed to obtained 221 ABP rice farmers for the study. Table 1 showed sampling frame and sample size obtained using equation 1:

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

Where, n is sample size, N is finite population, e is the limit of tolerable error and 1 is unit.

Table. 1: Sampling Procedure and Sample Size

State	LGAs	Villages	Sampling Frame	Sample size
		ABP BENEFICIARIES		
Kebbi	Argungu	Gulma	185	38
		Sarwa	211	43
		Tungar zazzagawa	208	43
	Bagudu	Tuga	128	26
		Kwalla	178	37
		Lolo	163	34
TOTAL		06	1074	221

Source Field Survey, 2019

Method of Data Collection

Data for the study were collected from primary source with the aid of structured questionnaire. information on socio-economic profile of respondents, their rice productivity, determinant factors affecting ABP rice farmers on productivity and constraints faced by small-scale rice farmers in accessing ABP in the study area.

Method of Data Analysis

Data collected were analyzed using descriptive statistics, Total Factor Productivity index (TFP) and Ordinary Least Square (OLS) regression model. Total Factor Productivity index as used by Syverson (2011). Computed using software programming package and expressed in equation (2):

$$TFP_t = A_t$$
$$= {Y_t}/{K_t \alpha K L_t \alpha I M_t}$$

Where;

TFP=Total Factor Productivity,

A_t =factor neutral shifter, (TFP in this framework),

Y_t=total Annual Output (measured in terms of real revenue from annual sales),

K_t= Capital inputs, (Naira) such as Tractors, sickle, sack, knapsack sprayers and basin used,

M_t=Total Material inputs, Agro products used (measured in terms of total expenditure on input less labour and capital inputs),

L_t= Labour input (measured in terms of total wages for hired labour)

The Ordinary Least Square (OLS) regression model was used to achieve the determinant factors affecting the productivity of ABP rice farmers is specified explicitly as in equations (3):with the a priori expectation sign.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \cdots + \beta_{14} X_{14} + e \quad 3$$

Where;

Y = Rice productivity [Total Factor Productivity (TFP) index]

X_1=ABP credit accessed (Naira) $(\pm)$

X_2 = Labour (man-day) (+)

X_3 = Fertilizer (kg) (+)

X_4 =Improved seed (kg) (+)

X_5 = Farm size (hectare) (+)

X_6 = Gender (Dummy: 1 for male, 0 for female (+)

$X_{7)}$= Level of formal Education (years of schooling) (+)

X_8=Age (years) (+)

X_9=Member of cooperative society (0 for non-members, 1 for members) (+)

X_{10}=Contact with extension agents (1 for contact, 0 for non-contact) (+)

X_{11}= Household size (number) (+)

X_{12} = Farm experience (years) (+)

X_{13}= Land ownership (1 for owner, and 0 is for otherwise) (+)

X_{14}= Marital status (Married 1, otherwise= 0) (+)

e= Error term.

β_0= Coefficient of intercept

$\beta_1 - \beta_{14}$ = Coefficients of independent variables

RESULTS AND DISCUSSION

Socio-Economic Characteristics of the Respondents

The results on the socio-economic characteristics of the respondents as presented in Table 2 showed that the mean age of respondents in Kebbi State was 46 years, implying that they were still in their active and productive age thus could strive to access additional funds that will enhance their production. This agrees with the study of Ayinde *et al.* (2017) who revealed that majority of rice farmers that benefited in Federal Government Intervention in Kwara State, Nigeria were in their productive age. Also, majority (69.27%) of the respondents were

males, while 93.21% were married. These findings showed that majority of respondents in the study area were males and married. Married men and women have more responsibilities that could make them seek for additional fund to boost rice production. This finding is in agreement with that of Olughu (2019) who reported that larger proportion of respondents that benefited from ABP in Kaduna State were males. Also, Nwalieji (2016) reported that larger percentages of Nigeria farmers are married.

As revealed in Table 1, majority (79.19%) of the respondents acquired formal education, implying that most of the ABP rice farmers are literate and knowledgeable which could serve as opportunity for them to enhance their income and livelihood. This finding agrees with the work of Ayinde *et al.* (2017) who posited that access to formal education had the tendency of improving the livelihood of rural farmers in Kwara State. Also, majority (72.85%) of respondents in the study area were full term farmers, implying that farming is their major occupation for income generation. This finding is in line with the work of Baiphethi and Jacobs (2015) who reported that occupation whether primary or secondary enable farmers to diversify their sources of income in order to manage risk. However, mean farming

Factors influencing the Productivity of ABP Respondents
The result of the OLS regression estimates on the factors influencing productivity ABP rice farmers in the study area is presented in Table 4. The Exponential function was the lead and chosen equation based of the F-value, R-square value and the number of significant variables. The result revealed F-statistic value of 3.37 which is statistically significant at 1% level of probability, implying significant relationship between the dependent variable and independent variables included in the models. It also shows coefficients of determination (R-squared) value of 0.1863 which implies that only about 19% of the variations in the rice productivity of the respondents were explained by the explanatory variables included in the model.

The coefficient of ABP credit (1.30e-06) was positive and significant at 1% level of significance.

experience of the respondents was 20 years which shows that respondents in the study area had long years of experience in rice farming and this is expected to positively influence their productivity and accessibility to fund from ABP. This result is in line with the work of Nwalieji (2016) who found out that the average rice farming experience of farmers was 25 years in Anambra State, Nigeria.

Rice Productivity of the Respondents
The results in Table 3 shows the mean rice productivity index of the ABP beneficiary rice farmers in the study area estimated to be 6.24 with the minimum and maximum values of 1.89 and 14.45 respectively. This means that the value of the rice farmers' output was at least 6 times greater than the value of inputs employed. In order words, on the average, every ₦1 incurred on inputs (labour, capital and other materials such as seed and agrochemicals) by the rice farmers yielded ₦6.24 in their output. This implies that the ABP beneficiary rice farmers in the study area were productive given that the mean rice productivity values obtained was found to be high (i.e., TFP index is greater than one). This result is in line with the study of Mohammed (2017) who reported a TFP index of 6.02 for each farmer in Nigeria.

This implies that the rice farmers' productivity will increase with an increase in the amount of ABP credit obtained. This further implies that ABP credit had positive and significant effect on the productivity of respondents in the study area. This finding is in agreement with that of Gona *et al.* (2019) who reported that ABP had improved the technical efficiency of rice farmers in Kebbi State. More so, the results revealed that coefficient of farm size(5.0180, $p<0.05$), seed (0.2063, $p<0.01$), education (0.2282, $p<0.01$), age (0.0109, $p<0.05$), extension services (0.1562, $p<0.10$) and marital status (-0.2640, $p<0.05$) level of significance, respectively were significant and statistically influences the rice productivity value of the respondents. This study corroborates with the findings of Mohammed (2017) who noted that education, extension services and marital status have significant influence on the productivity of farmers in Northern Nigeria.

Table 2: Distribution of respondents according to socio-economic characteristics (n = 221)

Variables	Frequency	Percentages
Age (years)		
21 – 30	7	3.17
31 – 40	52	23.53
41 – 50	116	52.49
51 – 60	32	14.48
>60	14	6.34
Mean	**46**	
Gender		
Male	204	92.31
Female	17	7.69
Marital status		
Single	4	1.81
Married	206	93.21
Divorced	11	4.98
Level of education		
FSLC	83	37.56
HND	3	1.36
JSCE	20	9.05
NCE	18	8.14
OND	11	4.98
Qur'anic	46	20.81
SSCE	31	14.03
University Degree	9	4.07
Occupation		
Agro processing	21	9.50
Artisan	5	2.26
Civil servant	11	4.98
Farming	161	72.85
Fisheries production	15	6.79
Livestock production	7	3.17
Trading	1	0.45
Farming experience (years)		
1 – 10	22	9.95
11 – 20	137	61.99
21 – 30	59	26.70
>30	3	1.36
Mean	**20**	

Source: Field Survey, 2019

Table 3: Respondents' rice productivity indices (n = 221)

Statistics	Total Factor Productivity Index
Mean	6.24
Standard Deviation	3.80
Minimum	1.89
Maximum	14.45

Source: Computed from Field Survey Data, 2019

Table 4: OLS regression estimates on factors influencing productivity of the ABP respondents

Variables	Coefficient	Standard error	t-value
ABP credit	1.30E-06	4.74E-07	2.73***
Farm size	5.018	1.9846	2.53**
Labour	-0.0054	0.0052	-1.04
Fertilizer	-0.0009	0.0016	-0.58
Seed	0.2063	0.0795	2.60***
Gender	-0.1184	0.1416	-0.84
Education	0.2282	0.0799	2.86***
Age	0.0109	0.0045	2.43**
Cooperative membership	-0.1442	0.0888	-1.62
Extension services	0.1562	0.0851	1.84*
Household size	-0.0075	0.0059	-1.27
Farm experience	-0.0032	0.0054	-0.59
Land ownership	-0.0078	0.0833	-0.09
Marital status	-0.264	0.1245	-2.12**
Constant	0.6861	0.3929	1.75*
Diagnostic statistics			
R-Squared	0.1863		
F-value	3.37***		

Source: Field Survey, 2019
Note: *, ** and * implies 1%, 5% and 10% levels of significance respectively.**

Constraints Limiting Access to ABP by the Respondents

As revealed in Table 5 lack of awareness on procedures of loan application (66.06%) ranked 1st among the constraints limiting the respondents' access to the ABP, followed by Bureaucratic bottlenecks in processing the loan (61.99%) and high interest rate charge by the bank (58.82%) ranked 2nd and 3rd, respectively. This finding agrees with the work of Olughu (2019) who reported that lack of awareness of procedures and high interest rates were the major constraints faced by ABP beneficiaries in Kaduna State. Also ,unavailability of the bank in farmers 'location (47.06%), literacy requirement in banking transaction (39.82%), collateral requirements (37.10%) and untimely disbursement (33.03%) ranked 4th, 5th, 6th and 7th, respectively were other constraints limiting the respondents' access to the ABP in the study area. However, the least constraints indicated by the respondents were lack of insurance by farmers (20.81%) and unfriendly nature of bank staff (15.84%) ranked 8th and 9th, respectively. This finding agrees with the work of Ayinde et al. (2017) who reported that collateral requirements, unavailability of bank in farmers' community and untimely disbursement were the major constraints faced by rice farmers in Kwara State, Nigeria.

Table 5: Distribution of respondents based on constraints limiting access toABP (n = 221)

Constraints	Frequency	Percentage	Rank
Lack of awareness of the procedure of loan application	146	66.06	1st
Bureaucratic bottleneck (delays in processing the loan)	137	61.99	2nd
High interest rate charge by the bank	130	58.82	3rd
Unavailability of the bank in my location	104	47.06	4th
Literacy requirement in banking transaction	88	39.82	5th
Collateral requirement	82	37.10	6th
Untimely disbursement	73	33.03	7th
Lack of insurance by farmers	46	20.81	8th
Unfriendly nature of bank staff	35	15.84	9th

Source: Field Survey, 2019

CONCLUSION AND RECOMMENDATIONS

The study concluded that Anchor Borrowers Programme (ABP) credit has significant effect on productivity of the beneficiary rice farmers in the study area, nonetheless lack of awareness of the procedure of loan application, bureaucratic bottleneck and high interest rate charge by banks were the major constraints faced by small-scale rice farmers in accessing ABP credit. The study however recommended that there is need for rice farmers to be sensitize for effective participation about ABP by Government. The is need also for the Government to constitutes monitoring and evaluation committee that will oversee the implementation of programme according to blue print in order to reduce corruption tendencies and for effective execution of the programme.

REFERENCES

Ayinde, O., E,. Fatigun, K., Ogunbiyi, K., Ayinde, K., & Ambali, Y., O. (2018). Assessment of Central Bank Intervention on Rice Production in Kwara State: A Case-study of Anchor Borrower's Program, Kwara State, Nigeria. A Conference Paper of the International Association of Agricultural Economists held at Vancouver, British Columbia on July 28 – August 2, 2018. Available online at https//ideas.repec.org.

Baiphethi, M. N. & Jacobs, P. T. (2015). The Contribution of Subsistence Farming to Food Security in South Africa, *Agrekon,* 48(4), 459-482

Chauke, P.K., Anim, F., D., K., Pfumayaramba, T., K., & Nekhavhambe, T. D. (2014). An Assessment of Factors Affecting Income Generation from Crop Production Under Irrigation in the Limpopo Province of South Africa. *Journal of Human Ecology*, 45 (1), 1 – 6.

Central Bank of Nigeria (CBN) (2016). Anchor Borrower Programme Guidelines. Development Finance Office Department, Central Bank of Nigeria, Abuja.

Duy, V., Q. (2012). The Role of Access to Credit in Rice Production Efficiency of Rural Households in the Mekong Delta, Vietnam. CAS Discussion Paper 84.

Food and Agriculture Organization Statistics (FAOSTAT) (2017). Statistical Database of Food and Agriculture Organization of the United Nations, FAO, Rome, Italy. Available at http://faostat.org/faostat/and accessed on April 27, 2019.

Gona, A., Mahmud, A,. & Maikasuwa, M., A. (2020). Effect of Anchor Borrowers Programme (ABP) on Technical Efficiency of Beneficiary Rice Farmers in Kebbi State, Nigeria. *International Journal of Agricultural Economics,* 5(4), 106 – 113.

Javed, M.,S,. Hassan, S., Adil, S.,A., Ahmad, A., S., Chattah, M.W. A. & Nawaz, Z. (2016). Impact assessment of micro-credit programme of PRSP on crop productivity. *Pakistan Journal of Agricultural Sci*ence, 43(34), 209 – 212.

Mohammad, A., U. (2017). Effect of insurgency on food crops farmers' productivity in North East Nigeria. Unpublished MTech Thesis, Department of Agricultural Economics and

Extension Technology, Federal University of Technology, Minna Nigeria.

National Bureau of Statistics (NBS) (2017). Gross Domestic Product Economic Statistics. Retrieved on January 28, 2019 from www.nigeriastat.gov.ng.

National Population Commission (NPC) (2006). Year Book on Nigerian Population Data. National Population Commission, Nigeria. Report. Retrieved on February 2nd 2019 from- *http://www.jstor.org*.

Nwalieji, H. U. (2016). Comparative Profit Analysis of Rice Production Enterprise among Farmers in Anambra and Ebonyi States, Nigeria. *Asian Journal of Agricultural Extension, Economics and Sociology,* 8 (3), 1 – 11.

Nwankwo, I. N. Agwu, N.M. Eze, C. I. Mbanasor,J.A., Onyenweaku,C. E. and Kamalu,C.E. (2013).Evaluation of Second National Fadama Development Project in Nigeria: A Rapid Policy Appraisal.

Nwojo, M. I. (2017). Gender differentials in production efficiency among small-scale cassava farmers in Abia State, Nigeria Unpublished MTech thesis, Department of Agricultural Economics and Extension Technology Federal University of Technology, Minna, Nigeria, 86p.

Olayide, S. O., & Heady, E. O. (1982). *Introduction to Agricultural Production Economics.* Ibadan University press Publishing House, University of Ibadan, Nigeria 319p.

Olughu, K.C. (2019). Effect of Anchor Borrowers Programme on the Livelihood of Smallholder Rice Farmers in Kaduna State, Nigeria. An Unpublished MTech Thesis Submitted to the Department of Agricultural Extension and Rural Development, Federal University of Technology, Minna. Pp 1 – 83.

Oni, O. A., Nkonya, E., Pender, J., Phillips, D. and Kato, E. (2009). Analyzing Drivers of Food Crop Productivity in Nigeria. *Journal of Economics and Rural Development,* 18(1), 36-45.

Osanyinlusi, O. I. and Adenegan, K. O. (2016). The Determinants of Rice Farmers' Productivity in Ekiti State, Nigeria. *Greener Journal of Agricultural Sciences*, 6 (2), 49 – 58.

Price Water House Coopers Analysis (PwC) (2017). *Boosting Rice Production through Increased Mechanization.* Price water-house Coopers Limited, Nigeria, Pp 20.

Syverson, C. (2011). Creating an index to measure total factor productivity: Identifying the component and determinants and test usefulness. Huller school for social political, Brandeis University. Available online at https∕∕home.uchicago.edu.

Usman, A. (2017). Analysis of Technical Efficiency and Its Determinants among Small Scale Rice Farmers in Niger State. Unpublished MSc .Dissertation. Department of Agricultural Economics and Rural Sociology, Ahmadu Bello University, Zaria, Nigeria.

World Bank, (2019). Nigeria Population Growth Rate. Accessed on 24th May 2019.From ttps∕∕data.worldbank.org.

Yamane, T. (1976).Research Methodology. Available online at https∕∕wwwscrip.org(s(125m