



EFFECTS OF ANCHOR BORROWERS' PROGRAMME ON LIVELIHOOD OF  
SMALLHOL DER WHEAT FARMERS IN ZAMFARA  
STATE, NIGERIA

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ABSTRACT

The study assessed the effects of Anchor Borrowers' Programme (ABP) on livelihood of smallholder wheat farmers in Zamfara State, Nigeria. A multi stage sampling procedure was used to select 182 beneficiaries and 182 non-beneficiaries of ABP. Data were collected using structured questionnaire and analysed using Propensity score matching (PSM). The result of Radius matching shows that ABP had a significant effect ( $P < 0.01$ ) on the yield of smallholder wheat farmers who were beneficiaries of the programme with a difference of 873.598 kg/ha of wheat against the non-beneficiaries of ABP in the study area. Similarly, the result of using Radius matching revealed a difference of ₦165, 060:00 in income, significant at 1%, and the result of Radius matching revealed a significant ( $P < 0.001$ ) increase in assets accumulation (level of living) of about ₦527, 275:00 between the beneficiaries and non-beneficiaries of ABP. It can be concluded from the results that ABP had positive effect on the yield, income and level of living (livelihood) of beneficiaries of the programme. It was therefore recommended that the ABP or similar program be replicated in other communities by government, NGOs or private.

**Keywords:** Borrowers, Effects, Livelihood, Programme and Wheat

INTRODUCTION

Agriculture has remained the major source of livelihood of Nigerians. It is one of the leading and most important component which currently contributes to the Gross Domestic Product (GDP) to the tune of 42% (First Security Discount House (FSDH), 2017). Nigerian population estimated at 216.8m people (National Bureau of Statistics (NBS), (2022) is said to have about 35 per cent of its population engaged in agriculture and agriculture employs about 70 percent of the active labour force, as well as the supply of food and raw materials for the country industry (Matemilola & Elegbede, 2017; Barnabas & Kamala, 2017; World Bank, 2023). Thus, majority of the population depend largely on agriculture for their livelihood.

A livelihood is a means of making a living (Khan *et al.*, 2020). It comprises the capabilities, assets, income and activities required to secure the necessities of life through interaction in the socio-cultural environment and the vulnerability context. This is to achieve better standard of living and encapsulates the social and family support mechanisms where people rely on for a living and protection during crisis period (Muhyie *et al.*, 2025). Rural livelihood is about the means, strategies and activities for securing basic necessities in terms of food, water, shelter, medication as well as the network of social combinations that enhance the lives of the rural dwellers (Onyekwere and Nworgu, 2020). Livelihood is a multi-dimensional phenomenon that cut across agricultural and non-agricultural sources of making a living. However, smallholder farmers reside in the rural areas and source their means of livelihood through agriculture, particularly in developing nations (World Bank, 2023). Therefore, achieving a sustainable rural livelihood is central to all human development and economic growth (Barad *et al.*, 2020). The rural smallholder



farmers source and depends largely on agricultural production, and any changes in production through agricultural or rural development programs such as the Anchor Borrowers' Programme would impact on their livelihood. As a way of making a living smallholder farmers in their large numbers engage in wheat farming across Nigeria.

Wheat (*Triticum aestivum*) in Nigeria, is the third most consumed grain after corn and rice. The country's population growth rises wheat consumption, which was expected to increase from 8.08 million tons in 2021 to 10 million tons by 2030 (Abah *et al.*, 2023). The country is projected to increase production from 40,000 tons in 2021 to 95,000 tons in 2030, while the supply- demand gap was projected to increase from 7.86 million in 2021, to 9.63 million tons 2031 (Abah *et al.*, 2023), causing it to expend over \$2billion annually, (World Grain, 2022; Central Bank of Nigeria CBN, 2021; Ekot, 2021). The average wheat production in Nigeria of 1.13t/ha is a pointer to the need for an aggressive wheat production initiative, if the country is to achieve self-sufficiency in wheat production to meet the ever-increasing need for wheat and allied products.

In Zamfara State, agriculture thrives well, employing more than 80% of the population, earning its official slogan "Farming is Our Pride". Zamfara State is among the states in Nigeria with high potential for wheat production, though the state accounted for the least with 192 hectares (1.62%) of land put to wheat cultivation and lowest production of 672,000kg even though it has a high per hectare yield of 3,500kg in a survey of 13 northern states that produce wheat in Nigeria covering 2020/2021 farming season (NBS, 2021). The state is enmeshed in security challenges over the years which has continued to pose serious threat to smallholder wheat farmers' means of making a living. In order to curb the food production deficit due to increasing population and the need to reduce the effects of insecurity and improve the wellbeing of the populace, hence the need for wheat production initiative in the state.

The ABP was established by the Central Bank of Nigeria (CBN) in line with its developmental function as enshrined in the CBN Act 2007. The Programme was launched by President Muhammadu Buhari (GCFR) on November 17<sup>th</sup>, 2015 to boost local production of some agricultural commodities notably rice and wheat, two of the four products that dominate the country's food import bill (Chioma, 2016). This is in line with the key strategic plans of economic diversification, self-sufficiency in food production, stoppage of unbridled expenditure of foreign exchange and the 40billion naira rice and wheat farming under the CBN's ABP (CBN, 2016). The programme seeks to achieve objectives such as increase banks financing to improve agricultural productivity by creating an ecosystem that drives value chain financing; reduce the nations' food import bill through import substitution and enhance domestic value addition; create a new generation of farmers through innovative financing to support smart agriculture; and deepen financial inclusion, reduce poverty level among smallholder farmers and grow smallholder farmers from subsistence to commercial farming (CBN, 2021).

## **MATERIALS AND METHODS**

### **The Study Area**

The study was carried out in Zamfara State. The state is located in the north western part of Nigeria with Gusau as its state capital. Not until 1996, the area was part of the old Sokoto State. The state is located between latitude latitudes 10°50<sup>1</sup> N and 13°38<sup>1</sup> N and longitude 4°16<sup>1</sup> E and 7°13<sup>1</sup> E. According to the NBS, (2022) report, Zamfara State covers an area of 39,762km<sup>2</sup> (15,352sqm) and the state has a population of 3,278,873 (National Population Commission (NPC,



2006). The projected population for 2022 was estimated at 5,833,500 million with an annual growth rate of 3.7% and the state is 15<sup>th</sup> of 36 states in Nigeria.

Zamfara State shares borders with the Niger Republic and interstate boundaries with Katsina, Sokoto, Kebbi and Niger States. Zamfara State has 14 local government areas and four agricultural zones across three Senatorial Zones. The climatic condition of Zamfara is tropical in nature, with temperature of between 30<sup>0</sup>-35<sup>0</sup> C exhibiting features of Sahel, Arid and Guinea Savannas ecosystems (Chukwuji *et al.*, 2019). Zamfara's major crops are millet, guinea corn, maize, rice, wheat, soya bean, groundnut, cotton, tobacco and beans. Also, livestock such as sheep, goat, cattle and poultry are kept for households and commercial purposes (Chukwuji *et al.*, 2019; Zamfara State Ministry of Agriculture and Natural Resources, (MANR), 2022).

### **Sampling Techniques**

The study population was drawn from wheat farmers in the study area. To select the population for the study, a multi stage sampling procedure was employed to select the sample size. The first stage involved purposive selection of three zones of Gusau, Gummi and Talata Mafara out of the four zones in the state. These zones were selected because they constitute the zones from which wheat farmers participated in the ABP. The second stage involved a purposive sampling of five Local Government Areas (LGAs) of Gusau, Gummi, Talata Mafara, Bakura and Maradun. The choice of these LGAs was based on the fact that they are among the wheat producing areas in Zamfara state and the only LGAs that participated in the wheat programme of the ABP programme with high concentration of wheat production activities within the state (Wheat Farmers Association of Nigeria (WFAN), 2022).

The third stage involved random selection of two villages each from the selected five LGAs on the basis of accessibility due to insecurity and respondents' population as well as intensity of wheat production. From the reconnaissance survey carried out in the study area in 2022, the list of beneficiaries and their respective villages were collected from WFAN, Zamfara State Chapter. The villages that participated were identified on the basis of Local Government Areas as follows: Gusau LGA are: Danyashi, Gulbi Ukku, Madidi, Tullukawa- Dam Din Yamma, and Tamawa; Gummi LGA are: Zauma, Falale, Gamo, Gyalange, Gummi, Gayari, and Bardoki; while Talata Mafara LGA are: Tungar Miya, Mafara ZADP, and Gurbin Zabo-Fadama; Maradun LGA are: Goron Namaye, Maradun I-Yarkofoji, and Yan Kaiwa and Bakura LGA are: Birnin Tudu, Tukunawa, Gamji, Yardawa, Tabkin Jatau, Tsobiro, Sabon Garin Bakura, Birnin Gulbi, Gadar Makaho, Kwaisa and Gadarabu.

The fourth stage involved random sampling of to select 182 beneficiaries and 182 non-beneficiaries of ABP

### **Method of Data Collection**

Data were collected through the use of well-structured questionnaire with the help of trained enumerators. The copies of questionnaires were administered to both benefiting and non-benefiting smallholder wheat farming households in the selected wheat farming LGAs in Zamfara State.

### **Analytical Techniques**

Both descriptive and inferential statistics were used to analyze data. Descriptive statistics such as frequency distribution tables, percentages, mean and standard deviation were used and inferential statistics ie propensity score matching (PSM).

### Propensity score matching (PSM).

The PSM was used to examine the effects of anchor borrowers' programme (ABP) on the livelihood (yield, income and level of living) of benefiting smallholder wheat farmers. PSM refers to the pairing of treatment and control unit with similar values on the propensity score possibly other covariates and the discarding of all unmatched units. PSM reduces the selection bias that may be present in the non-experimental data. The propensity scores was computed using binary regression models given as:

$$P(X_i) = \Pr(d = 1/X = x_i) \quad \dots(1)$$

Where  $P(X_i)$  is the consistent estimate of the propensity score evaluated at  $x$ , was estimated in the first stage, and ATE (Average Treatment Effect), ATU (Average Treatment effect on the Untreated) was estimated in the second stage. After the propensity score was estimated and the score computed for each unit, the next stage is the actual matching. Lastly, the effect of treatment on the treated (ATT) was estimated by computing the differences across both groups (Beneficiaries and non-beneficiaries) by the following formula:

$$ATT = \frac{1}{N_1} (Y_1 - Y_0) \quad \dots (2)$$

Where ATT= average impact of Treatment on the treated,

$N_1$  = number of matches (from regression model),

$Y_1$  = the productivity index by beneficiaries,  $Y_0$  = the productivity index by beneficiaries.

A positive (negative) value of ATT suggests that smallholder wheat farmers benefited before in ABP have higher (lower) outcome variable than smallholder wheat farmers benefited after.

### Operational Definitions and Measurement of Variables

The dependent variable (Y) in this study is the level of participation in the ABP by the wheat farmers. The *a-priori* expectation is that the participating farmers would utilize productive resources availed by the programme and this lead to benefiting farmers to have higher wheat output, more income and better level of living than the non-benefiting farmers. Level of participation suggests the extent of the degree of utilization productive resources made available in a given programme. There could be different levels of utilization with some farmers being at the helm of utilization and decision making while others may lag behind in utilization of resources avail by the programme. This was measured by developing wheat farmers' utilization index score in using ABP productive resources in wheat production.

#### Effect variable (Outcome variables)

The effect of ABP in this study was determined in terms of livelihood outcomes such as increase yield, income from wheat production, level of living and was measured as follows:

- i. **Increase in yield of wheat:** In this study, yield is referred to as the total quantity of wheat the farmers harvested per unit of land area. Wheat yield was measured in kg/ha.
- ii. **Increase level of income:** is referred to as the sum total amount of money accruable from the sales of wheat measured in Naira (₦)
- iii. **Increase in level of living:** is the quality and quantity of material comfort enjoyed by farmers as a result of their participation in ABP, which led to improved social status of the wheat farmers. Increase in level of living was measured by ownership of assets such as; radio, Television (TV), cell phone, video, refrigerator, wheel barrow, farm implement (hoe, machete, cutlasses), sprayers, bicycles, motorcycles, vehicle, grinding machines, house utensils and livestock. The monetary value (price) of each asset obtained was computed in naira. As well

as the income of the farmer to determine the level of living as a result of participation in and utilization of ABP.

## RESULTS AND DISCUSSION

### Effects of ABP on smallholder wheat farmers' beneficiaries' household yield

The result in Table 1 revealed the average treatment effect of ABP on the yield of smallholder wheat farmers in Zamfara State. The four matching algorithm methods were used which are; Nearest Neighbour Matching, Radius Matching, Kernels Matching and Stratified Matching. However, only the radius method having the least bias of 20.919 among all the four matching algorithm was found to be significant at 10% level of probability. This shows that ABP had a significant effect on the yield of smallholder wheat farmers who were beneficiaries of the programme with a difference of 873.598 kg/ha of wheat against the non-beneficiaries of ABP in the study area. This finding is in agreement with the result of a study by Sambe *et al.* (2020) who revealed a statistically significant disparity in rice output between the beneficiaries and non-beneficiaries of ABP. The result is further supported by the findings of a study conducted by Idris & Jabo (2021), which showed that there was a significant increase in crop yields of farmer as a result of participating in Fadama III (AF).

**Table 1: Effects of ABP on Smallholder Wheat Farmer Beneficiaries' Household Yield**

Matching Algorithms	ATT	Std. Err	Bias	Std. Err	T-value
Nearest Neighbor Matching Method	56.246	685.773	101.561	1065.57	0.0752
Radius Matching Method	873.598	469.557	20.919	561.852	1.7052*
Kernel Matching Method	48.657	500.915	56.434	557.349	0.0889
Stratification Method	222.09	783.873	65.393	693.512	0.2595

**Source:** Field Survey (2024). Level of significant at 1 % (\*\*\*); 5% (\*\*); and 10% (\*).

### Effects of ABP on smallholder wheat farmer beneficiaries' household income

The result in Table 2 revealed the average treatment effect of ABP on the income of smallholder wheat farmers in Zamfara State. The four matching algorithms methods were used which are: Nearest Neighbour Matching, Radius Matching, Kernels Matching and Stratified Matching. Using all the four there was consistency in the sign and significant value of all the four matching algorithms. This shows how robust the PSM model is. Using Nearest neighbor matching method, Radius matching method and Kernel matching method all were found to be significant at 1% levels of probability.

**Table 2: Effects of ABP on Smallholder Wheat Farmer Beneficiaries' Household Income**

Matching Algorithms	ATT	Std. Err	Bias	Std. Err	T-value
Nearest Neighbor Matching method	221914	89500.39	7165.618	138467	2.479***
Radius Matching Method	165060	62313.1	596.594	65549.72	2.649***
Kernel Matching Method	205408	70112.75	1667.57	70863.32	2.930***
Stratification Method	211827	93612.4	8278.189	83019	2.263**

**Source:** Field Survey (2024). Level of significant at 1 % (\*\*\*); 5% (\*\*); and 10% (\*)

While, Stratification method was significant at 5% level of probability. However, of all the four matching algorithms, the Radius matching method having the least bias of 596.594 and which had a difference of 165060 in naira and statistically significant at 1% was the best method to be used in differentiating between the income of beneficiaries and non-beneficiaries smallholder wheat farmers. The finding was in agreement with result of studies by Balogun *et al.* (2021); Ajayi





& Okunola (2020) and Ayinde *et al.* (2018), who showed that ABP had a positive effect on the income of the beneficiaries.

### Effect of ABP on smallholder wheat farmer beneficiaries' household level of living

The result presented in Table 3 shows the estimation of the effect of ABP on asset accumulation (level of living) of smallholder wheat farmers. The four algorithms used are; Nearest Neighbour Matching, Radius Matching, Kernels Matching and Stratification Matching Methods. The average treatment effect (ATT) on the beneficiaries shows that ABP had positive outcome and statistically significant at varying levels of probabilities, for Nearest neighbour matching it was significant at 10%; Radius matching and Kernels matching were significant at 1%; while, Stratification matching methods was at 5% on their asset respectively. The Radius matching method had the least bias of 19018.93 and statistically significant at 1% was the best method used in differentiating between the level of living of benefiting and non-benefiting farmers. This implies that ABP beneficiaries experienced significant increase in their asset accumulation of about 527275 naira in average than the ABP non-beneficiaries. This may be attributed to quality of farm inputs used and other services provided by the ABP which affects output. The findings implied that ABP had positive effect on beneficiary's level of asset accumulation which translate to a better standard of living. This result also agrees with the Ekong, (2003) who stated that participation in ICBA activities had effect on level of living of farmers that engaged in the ICBA activities.

**Table 3: Effects of ABP on Smallholder Wheat Farmer Beneficiaries' Household Level of Living**

Matching Algorithms	ATT	Std. Err	Bias	Std.Err	T-value
Nearest Neighbor Matching Method	466753	256348.6	80297.75	258594	1.820775*
Radius Matching Method	527275	204608.6	19018.93	176064	2.576994***
Kernel Matching Method	631813	216197.3	19078.67	226106	2.92239***
Stratification Method	545615	228594.4	32269.58	239337	2.386825**

Source: Field Survey (2024). Level of significant at 1 % (\*\*\*); 5% (\*\*); and 10% (\*).

## CONCLUSION AND RECOMMENDATION

It can be concluded from the results that ABP had positive effect on the yield, income and level of living (livelihood) of beneficiaries of the programme. It was therefore recommended that the ABP or similar program be replicated in other communities by government, NGOs or private partners.

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