

## IMPACT OF AGRICULTURAL CREDIT GUARANTEE SCHEME FUND ON OIL PALM PRODUCTION IN NIGERIA

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### Abstract

Oil palm plays a crucial role in the economies of most developing nations. Nevertheless, just like other cash crops, its production and level of participation in the global market have been constrained by the lack of capital. The need to ameliorate this constraint informed the evolution of the Agricultural Credit Guarantee Scheme Fund (ACGSF) in Nigeria. The purpose of this study is to determine the impact of ACGSF on oil palm production in Nigeria. Mean and coefficient of variation were used to analyse ACGSF allocation to the oil palm subsector, oil palm output, yield and area harvested. A two-sample t-test was employed to determine changes in oil palm output and area harvested between the era before and after the evolution of ACGSF. The results reveal positive changes in oil palm output, yield and area harvested before and after the evolution of ACGSF. Statistical significance of the t-test indicates that ACGSF has a significant impact on oil output and area harvested. However, the coefficient of variation for yield, a measure of efficiency, was very low and worrisome. The findings further support the idea that increased funding is critical for increased productivity and efficiency in the agricultural sector, especially for oil palm production. The strategy should target yield increase to avoid a trade-off between oil palm farm size expansion and growth in population and urbanisation.

**Keywords:** Agricultural finance, ACGSF, farm credit, oil palm.

### Introduction

Credit is essential for improved performance of the agricultural sector (Saqib *et al.*, 2018). In

most developing countries where many farmers are poor, credit, formal or informal, remains one of the key ways through which farmers can access other forms of farm capital and inputs which might otherwise not be within their reach. Historically, the role of the government in providing agricultural credit has been linked to the development of various agricultural cooperatives which has provided for the specific needs of many small-holder farmers, lifting them out of poverty, while helping them to mitigate farm risks (Turvey, 2017). Consequently, there have been several initiatives by national governments, private sector actors, non-governmental organizations, and development partners aimed at enhancing farmers' access to credit (Asante-addo et al., 2017). These credit facilities can boost or motivate other factors of production by making the latent, potential or under-used capacities functional (Ajayi et al., 2017). While several studies have examined factors affecting farmers' access to credit (Sekyi et al., 2017; Saqib et al., 2018), others have pointed to the need to ascertain the impact of agricultural credit schemes on the production of some specific but crucial agricultural products (Chandio et al., 2018). Here, the examined the impact of the Agricultural Credit Guarantee Scheme Fund on the production of oil palm in Nigeria.

In Nigeria, a large percentage of farmers especially the rural farmers are resource-poor. The level of poverty among them has been exacerbated by the decline in agricultural productivity and astronomically increased income inequality (Ogundipe et al., 2019). Also, despite the availability of agricultural credit facilities in Nigeria, there is still rapid growth in the importation of some agricultural products, which hitherto, formed the bulk of the agricultural exports produced mainly by smallholder farmers in the country. In 2003 alone, Nigeria, which used to be the highest producer of palm oil in the world imported over 183,000 mt of palm oil (Ayeomoni and Aladejana, 2016). Data from the Food and Agriculture Organisation show that the import rose to 1,282,400 in 2019, gulping as much as \$1,599,000 of foreign exchange. This does not only indicate a decline in productivity but will further discourage local production. According to Murphy (2016), oil palm yield in Nigeria is currently around 4-6 mt ha<sup>-1</sup> for the best commercial plantations and 3-4 mt ha<sup>-1</sup> for small holders. This is a sharp drop from the potential yield capacity of at least 10 mt ha<sup>-1</sup> of oil. Therefore, to raise productivity, there is a need to examine how the intervention of the agricultural credit scheme in the country has impacted the palm oil sub-sector. Today, in countries like Malaysia and Indonesia, the palm oil industry is playing a significant role in sustaining the country's economic development via high production and a cleaner environment (Hussein et al., 2017).

Unfortunately, the economic and environmental potentials of the palm oil industry in Nigeria have not been efficiently harnessed, which calls for more research into how credit interventions can improve the sub-sector.

As averred by Gharleghi and Fah(2013), the oil palm subsector of the Nigerian economy is a potential productive sector that could be used to diversify the economy and make it resistant to the shocks from the crude oil and gas market. Thus, the growth of the subsector deserves funding support to produce sustainably. According to Adetiloye(2012), the availability of adequate credit is an enabling factor for meaningful agricultural production. It was for this reason that the Central Bank of Nigeria selected oil palm as a target cash crop for intervention through the Agricultural Credit Guarantee Scheme Fund (ACGSF).

The ACGSF is a financial programme aimed at ensuring the availability of funds to boost real sector production and lead to economic growth and development (Ayeomoni and Aladejana, 2016). It is multifarious credit schemes initiated by the Federal Government of Nigeria to finance agriculture through the provision of incentives for deposit money banks (DMBs) to extend credit facilities to Nigerian farmers. This scheme, founded by Decree No 20 of 1977 and commenced operations in April 1978 with initial 100 million naira share capital was subscribed by the Central Bank of Nigeria and the Federal Government of Nigeria (40 per cent and 60 per cent, respectively). The capitalization was subsequently shored up to N1 billion in 1999, and further up to N6 billion in 2006 (CBN, 2007 in Orok and Ayim, 2017), which is the present amount of fund available for guarantee. Under the scheme, the gross credit extension to Nigerian farmers is guaranteed up to 75% of the realisable net default value (Orok and Ayim, 2017). Ogbanje et al.(2016) reported that the scheme was expected to boost agricultural production, generate revenue for the farmers, alleviate poverty and earn foreign exchange for the country. Adetiloye (2012) added that recent innovations to the scheme by the Central Bank of Nigeria include Self-Help Group Linkage Banking, the Trust Fund Model and the Interest Drawback. Of these, the Interest Drawback Scheme seems interesting as it works to encourage bank lending at a lower rate of interest (averaging 8 percent) which is cheaper for the farmer and easier to manage for the bank.

The importance of credit to agricultural productivity cannot be over-emphasised, especially in developing countries where a majority of the farmers are resource-constrained and characterised with a smallholding. Asante-addo et al. (2017) noted that the provision of agricultural credit is critical to support the livelihood of farmers in developing countries.

Nevertheless, there are divergent opinions. According to Sekyi et al. (2017), one school of thought holds that providing rural farmers with credit would increase output and productivity. Vincent and Udeorah (2018) asserted that banks' agricultural credit policies constitute an invaluable avenue through which growth and development of the agricultural sector can be stimulated. This impact was underscored when Obilor (2013) indicated that aggregate output from the agricultural sector, responded positively to the Agricultural Credit Guarantee Scheme (ACGS) financing option in Nigeria in the past.

Another school of thought feels otherwise. For instance, banks' credit, from the study of Tariq and Izhar (2009) was not a significant predictor of productivity in India's agricultural sector. Similarly, it has been stated that while agriculture credit has a significant positive relationship to output, it falls short of the requirement for sustainable economic growth (Adetiloye, 2012). Several layers of risk and uncertainty, ranging from systematic to unsystematic, are also involved in the agricultural production process. This is why Seven and Tumen (2020) opined that access to credit markets potentially plays a crucial role in smoothing out these risks, achieving sustainable agricultural productivity growth, and supporting more efficient production decisions.

Although credit is needed to strengthen the acquisition and use of capital intensive technology in agriculture and increase the utilization of improved seedlings and other agricultural inputs to obtain a higher yield, Orok and Ayim (2017) noted that limited access to credit has contributed to retarded growth and efficiency of the sector. An important factor affecting agricultural sector productivity in Nigeria is inadequate capital (Ajayi et al., 2017). Only the public sector can provide substantial capital for agricultural development. Yet, it has been stated that formal finance is characterized as inefficient (Ahmed et al., 2012). Moreover, the macroeconomic environment in Nigeria has not been friendly with ACGSF operations (Eyo et al., 2020).

Furthermore, it has been noted that although the ACGSF has lofty aims, especially the need to make the agricultural sector more lucrative, it has not lived up to its bidding (Efobi and Osabuohien, 2011). Coupled with tardiness in the ACGSF claim process as reported by Adetiloye (2012), the impact of this financial intervention on important cash crops such as oil palm is doubtful. Thus, it is imperative to investigate if this colossal investment to boost agricultural production has yielded the desired impact in the sector. In other words, a

significant change in the output of oil palm after ACGSF would constitute some justifications for the investment in the subsector under reference. It is hoped that the findings of this study would re-invigorate policy discussions on oil palm sector development for Nigeria to key into the growing global market for oil palm.

The overarching aim of this study is to determine the impact of ACGSF on oil palm production in Nigeria. Specifically, the study seeks to: i) analyse ACGSF loan to the oil palm sector; and ii) assess oil palm production (output, yield, hectareage) in Nigeria before and after the emergence of ACGSF. It was hypothesised that: i) there is no significant change in oil palm output before and after ACGSF in Nigeria; ii) there is no significant change in oil palm area harvested before and after ACGSF in Nigeria.

### **Conceptual Framework**

Production of palm oil now accounts for 37% of the total global output of oilseeds, overtaking soybean oil as the leading vegetable oil. West Africa accounts for a negligible 3.5% (Ofosu-budu and Sarpong, 2013). Given a per capita edible oil consumption of 10-11 kg, and if all edible oil were supplied by crude palm oil (CPO), the population of West Africa would require about two million metric tonnes of CPO to be self-sufficient. However, the total supply is currently 1.4 million MT, leaving a demand gap of 600,000 MT, which is currently filled by imports. The global palm oil industry has recently witnessed unprecedented growth, with a cumulative annual growth rate (CAGR) of 8%, although West Africa's CAGR is at 1.5%. The competitive landscape is dominated by Southeast Asian producers who have better production efficiency (higher productivity at comparable costs of production, hence able to capture larger shares of the world market) and ideal climatic conditions, resulting in loss of revenue opportunity for producers in West Africa (Ofosu-budu and Sarpong, 2013).

Although, concentrated in Southeast Asia, oil palm production expanded by 1.2 million hectares (ha) in sub-Saharan Africa between 1990 and 2017, with expansion accelerating in several heavily forested countries since 2000. Large tracts of unconverted land, an abundance of rural labour and growing domestic demands for palm oil signal potential production growth in the region (Ordway et al., 2017). Nigeria dominated oil palm production at the early stage. That story has changed. According to Tiku and Bullem (2015), Between 1961 and 1965 world oil palm production was 1.5 million tonnes, with Nigeria accounting for 43%. However, since then, oil palm production in Nigeria has virtually been stagnated. Today, world oil palm production amounts to 14.4 million tonnes, with Nigeria which is one of the largest producers

in West Africa, accounting for only 7%.

Malaysia and Indonesia dominate world production and trade with 90% of global output (Ofosu-budu and Sarpong, 2013). Indonesia is the highest producer of oil palm in the world. According to Sequiño and Avenido (2015), in 2012, the industry contributed US\$17.6 billion through exports to Indonesia's economy. The total land area planted to oil palm in Indonesia has reached 9.7 million hectares. With these impressive statistics, the country is still poised to increase plantation areas to produce a higher volume of crude oil to serve the needs of the world market. This is because the demand for crude palm oil has soared high due to the increasing awareness of the various uses of palm oil. According to Bakoumé et al. (2020), the use of palm oil for the production of biodiesel has added greatly to the continent's demand for the commodity, an asset upon which countries from the African oil palm belt are eager to capitalise on.

### **Empirical Review**

Sulaimon (2021) evaluated the thresholds of ACGSF on agricultural performance (proxied by real agricultural Gross Domestic Product) in Nigeria between 1981 and 2019. Using threshold regression, the result showed that ACGSF had significant positive effects on real agricultural GDP. Eyo et al. (2020) assessed the ACGS under the Nigerian macroeconomic environment. The study employed ADF, ARDL co-integration test and ordinary least square method. The result of the OLS showed that the number of loans guaranteed, number of commercial banks and value of credit guarantee have a significant effect on agricultural sector output. From the result of ARDL, the coefficient of price deflator of agricultural commodities, stock market capitalization, nominal exchange rate and value of agricultural output were positive but only the value of agricultural output had a significant effect on the volume of loan guaranteed by the ACGS at 5% level of significance.

Anh et al. (2020) investigated the short-run and long-run impacts of agricultural credit on Vietnam's agricultural GDP over the period 2004:Q4–2016:Q4, with the incorporation of agricultural labour, public investment and rainfall as important determinants of agricultural GDP. The study applied the indicator saturation (IS) break tests and the autoregressive distributed lag (ARDL) bounds test with structural breaks to examine the credit–agricultural performance nexus. The causal relationships among variables are explored through the Toda–Yamamoto Granger causality test. The results indicate that agricultural credit positively

influences agricultural GDP in both the short-run and long-run. A unidirectional causal relationship running from credit to agricultural GDP is confirmed.

Reuben et al.(2020) assessed Agricultural Credit Guarantee Scheme Fund and its effect on agricultural output in Nigeria. The trend revealed that the supply of funds to the agricultural sector from the scheme has always increased in a wobbly pattern. It was found that funds guarantee to crop-sub sector increased steadily from 1998 to 2009. The study concluded that ACGSF has a positive effect on agricultural output in Nigeria.

Oparinde et al.(2017) determined the influence of the Agricultural Credit Guarantee Scheme Fund on fishery development in Nigeria using annual time-series data between 1981 and 2012. The study employed descriptive Statistics, Growth Function and Autoregressive Distributed Lag. The results of the analysis showed that the fishery sub-sector was the least financed in the agricultural sector of the economy. This is reflected in the low contribution of the fishery sub-sector to Gross Domestic Product (GDP) due to the fact that the required importance is not given to the sub-sector as it is poorly financed by ACGSF.

Ajayi et al.(2017) evaluated the impact of agricultural financing policy and deposit money bank loans to the agricultural sector on agricultural productivity, using time series data from 1981 to 2015. Employing a linear regression model, the study found that agricultural financing policy proxy by Agricultural Credit Guarantee Scheme Fund (ACGSF) have a significant positive impact on agricultural productivity.

Orok and Ayim(2017) determined the impact of the Agricultural Credit Guarantee scheme fund (ACGSF) on Agricultural Sector Development in Nigeria from 2001 to 2016. The study used ADF, co-integration test and the ordinary least square (OLS) of multiple linear regression techniques which was transformed into a log-linear model. The study found that, at 0.05 level, agricultural credit guarantee to cash crop had no significant effect on the crop gross domestic product.

Egwu (2016) diacussed the impact of agricultural financing on agricultural output, economic growth and poverty alleviation in Nigeria. The study employed the ordinary least square regression technique, T-test, R-Square, Standard Error Test and Durbin Watson test ADF/PP unit root and co-integration test. The finding showed that Agricultural Credit Guarantee Scheme Fund Loan to Nigeria's Agricultural sector (ACGSF) had a significant effect on the Agricultural sector output percentage ratio to gross domestic product.

Ogbanje et al.(2016) determined the direction of causality between the Agricultural Credit

Guarantee Scheme Fund (ACGSF) and Agricultural Gross Domestic Product (AGDP) in Nigeria, and used secondary data for the study, spanning from 1980 to 2013. The study found that there was unidirectional causality running from AGDP to ACGSF without feedback.

Ojo and Oluwaseun(2015) examined factors militating against the effectiveness of the Agricultural Credit Guarantee Scheme Fund (ACGSF) in South-Western Nigeria. Using cross-sectional data, the result showed that 71.25% were ignorant of the ACGSF activities. The major challenge with the scheme was guarantorship (43.25%).

Ekwere and Edem(2014) evaluated the effect of agricultural credit facility on agricultural production and rural development in Etinan Local Government Area of Akwa Ibom State. Using Cobb-Douglas production function analysis, the study showed that access to agricultural credit impacted positively on agricultural production.

Zakaree(2014) examined the effect of the Agricultural Credit Guarantee Scheme Fund (ACGSF) on domestic food supply in Nigeria. The results show a robust Adjusted R-square of about 86.3 percent. The value of t-Statistics of each of the explanatory variables shows 3.0323 for ACGSF, 6.8480 for rural population and 2.5418 for annual average rainfall, indicating that the explanatory variables were statistically significant in explaining domestic food supply in Nigeria. Meanwhile, the results give a coefficient of 0.14454 for Agricultural Credit Guarantee Scheme funds (ACGSF), 7.17082 for rural population and -1.4870 for the annual average rainfall. It implies that a change of one percent in Agricultural credit facility to the farmers in the agricultural sector will bring about a change of about 0.14 percent, 7.17 percent and 1.48 percent respectively, on domestic food supply in Nigeria.

Adetiloye (2012) worked on Agricultural Financing in Nigeria: An Assessment of the Agricultural Credit Guarantee Scheme Fund (ACGSF) for Food Security in Nigeria (1978-2006). The study found that though a credit to the agricultural sector was significant, it was not growing relative to the economy. In addition, the ACGSF settled claims were negatively significant and tardiness observed in the claims process.

## **Methodology**

The study covered the entire oil palm subsector of Nigeria's economy as well as the ACGSF component for the oil palm. The study focused on Nigeria's economy. Nigeria, a West African country and a former British colony plays central roles in the economic stabilization in the West African sub-region and Africa at large. As at 2021, the country has an estimated population of 213,000,000, most of whom are resident in rural areas. Nigeria's rural areas are



characterized by poverty, lack of basic amenities and agricultural production. As a matter of fact, agriculture in Nigeria is dominated by millions of small-scale farmers with holdings that range from one to three hectares. Till now, food production is largely unmechanised because these resource-poor farmers cannot afford mechanization. The economy relies heavily on the extractive industry, the reason it is classified as a developing country. These industries are mainly oil and agriculture (<https://www.statista.com>).

Nigeria's agriculture contribution to GDP makes it the largest sector in the country. Crop production accounts for a huge chunk of activities in the sector representing 88% of total industry size with livestock, forestry and fishing, accounting for the balance of 12%. The sector achieved GDP of US\$113.64 billion in 2014, the highest between 2013 and 2017. Since then, the sector's contribution has been declining due to low agriculture yields, conflicts such as terrorism and the herdsmen crisis, as well as the impact of climate change. Agriculture contribution to Nigeria's GDP dropped by 31% from US\$113.64 billion in 2013 to US\$78.45 billion in 2017 (PWC, 2018).

Development partners have supported growth in the agricultural sector over the decades. They have channeled funding towards capacity development, policy development and implementation, improved farming methods and best practices, as well as enhanced yields and output, among others. Notable among the development partners are the African Development Bank (AfDB), the Alliance for a Green Revolution in Africa (AGRA), the Food and Agriculture Organisation (FAO) and the Bill and Melinda Gates Foundation. Foreign government funding have also emerged in the last decade mainly through the United States Agency for International Development (USAID), the Netherlands Embassy, the Department for International Development (DFID) (PWC, 2018).

Numerous cash crops such as oil palm, cocoa, sorghum, cotton etc thrive in the country. However, the agricultural sector is dominated by smallholdings. Capital constraint is palpable, hindering agricultural development in the country. These factors constitute the drive for financial interventions of the Central Bank of Nigeria (CBN), including the ACGSF, which aims to increase the productivity of target crops like oil palm and others.

Secondary data used for the study were obtained from the Statistical Bulletin of CBN and FAOSTAT. The data spanned from 1961 to 2019. The period is divided into two eras, namely the eras before (1961 to 1980) and after (1981 to 2019) the emergence of ACGSF. The data were analysed using descriptive statistics such as mean, standard deviation, coefficient of

variation, Pearson Product Moment Correlation and test of the mean difference. The models, their specifications and *a priori* expectations are as follow:

**Coefficient of variation (cv),**

$$cv = \frac{\sigma}{\mu}$$

where,

$\sigma$  = population standard deviation

$\mu$  = population mean

**Test of mean difference**

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{SX_1^2}{NX_1} + \frac{SX_2^2}{NX_2}}}$$

$t$  =  $t$  - statistic

$\bar{X}_1$  = mean output of oil palm after ACGSF

$\bar{X}_2$  = mean output of oil palm before ACGSF

$SX_1^2$  = standard deviation of mean output of oil palm after ACGSF

$SX_2^2$  = standard deviation of mean output of oil palm before ACGSF

$NX_1$  = number of years after ACGSF

$NX_2$  = number of years before ACGSF

**Results and Discussion**

**ACGSF to Oil Palm Sector in N'000,000 (1981 to 2019)**

As shown in Table 1, the sum of N1,844,814.90 million (US\$13,742.25 million) was extended to the oil palm sub-sector between 1981 and 2019 under ACGSF. Mean ACGSF within the period was N47,302.94 million (US\$352.37). The minimum and maximum amounts of credit within the period were N7.50 million (US\$0.21 million) and N275,520.0 million (US\$1,749.34 million), respectively. This indicates a measure of the government's commitment to increase oil palm production for both local consumptions at household and industrial levels and export. Onyiriuba et al.(2020) affirmed that the goal of agriculture financing is to open up the economy and promote its reliance on the market and economic forces so that the economy can move towards greater competitiveness in international markets. The volume of credit advanced under this scheme could be an attribute of the guarantee or cover provided by the government. This, according to Sulaimon(2021), reduces

the value at risk and encourages banks to increase and sustain credit to agriculture. Asante-addo et al.(2017) empirically reported that the fear of loan default and lack of savings are reasons for non-participation in credit programmes in Ghana. One can then assert that the guarantee component also encourages farmers to access the facility for greater productivity. Another reason could be that the loan was given at a single-digit interest rate. Ojo et al. (2019) asserted that while it is important to bridge the farm-level financing gap, this can only be beneficial to the farmers at single-digit interest rates.

This colossal financial commitment/investment is expected to generate substantial production statistics like output, yield and area harvested. The coefficient of variation of 148.5% indicates that a very wide dispersion from the mean, indicating instability of funding pattern. This can exhibit an adverse impact on production.

**Table 1: ACGSF Loan to Oil Palm Sector in ₦'000,000 from 1981 to 2019**

<b>Statistics</b>	<b>Oil Palm ACGSF (₦'000'000)</b>	<b>US\$ Equivalence (000,000)</b>
Sum	1,844,814.90	13,742.25
Mean	47,302.95	352.37
Minimum	7.50	0.21
Maximum	275,520.00	1,749.34
Standard Deviation	70,224.06	
Coefficient variation	1.49	
Skewness	1.38	
Kurtosis	4.12	

**Source: Computed with data from CBN Statistical Bulletin, 2021**

### **Summary Statistics of Oil Palm Production from 1961 to 2019**

The result of the summary statistics of oil palm production from 1961 to 2019 is presented in Table 2. It is divided into two eras namely, before and after the evolution of ACGSF. The result shows that mean oil palm production (mt), yield (kg/ha) and area harvested (ha) increased by 1,845,248.10, 1,124.69 and 608,778.80 respectively. These increases translated to 32.44%, 4.50% and 26.76%, respectively. *Ceteris paribus*, change in output is a proportionally a function of area harvested. This result is, however, different. The possible reason could be the emergence of improved variety or improved management practices of the crop at some points during the period under investigation. These variables are attributes of credit facilities, invariably ACGSF, ignoring other confounding factors. Also, farmers

possibly attained a higher level of technical efficiency in production with the availability of credit. As noted by Ojo et al.(2019), the technical efficiency of farmers plays a very critical role in determining the actual amount of credit needed to bridge the farm-level financing gap and impact positively on productivity.

The changes are in line with the expected impact of ACGSF. At random, this result underscores the relevance of ACGSF to the oil palm subsector. It is a measure of proper credit utilisation. Besides, an increase in the output of a cash crop with versatile and industrial usage as oil palm is desirable for reversing huge import bills and saving the same for the furtherance of the development of the agricultural sector. Vaughan et al.(2014) deduced that Nigeria imported an average of ₦1.923 trillion worth of commodities per annum (at current prices) in the period. In essence, the nation imported about ₦1.0 billion worth of food per day in the period 1990-2011. This was about USD 9.28 million worth of food per day in the period. Available data from FAOSTAT showed that Nigeria spent 462,791.00 (USD'000) on oil palm import between 1961 and 2019. As a measure of keeping the country out of recession, Ashagidigbi et al. (2017) opined that there must be a concerted effort in drastically reducing food import bills and enhancing local production of these crops that are mainly imported. Kofarmata et al.(2019) lamented the risen food import bills of Nigeria which had inflated to over \$11bn per annum.

However, yield, which is a measure of production/land efficiency has a very low percentage change of 4.50%. The implication is that while the ACGSF targeted and achieved a substantial increase in absolute output, it did not do well in this all-important aspect of efficiency. Yield is important for oil palm because it requires a large land area for the establishment of the plantation. With the growing population and urbanization leading to declining farmland in Nigeria, production intensification should be the target of interventions. According to Ojo et al.(2017), the expansion of oil palm plantations is a major driver of land grabbing, deforestation and biodiversity loss in Cross River State, and is leading to serious threats to its land and people. This is because the forest is being cleared resulting in deterioration of the environment. Consequently, local people are impoverished as they lose a major source of income, land, and socio-cultural values associated with the forest. The coefficients of variation of production before and after ACGSF were 10.8% and 17.5%, respectively. This implies that the dispersion around mean production was greater with ACGSF than without. Large CV indicates instability which has implications for agro-

industries, which could precipitate importation of raw materials or finished productions, with attendant consequences on the economy.

**Table 2: Summary statistics of Oil Palm Production from 1961 to 2019**

	BEFORE ACGSF (1961 – 1980)			AFTER ACGSF (1981 – 2019)		
	Oil Palm Production (mt)	Oil Palm Yield (hg/ha)	Oil Palm Area Harvested (ha)	Oil Palm Production (mt)	Oil Palm Yield (hg/ha)	Oil Palm Area Harvested (ha)
Mean	5,687,500.00	25,000.00	2,275,000.00	7,532,748.10	26,124.69	2,883,778.80
Minimum	5,000,000.00	25,000.00	2,000,000.00	4,750,000.00	24,923.00	1,900,000.00
Maximum	6,750,000.00	25,000.00	2,700,000.00	10,025,174.00	26,992.00	3,934,935.00
Standard deviation	614,383.52	-	245,753.41	1,321,328.10	687.248	510,350.81
Coefficient of Variation	0.108	-	0.108	0.175	0.026	0.177

Source: Computed with data from FAOSTAT, 2021

**The Difference in Oil Palm Output Before and After ACGSF Evolution**

The result of the test of difference in oil palm output before and after ACGSF is presented in Table 3. The result revealed that the t-statistic (-5.9077) was statistically significant ( $p < 0.01$ ), in favour of the era after the intervention of ACGSF. Hence, the null hypothesis that the change in oil palm output before and after ACGSF is not different from zero cannot be accepted. Instead, the alternative hypothesis is accepted, implying that there is a significant difference in oil palm output before and after ACGSF. The result is in line with the *a priori* that the output increased after ACGSF. It also means that the facility achieved the pre-determined goal set by the Central Bank of Nigeria.

The result of this study is similar to Sulaimon(2021) that ACGSF has significant positive effects on real agricultural GDP at ₦1,060,389 ('000) (US\$1,716,673.14) and ₦5,951,809 ('000) (US\$19,391.99) thresholds between 1981 and 2019. The author also noted that access to credit can lower the entry barrier and encourage new entrants into agriculture, thus leading to increased agricultural output on the aggregate. The result is also in line with Ekwere and Edem (2014) that access to agricultural credit impacted positively on agricultural production in Etinan. Ukwuaba *et al.* (2020) implicated inadequate credit in low output and inefficiency among farmers.

In addition, the result supports the school of thought that credit enhances production. As noted by Sulaimon (2021), credit financing remains one of the key ingredients to achieving sustainable economic activity, leading to growth, in any country. Sekyi et al. (2017) also stated that the availability of credit allows for use of improved inputs and thus has the potential to increase the production and welfare of smallholder farmers in Ghana. Since increased output has bearing on GDP, the result of this study conforms with Anh et al. (2020) that agricultural credit positively influences agricultural sector development. Adekunle and Ndukwe (2018) reported that in the 4<sup>th</sup> quarter of 2016, the dominant contribution of the crop sub-sector in Nigeria could be attributed to the large share of the sector in the disbursement of the Agricultural Credit Guarantee Scheme. However, the result of this study contradicts Odior (2014) that credit to the agricultural sector has no significant impact on agricultural performance.

**Table 3: Difference in Oil Palm Output Before and After ACGSF Evolution**

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
Before ACGSF	20	5687500	137380.3	614383.5	5399960	5975040
After ACGSF	39	7532748	211581.8	1321328	7104423	7961073
combined	59	6907240	186112.6	1429558	6534695	7279785
diff		-1845248	312344.1		-2470706	-1219790
diff = mean(before A) - mean(after AC)				t =	-5.9077	
Ho: diff = 0		degrees of freedom =		57		
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0		
Pr(T < t) = 0.0000		Pr( T  >  t ) = 0.0000		Pr(T > t) = 1.0000		

*\* statistical significance at 0.01 level*

### **The Difference in Oil Palm Area Harvested Before and After ACGSF**

The result of the test of difference in oil palm area harvested before and after ACGSF is presented in Table 4. The result revealed that the t-statistic (-6.1818) was statistically significant ( $p < 0.01$ ), in favour of the era after the intervention of ACGSF. Hence, the null hypothesis that the change in oil palm area harvested before and after ACGSF is not different from zero cannot be accepted. Instead, the alternative hypothesis is accepted, implying that

there is a significant difference in oil palm area harvested before and after ACGSF. The result is in line with the *apriori* that the area harvested increased after ACGSF. The result supports the belief that credit enables farmers to acquire farm inputs, the most critical for oil palm which is farmland.

**Table 4: Difference in Oil Palm Area Harvested Before and After ACGSF**

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
before ACGSF	20	2275000	54952.13	245753.4	2159984	2390016
after ACGSF	39	2883779	81721.53	510350.8	2718342	3049215
combined	59	2677413	68259.9	524314.2	2540776	2814050
diff	-608778.8	98479.16		-805989.2	-411568.4	
diff = mean(before A) - mean(after AC)				t = -6.1818*		
Ho: diff = 0		Satterthwaite's degrees of freedom = 56.8766				
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0		
Pr(T < t) = 0.0000		Pr( T  >  t ) = 0.0000		Pr(T > t) = 1.0000		

\* *statistical significance at 0.01 level*

The result of this study confirms the assertion of Sulaimon (2021) that credit translates to improved agricultural productivity through access to more critical inputs like fertilizer, land, improved seedlings, machinery, storage facilities to prevent post harvest waste and irrigation facility for dry season farming.

### **Conclusion and Policy Implications**

The study evaluates the impact of the Agricultural Credit Guarantee Scheme Fund on Oil Palm Production in Nigeria. Using the arithmetic mean and coefficient of variation, the volume of ACGSF as well as oil palm output, yield and area harvested were analysed. A two-sample t-test was employed to test the significance of the change, positive or negative, in oil palm output and area harvested before and after the evolution of ACGSF. The findings revealed that a humongous amount of money was extended to the oil palm subsector under ACGSF between 1981 and 2019. A very wide dispersion from the mean was observed in ACGSF. Percentage changes in oil palm output, yield and area harvested before and after the evolution of ACGSF were positive, with the output recording the highest and yield having the

lowest. The positive changes in oil palm output and area harvested before and after the evolution of ACGSF were statistically significant, and not due to random errors.

The findings have several implications for the management of ACGSF, the agro-industrial sector and Nigeria's economy as a whole. There is a need to increase ACGSF to the oil palm subsector, post evolution of ACGSF. This will lead to an increase in the output of oil palm and its industrial components. The outcome will range from large local supplies of oil palm related raw materials which will translate to lower production cost for relevant agro-industries and, invariably, affordable prices for the processed products and growth in the gross domestic product for Nigeria. In addition, there will be an increase in farm income for those involved in the production and employment generation for those who operate along the oil palm value chain. Ultimately, this will lead to poverty reduction and increased oil palm farmers' welfare. Similarly, Nigeria can increase its exports and attract foreign exchange, thereby improving the balance of trade. Furthermore, oil palm import fund can be saved and used to fix deficiencies in other sectors of the agricultural economy.

The Central Bank of Nigeria should minimise the wide variation observed in the allocation of fund under the scheme to the oil palm subsector. This will facilitate effectiveness in oil palm production planning as well as industries that rely on the subsector so that they can work towards a cut in the importation of raw materials. Dealers in finished products will also rely on local supplies rather than imported goods.

Policymakers in the ACGSF-oil palm subsector nexus should work assiduously towards directing ACGSF towards increasing oil palm output per unit area, as the plan for expansion of oil palm is probably being contemplated. The use of high-yielding varieties with desirable characteristics for additional plots and the replacement of old plantations is imperative. These measures will minimise the conflict over land as population and urbanisation increase steadily in the country. In addition, farmers' earnings will increase, thereby enhancing profitability and reversing the ugly trend in loan default incidences. These findings have policy relevance for other countries where farmers face capital constraint and agriculture is a dominant sector.



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