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INFLUENCE OF AGRICULTURAL CREDIT GUARANTEE SCHEME FUND (ACGSF) ON FISHERY DEVELOPMENT IN NIGERIA

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Abstract

Access to credit has been identified as a crucial tool in increasing fish production in the developing countries like Nigeria. ACGSF was established for the purpose of boosting agricultural production (fish production inclusive). It is, therefore, imperative to study the Influence of Agricultural Credit Guarantee Scheme Fund on fishery development in Nigeria. Annual time-series data between 1981 and 2012 were collected on relevant variables and analysed using Descriptive Statistics, Growth Function and Autoregressive Distributed Lag. The results of the analysis showed that fishery sub-sector was the least financed in the agricultural sector of the economy. This is reflected in low contribution of 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. Also, growth rate of fishery contribution to GDP was 10.63% and the proportion of GDP from fishery to total GDP from Agriculture was 0.005%. In the long run, volume of loan to agriculture and fishery had positive and negative relationship respectively with GDP from fishery. The short run dynamics adjusts to the long run equilibrium at the rate of 34% per annum. In conclusion, fishery sub-sector has been experiencing poor finance from Agricultural Credit Guarantee Scheme Fund. Therefore, the study recommended that volume of ACGSF credit devoted to fishery sub-sector should be significantly increased if sustainable development will be recorded in the sub-sector. Also, credit given to the sub-sector should be monitored in order to prevent diversion and poor management.

Key words: *ACGSF, Fishery, GDP, ARDL, Nigeria*

INTRODUCTION

It is an indubitable truism that fish has become the important source of protein to people in order to substitute for other animal proteins [30] because fish products are seen to be relatively cheaper compare to beef, pork and other animal protein sources in Nigeria [6]. Millions of people around the world including many in developing countries like Nigeria derive their means of livelihoods along fishing value chain while about 2.6 billion people get their protein from seafood. Also, fishing provides job opportunities for millions of people in Africa and provides a vital source of protein to over 200 million people. Another fact is that about 30% (29.5 Mt) of the world fish catch is used for non-human consumption such as production of fishmeal and fish oils that are used as feeds and raw-materials in agriculture, aquaculture, and industries. Fishmeal and fish oils are important in aquaculture production as they form key dietary components depending on the species being cultured [1].

About 2% of the national Gross Domestic Product is accounted for by the fisheries sub-sector of the Nigerian agricultural economy [26]. [2] noted that the declining supplies of capture fisheries can be adequately reversed by fish-aquaculture industry, while [20] observed that in a bid to reduce the existing supply-demand gap in Nigeria, fish farming is quickly gaining increased relevance. The rate at which seafood is being consumed domestically in Nigeria is very high, therefore, almost all the fish produced is consumed. The fish deficit in Nigerian is about one million tons annually due to the increasing demand for fish protein equivalent to 40% of the total animal protein requirement in the country [8].

No wonder the governments of the continent of Africa, under the umbrella of the African Union, have identified the great potential of fish farming and are determined to encourage private sector investment in the subsector of the economy of African countries [25]. However, despite the abundant fisheries resources and the relatively high consumption of fish in Nigeria that is the largest simple consumer of fish products in Africa, its domestic output of 0.62 million metric tons still falls short of demand of 2.66 million metric tons [17]. The contribution of Sub-Saharan Africa to aquaculture production at world level is less than 1% [19]. To support future needs, capture fisheries have to be sustained and if possible enhanced, and aquaculture should be developed rapidly, to increase by over 260% i.e. an annual average of more than 8.3% by 2020 in sub-Saharan Africa alone [23].

According to [21], it is estimated that over 1.3 million tons of fish is consumed annually, whilst about 700,000 tons of frozen fish is imported per annum [8]. The existing gap between supply and demand is being offset by the imported fish in the country. Nigeria's domestic fish supply is from artisanal, commercial trawler, and aquaculture (fish farming) sources, with the artisanal fishery contributing more than 80% of the domestic production [16]. According to [15], there is need to close the gap between fish demand and supply in Nigeria as fish supply is 400, 000 tons in comparison to 800,000 tons of demand.

A supply deficit of 2.04 million metric tons is required to meet the ever increasing demand for fish in Nigeria. Nigeria is a large importer of fish with official records indicating 681,000 metric tons while export in 2008 was 0.065 million metric tons and valued at US$40.5 million. The local supply consists of productions from the artisanal was (89.5%-85.5%) while industrial and aquaculture subsector was (5%-2.5%) and (5.5%-12.0%) respectively [18]. However, it has been demonstrated that Nigeria is capable of substituting fish importation with domestic production in order to create employment, reduce poverty in rural and peri-urban areas where 70% of the population live and ease the balance of payment deficits [29].

Access to credit has been identified as a crucial tool in increasing fish production so as to bridge the gap between fish demand and supply in the developing countries like Nigeria. Increased domestic fish production will discourage fish importation but facilitate job creation. This is the reason why the Federal Government of Nigeria established Agricultural Credit Guarantee Scheme Fund (ACGSF) as it acknowledged the importance of agricultural credit to boost agricultural production including fish production. Therefore, evaluation of the influence of the ACGSF on the fishery development will give useful information for the formulation of policies targeted towards food security and sustainable fishery development in Nigeria. This is necessary since domestic fish production cannot meet up with the demand even with the establishment of ACGSF.

Overview of Agricultural Credit Guarantee Scheme Fund (ACGSF)

Agricultural Credit Guarantee Scheme Fund (ACGSF) was introduced as encouragement to commercial and merchant banks to give agricultural credit loan to farmers. The scheme began operation in 1978 with the Central Bank of Nigeria (CBN) managing the fund provided. Under the scheme, bank loans to the agricultural sector are guaranteed up to 75% of the amount in default by the farmer. The fund was set up by the Federal Government and the CBN in the ratio of 60:40. The following reasons necessitated the establishment of ACGS; high risk and uncertainty owing to natural hazards, threat of diseases and pest to crops/livestock, long gestation period required for livestock/crops to mature. The activities of ACGSF cover livestock, fisheries, food crops, cash crops and other agricultural activities [7].

Most often, financial institutions require huge collateral from customers before loans are granted to them. This is harmful to farmers' efforts at getting such loans to enhance their production. The ACGSF is aimed at reducing this dearth by guaranteeing these farmers or other individuals involved in agricultural production when seeking for loans from the banks [10].

The purpose of the fund is to provide guarantee in respect of loans granted by any bank for agricultural purposes.

MATERIALS AND METHODS

Data Sources and Collection

Annual time-series data, for this study on relevant variables, were collected from various issues of Central Bank of Nigeria Annual Reports and other relevant publications from 1981-2012.

Analytical Technique

Descriptive statistics, Growth function and Autoregressive Distributed Lag Model were used in the analysis of the data collected.

Growth Function Model Specification

There are various methods that can be used in computing the compound growth. According to [7] and [28] who stated that one of the methods is to use data at the beginning and at the end of a period which has been shown to ignore vital information. [11] observed that such a measure of growth is influenced heavily by the choice of years and it also ignores the information lying in-between the two selected years. It is, therefore, appropriate to choose that measure which takes into account the entire series observation. Following [11], this study adhered to the compound growth rate that was computed by fitting the exponential function in time to the data by using the following formula:

$$Y = b_0 e^{bt} \quad (1)$$

After linearizing in logarithm, equation 1 turns to:

$$LogY = b_0 + b_1 t \quad (2)$$

where:

Y= GDP from fishery subsector

t = Time trend variable

b_0, b_1, = Regression parameters to be estimated

The growth rate (r) is given by

$r = (e^b - 1) \times 100$

where e is Euler's exponential constant (2.7183).

In order to investigate the existence of acceleration, deceleration or stagnation in growth rate of GDP from fishery and Proportion of GDP from fishery to Agriculture, quadratic equation in time variables was fitted to the data for two periods (1981-1999 and 2000-2012) following [3] as follows:

$$LogY = b_0 + b_1 t + b_2 t^2 \quad (3)$$

The quadratic time term t^2 allows for the possibility of acceleration or deceleration or stagnation in growth during the period of the study. Significant positive value of the coefficient of t^2 confirms significant acceleration in growth, significant negative value of t^2 confirms significant deceleration in growth while non-significant coefficient of t^2 implies stagnation or absence of either acceleration or deceleration in the growth process. These two periods under consideration were chosen because of increase in fund being used by ACGSF in the late 1999. The fund was enhanced to ₦1billion on the 8th December, 1999 from the initial ₦100 million and further increased to ₦4billion in 2006.

Autoregressive Distributed Lag Model

In co-integration studies, many studies have employed vector auto-regressive (VAR) model to establish multivariate relationship but the use of Autoregressive Distributed Lag (ARDL) model is not popular in analyzing the relationship among variables of interest in fishery subsector. The bounds testing (Autoregressive Distributed Lag (ARDL) Model) co-integration procedure as used by [31]; [32]; [14] empirically analysed the long-run relationships and dynamic interactions among the variables of interest. It is against this background that ARDL is considered imperative to analyze relationship that exists among the selected climatic variables on ACGSF loan and GDP contribution from fishery subsector in this study.

In ARDL bounds test, it is not compulsory that the variables of interest should be integrated of the same order in bounds approach unlike other techniques such as the Johansen co-integration approach. The ARDL bounds testing approach is applicable whether the variables (regressors in the model) are purely I(0), purely I(1), or mutually co-integrated. It is found that bounds approach is suitable for small sample which makes it more superior to that of multivariate co-integration (for details, see [33].

The hypothesis of no co-integration among the variables against the presence of co-integration among the variables was tested using F-test of the joint significance of the

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coefficients of the lagged levels of the variables. Regardless of whether the variables are *1(0)* or *1(1)*, the F-test has a non-standard distribution. Inference is made based on two sets of adjusted critical values with lower and upper bounds. It is assumed that that all variables are *1(0)* by one set, while the other set assumes that they are all *1(1)*. The rule is that the null hypothesis of no co-integration is rejected if the computed F-statistics falls above the upper bound critical value. Conversely, the null hypothesis cannot be rejected if the computed F-statistics falls below the lower bound, while the result would be inconclusive if it falls between the lower and upper bound [33].

The hypothesis can be stated as follows;

The null hypothesis of no co-integration (no long-run relationship) among variables of interest is given as:

$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$

The alternative hypothesis (there is long-run relationship or co-integration exists) among variables of interest is given as:

$H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0.$

The relationship between Gross Domestic Product (GDP) from fishery subsector, volume of ACGSF loan to fishery subsector, number of ACGSF loan to fishery subsector, volume of ACGSF loan to agriculture and number of ACGSF loan to agriculture is expressed implicitly as follows;

$$GDPF = f(VLF, NLF, VLA, NLA) \qquad (4)$$

where: *GDPF* = Gross Domestic Product (GDP) from fishery subsector (Naira)

VLF = Volume of ACGSF loan to fishery subsector (Naira),

NLF = Number of ACGSF loan to fishery subsector,

VLA = Volume of ACGSF loan to agriculture (Naira),

NLA = Number of ACGSF loan to agriculture.

As observed by [5], the variables were transformed and measured in their natural logarithm (ln) for easy interpretation of coefficients in standardized form of percentage. According to [33], the ARDL model specification of equation (4) is expressed as unrestricted error correction model (UECM) to test for co-integration between the variables under study:

$$\Delta \ln GDPF_t = \beta_0 + \sum_{i=1}^{q} \beta_1 \Delta \ln GDPF_{t-i} + \sum_{i=0}^{q} \beta_2 \Delta \ln VLF_{t-i} + \sum_{i=0}^{q} \beta_3 \Delta \ln NLF_{t-i} + \sum_{i=0}^{q} \beta_4 \Delta \ln VLA_{t-i} + \sum_{i=0}^{q} \beta_5 \Delta \ln NLA_{t-i} + \omega_1 \ln GDPF_{t-1} + \omega_2 \ln VLF_{t-1} + \omega_3 \ln NLF_{t-1} + \omega_4 \ln VLA_{t-1} + \omega_5 \ln NLA_{t-1} + e_t \qquad 5$$

Once co-integration is established, the long run relationship is estimated using the conditional ARDL model specified as:

$$\ln GDPF_t = \beta_0 + \omega_1 \ln GDPF_{t-1} + \omega_2 \ln VLF_{t-1} + \omega_3 \ln NLF_{t-1} + \omega_4 \ln VLA_{t-1} + \omega_5 \ln NLA_{t-1} + e_t \qquad 6$$

The short run dynamic relationship is estimated using an error correction model specified as:

$$\Delta \ln GDPF_t = \beta_0 + \sum_{i=1}^{q} \beta_1 \Delta \ln GDPF_{t-i} + \sum_{i=0}^{q} \beta_2 \Delta \ln VLF_{t-i} + \sum_{i=0}^{q} \beta_3 \Delta \ln NLF_{t-i} + \sum_{i=0}^{q} \beta_4 \Delta \ln VLA_{t-i} + \sum_{i=0}^{q} \beta_5 \Delta \ln NLA_{t-i} + \delta ecm_{t-1} + e_t \qquad 7$$

where; β_0 = Constant term, ln = Natural log, et = White noise, $\beta_1 - \beta_5$ = Short run elasticities (coefficients of the first-differenced explanatory variables), $\omega_1 - \omega_5$ = long run elasticites (coefficients of the explanatory variables), ecm_{t-1} = Error correction term lagged for one period, δ = Speed of adjustment, Δ = First difference operator, q = Lag length.

RESULTS AND DISCUSSIONS

Sub-sectoral Loan Allocation in Agricultural Sector

ACGSF Loan Allocation in Agricultural Sector between 1981 and 2012 as shown in Fig. 1 indicates increase in the value of loan to the sector as a whole and also in nearly all the sub-sectors. However, it is crystal clear that crop sub-sector was given priority at the expense of other sub-sectors as it took the largest proportion of the sectoral loan from ACGSF during the period under study. This had direct impact on the level of GDP from these sub-sectors because the GDP contributions from fishery and livestock could not be compared to that of crops, which had the highest. The implication of this is that the two other sub-sectors could also record higher

GDP as the value of loan allocated is increasing. This had been noticed by [7] who stated that as it is the case of past programmes such as World Bank loans that have always been focused on the crop sub-sector to the detriment of the livestock sub-sector, a large portion of the activities of ACGSF is geared towards the crop sub-sector. Considering the level of local fish production and its importance both nutritionally and economically, it is desirable for ACGSF to drastically step up the value of loan that goes to fishery sub-sector so as to increase production that is very needful at this point in time. As shown in Figure 1, fishery sub-sector is the least financed by the ACGSF, which shows lesser importance attached to sustainable increase in fish production by the Nigerian Government. It is equally important to state that failure to increase value of loan that goes to fishery sub-sector is an invitation for international communities to flood Nigerian markets with both healthy and unhealthy fishes, which could have health implication on its citizens.

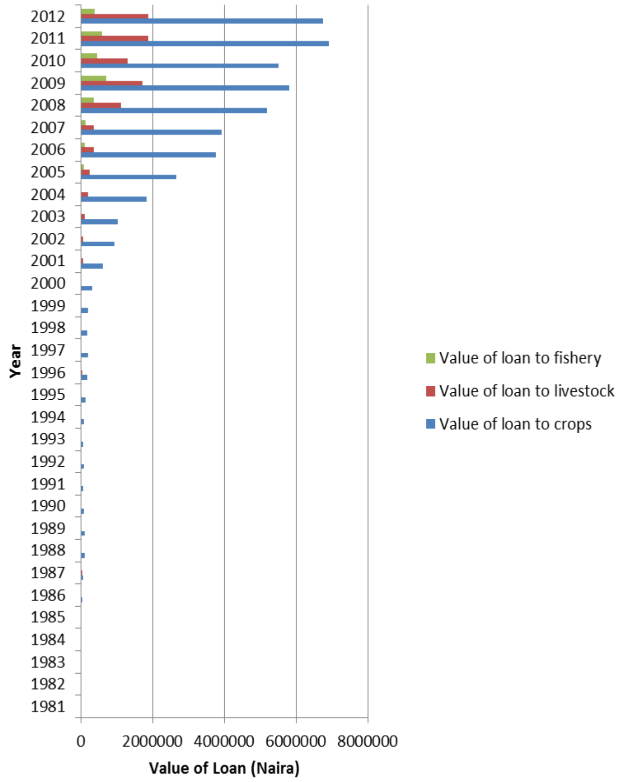

Fig. 1. ACGSF Loan Allocation in Agricultural Sector Between 1981-2012
Source: Computed from Central Bank of Nigeria (CBN) Data of Various Years.

Growth Rate of GDP from Fishery and Proportion of GDP from Fishery to Agriculture

Table 1 shows growth rate of GDP from fishery and proportion of GDP from fishery to agriculture considering two periods (1981-1999 and 2000-2012). GDP from fishery and proportion of GDP from fishery to agriculture had positive growth rate of 17.8% and 0.1% respectively in 2000-2012 while in 1981-1999, GDP from fishery and proportion of GDP from fishery to agriculture had positive and negative growth rate of 29.6% and 1.8% respectively. Considering 1981-2012, GDP from fishery and proportion of GDP from fishery to agriculture had positive growth rate of 10.63% and 0.005% respectively.

Table 1. Estimated Equation for Fishery Contribution to GDP and Growth Rates

Variable/Period	Coefficient	T-value	R^2	Growth Rate (%)
2000-2012				
GDP from Fishery	0.164***	27.998	98.6	17.8
Proportion of GDP from Fishery to Agriculture	0.001	0.206	0.4	0.1
1981-1999				
GDP from Fishery	0.259***	15.108	93.1	29.6
Proportion of GDP from Fishery to Agriculture	-0.018	-1.479	11.4	-1.8
1981-2012				
GDP from Fishery	0.101***	32.443	97.2	10.63
Proportion of GDP from Fishery to Agriculture	5.121E-5	0.244	2.2	0.005

Source: Computed from Central Bank of Nigeria (CBN) Data of Various Years.

Low growth rate recorded by the proportion of GDP from fishery to agriculture testified to the fact that fishery sub-sector is not given required attention as it is in other sub-sectors of Agricultural sector.

The growth rate of GDP from fishery in 1981-1999 was greater than that of 2000-2012 despite the fact that the scheme was operating with larger fund in 2000-2012. One of the reasons for this scenario could be that fishery sub-sector did not receive proportionate volume of fund with respect to increase in fund being used by the scheme in 2000-2012. This is another evidence that fishery sub-sector has not been well financed by ACGSF in Nigeria. Also, the growth rate of proportion of GDP from fishery to agriculture in 2000-2012 was greater than that of 1981-1999. However, this little difference in growth rate cannot be compared with the huge difference in funds available for use by ACGSF in the two periods under consideration.

Acceleration, Deceleration or Stagnation in the Movement in Growth Rates of GDP from Fishery and Proportion of GDP from Fishery to Agriculture in 1981-1999 and 2000-2012

Quadratic equations were estimated in time variables to determine whether there was acceleration, deceleration or stagnation in the movement in growth rates of GDP from Fishery and Proportion of GDP from Fishery to Agriculture in the two periods. Table 2 shows that the coefficients of t^2 for GDP from Fishery and Proportion of GDP from Fishery to Agriculture in 2000-2012 were negatively significant at 1% and 5% respectively indicating deceleration in the growth of GDP from Fishery and Proportion of GDP from Fishery to Agriculture. This has further shown that fishery sub-sector was inadequately financed in 2000-2012 even when there was increase in the funds being used by ACGSF. On the contrary, the coefficient of t^2 for GDP from fishery was positively significant at 1% confirming acceleration in the growth of GDP from fishery in 1981-1999 when smaller amount of fund was being used by ACGSF.

Table 2. Estimated Quadratic Equations for Fishery Contribution to GDP

Variables/Period	b_1	b_2	R^2
2000-2012			
GDP from Fishery	0.239*** (22.359)	-0.005*** (-7.217)	99.8
Proportion of GDP from Fishery to Agriculture	0.019** (2.389)	-0.001** (-2.514)	39.0
1981-1999			
GDP from Fishery	0.056 (1.048)	0.010*** (3.938)	96.5
Proportion of GDP from Fishery to Agriculture	-0.114** (-2.354)	0.005** (2.030)	29.6

Figures in parenthesis represent t-value. *** = 1% Significant Level, ** = 5%

Source: Computed from Central Bank of Nigeria (CBN) Data of Various Years.

In the case of Proportion of GDP from Fishery to Agriculture, the coefficient of t^2 was positively significant at 5% suggesting acceleration in the growth in 1981-1999. This implies that the impact of ACGSF was positively felt by fishery sub-sector in 1981-1999 when smaller funds were being used by the scheme.

Unit Root Test Analysis

As stated by [27], it is necessary to carry out unit root tests in order to ensure that the assumption of ARDL stated by [33] is not infringed in spite of the fact that ARDL co-integration technique does not require pre-testing of variables included in the empirical model for the order of integration. The standard Augmented Dickey-Fuller (ADF) unit root test was employed to check the order of integration of the variables used in the analysis. As shown in Table 3, the ADF test statistic revealed that GDP from fishery subsector (GDPF) and volume of ACGSF loan to fishery (VLF) were stationary at level I(0) and first difference I(1), while number of ACGSF loan to fishery (NLF), volume of ACGSF loan to agriculture (VLA) and number of ACGSF loan to agriculture (NLA) were stationary at first difference I(1). The combination of I(0) and I(1)can be used under ARDL unlike Johansen procedure and this is the justification for using bounds test approach in this study.

Table 3. Results of Unit Root (ADF) Test

Variable	Level [I(0)]		First Differences [I(1)]	
	Constant	Constant and Trend	Constant	Constant and Trend
lnGDPF	-5.761(6)***	-4.214(2)	-7.368(5)***	-7.371 (5)***
lnVLF	-6.272(0)***	-6.697 (0)***	-6.171(0)***	-6.588(0)***
lnNLF	-3.503(4)	-3.681 (3)	-5.797(0)***	-6.222 (0)***
lnVLA	-2.467(0)	-2.897(0)	-5.030(0)***	-5.017(0)***
lnNLA	-3.022(0)	-3.555(0)	-5.819(1)***	-7.266(1)***

Source: Computed from Central Bank of Nigeria (CBN) Data of Various Years.

Notes:

***, imply significance at 1% level respectively.

The figures in parentheses for the ADF (Dickey-Fuller, 1979) statistic represents the lag length of the dependent variable used to obtain white noise residuals. The lag length for the ADF was selected using Automatic-based on AIC, max lag = 7

The values in parenthesis is the lag value.

Co-integration Test Based on ARDL Bounds Testing Approach

The F-statistic tests the joint null hypothesis that the coefficients of the lagged level variables are zero (i.e. no long-run relationship exists between the variables in question). The F-statistic was estimated using Wald Test of coefficients in the ARDL-OLS regressions. As indicated in Table 4, the value of calculated F-statistic for lnGDPF (lnGDP | lnVLF, lnNLF, lnVLA, lnNLA) is 7.33 which is higher than the upper bound critical value of 4.37 at the 1% level. Therefore, the null hypothesis of no co-integration was rejected which indicates that there is a long-run co-integration relationship among the variables under consideration. The result of this study is in conformity with the findings of [12] and [13] who reported a long run association between non-oil export and the ACGSF schemes, and Agricultural Sector Output Percentage to Gross Domestic Product (ASOGDP), ACGSF and Commercial Bank Credit to Agricultural Sector (CBCA) respectively in Nigeria.

Table 4. Results of Co-integration Test Based on ARDL Bounds Test Approach

Critical Value	Critical value Bounds of the F-statistic	
	Lower bound I(0)	Upper bound I(1)
1%	3.29	4.37
5%	2.56	3.49
10%	2.20	3.09

Computed F – Statistic: F_{lnGDPF}(lnGDP | lnVLF, lnNLF, lnVLA, lnNLA) = 7.33
Note: Critical Values are cited from Pesaran *et al.* (2001), Table CI (iii), Case 111: Unrestricted intercept and no trend, Number of regressors (K) = 4.

Results of Long Run Analysis

The long run coefficients of ARDL (1,4,1,4,1) as presented in Table 5 revealed that number of ACGSF loan to fishery subsector and volume of ACGSF loan to agriculture had positive and significant influence on Gross Domestic Product from fishery subsector in the long run, while volume of ACGSF loan to fishery had negative but significant influence on Gross Domestic Product from fishery subsector in the long run. This implies that 1% increase in number of ACGSF loan to fishery subsector and volume of ACGSF loan to agriculture would lead to 0.63% and 0.98% increase in Gross Domestic Product from Fishery subsector respectively. The outcome of this study supports the findings of [12] who stated that ACGSF positively influenced non-oil export value of Nigeria. However, the negative relationship that existed between GDP from fishery and volume of ACGSF loan to fishery could be attributed to diversion of funds allocated to the sub-sector to another sub-sector or non-productive activities. This could be possible because of inadequate monitoring of the funds allocated by the ACGSF.

Table 5. Estimated Long Run Coefficients Using ARDL Approach

Regressor	Coefficient	Standard Error	T-ratio
lnNLA	-0.3298	0.2510	-1.31
lnNLF	0.6305***	0.1334	4.73
lnVLA	0.9827***	0.3565	2.76
lnVLF	-0.6535***	0.1984	-3.29
C	-1.6144	1.2206	-1.32

Note: ***, significant at 1%
ARDL(1,4,1,4,1) selected based on Schwarz Bayesian Criterion.

Results of Short Run Analysis

The analysis of Error Correction Model (ECM) based on ARDL bounds test approach was used to obtain the short run dynamic coefficients associated with the long-run co-integration relationships. The results of the short run coefficients of ARDL (1,4,1,4,1) model are presented in Table 6. The outcome of the short run interactions is similar to the long run relationship in terms of sign of the coefficients. This shows that similar reasons given for the long run relationship might be responsible for the results of short run interactions. The statistically significant negative coefficient of ECM(-1) verified the long run relationship among the variables under consideration. According to [34], ECM measures how quickly the endogenous variable adjusts to the changes in the independent variables before the endogenous variable converges to the equilibrium level. Negative and statistically significant ECM demonstrates that adjustment process is effective in restoring equilibrium. Negative and low ECM in absolute value points out a slow adjustment. It is, therefore, crystal clear that ECM in this study is statistically significant at 1% level and had a value of -0.3412. The implication of this is that about 34.1% of disequilibria from the previous year's shock converge to the long-run equilibrium in the current year.

Table 6. Results of the ARDL Short-run Relationship

	Coefficient	Standard Error	T-value
ΔlnNLA	-0.1254	0.0765	-1.64
ΔlnNLF	0.2016***	0.0628	3.21
ΔlnVLA	0.4668***	0.1386	3.37
ΔlnVLF	-0.1303**	0.0631	-2.06
ecm(-1)	-0.3501	0.0443	-7.89

R-Squared = 0.39134, R-Bar-Squared = 0.20610, S.E. of Regression = 0.20006, F-stat. F(5, 25) = 2.9576 [0.031], Residual Sum of Squares = 0.09472 Equation Log-likelihood = 10.5222 , DW-statistic = 2.0743

Note: **,***, significant at 5%, 1% respectively.

Results of ARDL Diagnostic Tests

The outcome of the tests as shown in Table 7 revealed that the F-test failed to reject the null hypotheses of no serial correlation, homoscedasticity and normal distribution at 5% significant level. Furthermore, stability tests using the cummulative sum of recursive residuals (CUSUM) and cummulative sum of squares of recursive residuals (CUSUMq) plots as indicated in Fig. 2 and 3 respectively, show that the model coefficients are stable in both the short run and long run.

Table 7. Results of Diagnostic Tests

Test	χ^2 statistic	Probability
Serial Correlation Test	2.9841	0.225
Heteroskedasticity	9.9616	0.822
Normality	0.2899	0.865

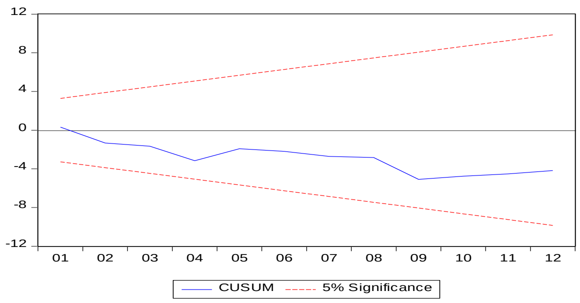

Fig. 2. Plot of the Cumulative Sum of Recursive Residuals (CUSUM) Tests for ARDL Model:

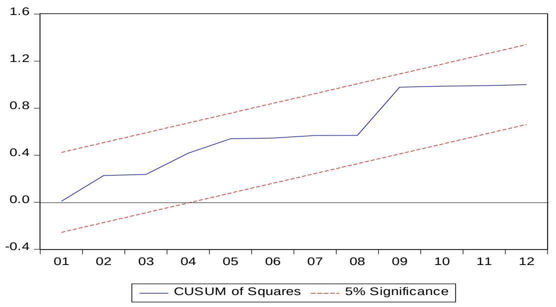

Fig. 3. Cumulative Sum of Recursive Residuals of Square (CUSUMq) Tests for ARDL Model

CONCLUSIONS

It can be concluded that fishery sub-sector is the least financed in the Agricultural sector by Agricultural Credit Guarantee Scheme Fund (ACGSF) which manifested in the contribution of fishery sub-sector to Gross Domestic Product (GDP) between 1981 and 2012. Also, the growth rate for GDP contribution from fishery in 1981-1999 was more than that of 2000-2012 when ACGSF was operating with larger funds. In the long run, the number of ACGSF loan to fishery subsector and volume of ACGSF loan to agriculture had positive and significant influence on GDP from fishery subsector, while volume of ACGSF loan to fishery had negative but significant influence on Gross Domestic Product from fishery subsector. Also, the outcome of the short run interactions is similar to the long run relationship in relation to the sign of the coefficients. The ECM is statistically significant at 1% level with the value of -0.3412, indicating that there is a slow adjustment process in restoring equilibrium.

Therefore, it is recommended that volume of ACGSF loan devoted to agricultural sector and especially fishery sub-sector should be significantly increased if sustainable development will be recorded in the sub-sector. Also, the negative sign exhibited by volume of ACGSF loan to fishery could be a sign of fund diversion from the subsector to another subsector or non-productive activities. It is therefore imperative that adequate monitoring and evaluation policy measure is put in place. This will go a long way in curbing diversion and poor management of ACGSF loan in fishery subsector.

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