

## ANALYSIS OF SUPPLY STRUCTURE AND TRENDS OF FORMAL FUNDING OF AGRICULTURE IN NIGERIA (1992-2012)

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### Abstract

*This study analyzed supply structure and trends of formal funding of agriculture in Nigeria. Time series data, covering the period 1992 to 2012 collected from Statistical Bulletin of Central Bank of Nigeria was used in the analyses. The data collected was analyzed using descriptive statistics and trend analysis. Issues addressed included formal credit supply structure and trends of supply of loans to agriculture in Nigeria. Results showed that structure of formal loan Supplies to agricultural production in Nigeria was one of dominance in number and values of guaranteed loans to individual farmers than to corporate farms. The trend in value of loans allocated to food crop within the period under review was increasing, consistent and positive. The trend in value of loans allocated to cash crops however fluctuated. More funds should be allocated to agriculture through the Agricultural Credit Guarantee Scheme Funds by Central Bank of Nigeria to enable the scheme expand its services to other farm enterprises (such as apiculture, heliculture, grass cutter rearing and mixed farming) and increase volume of loans to medium and large scale farmers.*

**Key words:** supply structure, agricultural financing, credit, Nigeria

### INTRODUCTION

Emergence of crude oil as a major source of foreign exchange earner and revenue to Nigeria government, had forced agricultural sector to be neglected resulting to its observed decline [12,13,24]. Neglect of the sector is such that there has not been reliable and effective clear cut formal national finance structure policy directing flow of formal credit to the sector. What had existed is concessionary consideration of finance to the sector, which has not placed the sector in any strong commercial competitive setting as subsidized lending programmes to farmers have succeeded in obstructing development of a sustainable rural banking in Africa [14].

Agricultural sector in Nigeria has great potential to generate employment opportunities, alleviate food insecurity, encourage agro-industrialization and improve entrepreneurship through capacity building and is looked upon to generate required economic growth. The realization of this fact led successive Nigerian governments to embark on several agricultural development

programmes, many of which, unfortunately, failed [15,18]. These programmes include National Accelerated Food Production Programme (NAFPP) in 1972, Operation Feed the Nation (OFN) in 1976, Green Revolution (GR) in 1980 and Agricultural Transformation in 2011.

To sustain these programmes and diversify her oil-based economy, Nigeria placed emphasis on financing of her agricultural sector by increasing flow of credit to the sector [2]. Formal financial institutions have been induced by moral suasion and correction to extend a minimum prescribed percentage generation of their loanable funds at concessionary interest to agriculture. Financing Agricultural sector remains one important instrument for economic policy for Nigeria, in her effort to stimulate growth and development in all sectors

[19] was able to chart the trend of supply of agricultural credit in Nigeria from 1978 to 2009 comparing effects of price reform policies on access to institutional credit to the sector before and after the reforms (1978 - 1985; and 1986 -2009). The lending to

agricultural sector in Nigeria during post financial reform era was trending upwards, relative to the sluggish and almost stagnant trend in the pre-reform era. This suggests that the financial sector reforms were paying off after all since its multiplier effects filtered through the sector engineering growth and development. To sustain the growth impact or positive real growth pattern induced by credit supply to the sector, the need to improve on policy variables inducing such becomes quite obvious.

[3] observed that robust economic growth can only be achieved by putting in place well focused programmes to enhance farm credit supplies and reduce poverty by empowering farmers through increasing their access to farm credit. Good implementation of such credit outreach Programmes will only be assured when executors have grip of correct knowledge of current structure and conduct of credit to agricultural production in the country.

In light of the foregoing this addressed the following: (i) describing supply structure and conduct of funds to agricultural production in Nigeria from 1992 to 2012; (ii) classifying and analyzing funds (credit) supplied to agriculture by sectors viz trend in credit from formal sources to food and cash crop production in Nigeria from 1992 to 2012; (iii) estimate growth rate of formal credit disbursement to agriculture within the period under review.

## MATERIALS AND METHODS

### Study Area

The study was carried out in Federal Republic of Nigeria. Nigeria. This country is located in West Africa covering a geographical area of 923,768 square kilometers and is bounded on the south by Gulf of Guinea, on the West and North by Republics of Benin and Niger, on the east by Republic of Cameroon. The country is located between latitudes  $4^{\circ} 02'N$  and  $14^{\circ} 03'N$  (south of Lake Chad) and longitudes  $2^{\circ} 59' E$  and  $15^{\circ} 02' East$  of the Greenwich Meridian covering a geographical area of 923,758 square kilometers. The population consists of 140, 003,542million

people [17]. Nigeria has a land area of 98.3 million hectares, of which 71.2 million hectares are cultivable. However, only 34.2 million hectares (about 48 per cent of the cultivable area) are actually being cultivated, and less than 1 per cent of the arable land is irrigated [10,16].

The climate is semi-arid in the north and becomes increasingly humid in the south, with mean annual temperature ranging from  $28^{\circ}C$  to  $31^{\circ}C$  in the south. Rainfall is one of the important climatic factors influencing agriculture and three broad ecological zones rainfall pattern are commonly distinguished: the northern Sudan savannah (500 – 1,000 mm), the guinea savannah zone or middle belt (1,000 – 1,500mm) and the southern rainforest zone (1,500– 4,500mm). Generally, rainfall patterns are marked by an alternation of wet and dry seasons of varying duration. In the north, rainfall lasts from May to September with a peak in August, while in the south, rainfall is bimodal, increasing steadily from March and reaching its peak in September. About two thirds of the cropped area is located in the north with the rest equally divided between the middle and southern zones [1].

The average population density of 118 persons per square kilometre masks the disparity that exists between the densely populated South west and South east of Nigeria, where much of the urban population live and the less concentrated north. The economy is characterized by a large rural population, mostly agricultural based traditional sector and relatively smaller urban, and more capital intensive sector. The average per capita income (estimated by the World Bank in 2006) was US\$300 per annum [7]. Agriculture is the largest single sector of the economy, providing employment for a significant segment of the work force and constituting the mainstay of the country's large rural community, which accounts for nearly two-thirds of the population. The proportion of the Gross Domestic Product (GDP) attributable to agriculture hovered between 30.0% and 40.0%, well ahead of mining and quarrying, as well as wholesale and retail trade, which are the other two major

contributors to the country's GDP [9]. A large proportion (89.06% ) of the total agricultural production was accounted for by rain fed crop production while livestock, forestry and fisheries contributed 6.38 per cent, 1.25 percent and 3.31 per cent respectively [7].

**Data Collection**

Data for this study was culled from secondary sources. The data provided information covering the period 1992-2012 and was gathered from various issues of annual reports and statement of account of Central bank of Nigeria and other relevant financial data in statistical bulletins of local and international agencies.

**Data Analysis**

To realize the objectives of this study, a number of statistical tools were employed in analyzing the obtained data. Descriptive statistical tools such as frequency tables and percentages were partly used to analyze objectives (i) and (ii). The data was further subjected to trend analysis to realize part of objective (ii).

**Model specification**

The linear trend equation for estimating agricultural growth was specified in line with [11] as:

$$\text{Ln}Q_t = a + bt + U_t \dots\dots\dots(1)$$

where:

$Q_t$  = Credit disbursed to food and cash crop producers by formal institutions during period under review (t);

$a$  = constant of the regression line;

$b$  = parameter estimate of the absolute increase in fund disbursed to food and cash crop;

$U$  = error term;

$\text{Ln}$  = natural logarithm.

For measuring acceleration or deceleration in the growth rate, log quadratic trend equation was fitted in line according to [21, 22] and stated thus:

$$\text{Ln}Q_t = a + bt + ct^2 + U_t \dots\dots\dots (2)$$

A positive significant value of  $c$  indicates acceleration while a negative significant value implies

a deceleration. A non – significant value shows stagnation in the growth process.

The compound growth rate equation is given as follows:

$$r = (eb - 1) \times 100 \dots\dots\dots (3)$$

where  $e$  is Euler's exponential constant (2.71828). Most of the time series variables are non--stationary and we checked for stability in unit-root of the variables using the most recommended tests of Augmented Dickey---Fuller (ADF) test and the Phillips-Perron (P-P) test.

**RESULTS AND DISCUSSIONS**

**Supply Structure and Conduct of Credit to Agricultural production in Nigeria (1992-2012).**

The number and value of loans guaranteed to farmer users' over the period (1992-2012) in Nigeria are shown in Tables 1 and 2 respectively. Table 1.0 showed that annual number of loans ranged from 12,859 in 1999 to 56,328 in 2011. During the year of lowest number of disbursement (1999) the proportions of target disbursements were: 96.73% to individual farmers; 0.08% to informal groups; 2.81% to cooperative societies; and 0.38% to corporate groups respectively. During the year of highest number of disbursement (2011) the proportions of target disbursements were: 95.52% to individual farmers; 3.17% to informal groups; 1.20% to cooperative societies; and 0.00% to corporate groups respectively. Loans to individual farmers dominated in number. This revealed that in Nigerian agricultural sector, farmers who operated as small and medium scale individual units were most attended to in disbursement of formal farm credit; the next attended were informal groups and cooperative societies; and the least were the corporate groups. This trend truly reflected dominance of smallholder farm units producing bulk of locally consumed foods and remaining center-piece of Nigerian agriculture [8,23].

The cumulative annual percentage of number of loan beneficiaries (cooperative societies, informal groups and corporate units) was low over the years compared to that to individual farmers (Table 1).

Table 1. Total number of loans to agriculture by category of users in Nigeria (1992-2012)

Year	Total number of loans	% Total No. of Loans to individuals	% Total No. of Loans to informal Group	% No. of Total loans to Cooperatives	% Total No. of loans to Company	Total
1992	21,206	99.25	0.00	0.65	0.10	100
1993	15,514	98.81	0.00	1.10	0.09	100
1994	16,572	98.93	0.00	0.88	0.19	100
1995	18,079	98.73	0.00	1.14	0.13	100
1996	19,036	98.22	0.00	1.68	0.10	100
1997	17,840	96.68	0.13	2.98	0.20	100
1998	14,637	98.94	0.11	0.53	0.42	100
1999	12,859	96.73	0.08	2.81	0.38	100
2000	14,102	98.39	0.47	1.0	0.09	100
2001	20,298	99.99	0.00	0.00	0.00	100
2002	23,681	99.35	0.34	0.30	0.02	100
2003	24,303	98.57	0.96	0.46	0.01	100
2004	35,035	99.65	0.20	0.13	0.02	100
2005	46,238	99.04	0.64	0.31	0.01	100
2006	54,032	93.61	1.83	4.55	0.02	100
2007	43,233	95.00	4.88	0.10	0.01	100
2008	52,787	95.92	3.19	0.83	0.06	100
2009	53,639	92.40	1.53	5.73	0.34	100
2010	50,849	97.15	0.99	1.74	0.12	100
2011	56,328	95.52	3.17	1.20	0.00	100
2012	48,736	96.36	1.41	1.38	0.86	100

Source: Computed from CBN statistical bulletin, (2009; 2012), [4,5]

Table 2 shows that annual total value of loans was highest with individual farmer beneficiaries also. The highest disbursed sum of ₦8,349,509,300.00 was in the year 2009 with 89.77% of it given to individual borrowers; 7.03% of it given to cooperative societies; 1.66% of it disbursed to corporate organizations and 1.54% of it given to informal groups borrowers. Likewise, the least amount of these loans ₦9,706,761.23 were given out to farmers in 2012 with 94.04% of it given to individual borrowers; 2.92% of it given to corporate organizations; 2.75% to cooperative societies and 0.29% to informal groups. Even though individuals attracted bulk of this loan to themselves, the truth remains that groups and companies had higher capacities to utilizing such loans.

**Structure of Loans Guaranteed By Size from 1992 to 2012**

The pattern of loans guaranteed by size to users’ over the period (1992-2012) in Nigeria

is shown in Table 3. Loans in the bundle of at most ₦5000.00 dominated both in number and value of the guarantees. This does not present any surprises since about 65% of farmers in Nigeria operated on small scale with small holdings.

This result is in consonance with [20] that Agriculture in Nigeria is characterized by large number of small-scale farmers, scattered over wide expanses of land, withholding ranging 0.05-3.0 hectares, but not more than 10 hectares per farmer, with low capital use and low yield per hectare.

Annually, the loans of size at most ₦5,000.00 guaranteed over the period, were for farmers that ranged from 25 in 2010 to a maximum 20,185 farmers in 1992. The loans that ranged from ₦5,000.00 to ₦20,000.00 guaranteed by CBN, recipients ranged from a minimum of 748 farmers in 1992 to a maximum of 14,045 farmers in 2005.

Table 2. Total value of agricultural loans by category of users in Nigeria (1992-2012)

Year	Total value of Loans (NM)	% Total value of loans to individuals	% Total value of loans to informal groups	% Total value of loans to cooperatives	% Total value of loans to companies	Total
1992	88,031,800.00	85.82	0.00	7.79	6.39	100
1993	80,845,800.00	84.43	0.00	11.19	4.38	100
1994	103,186,000.00	83.78	0.00	8.72	7.50	100
1995	164,162,100.00	80.88	0.00	11.75	7.37	100
1996	225,502,500.00	79.74	0.00	15.27	4.99	100
1997	242,038,200.00	76.30	3.11	14.20	6.39	100
1998	215,697,200.00	88.23	0.79	4.15	6.83	100
1999	246,082,500.00	78.63	0.55	17.20	3.62	100
2000	361,450,400.00	89.69	2.77	6.34	1.20	100
2001	728,545,400.00	99.92	0.00	0.01	0.07	100
2002	1,051,589,800.00	97.53	1.01	1.35	0.12	100
2003	1,164,460,400.00	95.02	2.64	1.39	0.94	100
2004	2,083,744,700.00	96.81	1.02	1.52	0.65	100
2005	3,046,738,500.00	97.45	0.66	1.26	0.63	100
2006	4,263,060,300.00	93.47	1.94	4.03	0.55	100
2007	4,425,861,800.00	93.66	5.16	0.63	0.55	100
2008	6,721,074,600.00	91.61	4.30	2.46	1.62	100
2009	8,349,509,300.00	89.77	1.54	7.03	1.66	100
2010	7,740,507,600.00	95.23	0.55	3.23	0.99	100
2011	10,189,604.24	92.01	3.77	2.99	1.22	100
2012	9,706,761.23	94.04	0.29	2.75	2.92	100

Source: Computed from CBN statistical bulletin, (2012), [5]

Table 3. Number of loans guaranteed by size from 1992 to 2012

Year	<N5,000.00	N5,001-N20,000	N20,001-N50,000	N50,001-N100,000	>N100,000
1992	20,185	748	176	75	22
1993	14,255	961	175	110	13
1994	14,675	1,445	261	164	27
1995	14,167	2,981	501	356	74
1996	11,385	6,221	678	665	87
1997	8,112	7,948	927	647	206
1998	5,134	8,153	627	650	73
1999	2,596	8,379	1,152	586	146
2000	226	9,407	3,687	530	252
2001	529	8,828	8,193	2,244	504
2002	185	7,276	10,536	4,062	1,622
2003	280	9,848	7,904	4,776	1,495
2004	317	10,433	12,776	7,320	4,189
2005	85	14,045	16,346	8,749	7,013
2006	150	9,314	22,482	12,993	9,093
2007	26	3,186	15,334	13,133	11,554
2008	58	1,751	23,180	12,701	15,097
2009	28	5,707	16,674	11,823	19,407
2010	25	4,075	16,061	13,029	17,659
2011	50	4,540	13,957	14,395	23,386
2012	193	5,961	9,957	10,586	22,039

Source: Development Finance Department, Central Bank of Nigeria (2013), [6]

A minimum of 175 farmers in 1993 had loans guaranteed and a maximum of 23,180 in bundle of N20,001 to N50,000.00 farmers in 2008 had loans in the same bundle

(~~₦~~20,001-~~₦~~50,000) guaranteed.

Loans in the bundles of ~~₦~~50, 000 - ~~₦~~100,000 guaranteed by CBN within the period were given to farmers that ranged from a minimum of 75 farmers in 1992 to a maximum of 14,395 farmers in 2011.

Within the period also loans exceeding ~~₦~~100,000.00 bundles were given to a minimum of 13 farmers in 1993 and to a maximum of 23,386 farmers in 2011. The

trend revealed that the maximum bundle of loan guaranteed and given to farmers was on the increase. This increasing trend was expected because more farmers joined the loan supply schemes as the years passed by.

Table 4 showed the classification of funds supplied to Agriculture by sectors under the Agricultural Credit Guarantee Scheme Fund (ACGSF) from 1992 to 2012.

Table 4. Values of loan guaranteed by purpose to agriculture through Agricultural Credit Guarantee Scheme Fund (ACGSF) in Nigeria from 1992 to 2012 (₦000)

Year	Food crop	Livestock	Cash crop	Fishery	Mixed farming	Others	Sub-Total
1992	76,260.7	60,561	6,423.2	10,387	400	3,213.1	157,245
1993	70,252	5,505.8	2,384.9	428	0	2,703.1	812,73.8
1994	82,072.4	10,527.9	8,094.4	2,438	0	3,768.3	106,901
1995	121,068.6	18,048.5	13,499.3	1,512	1,000	11,517.7	166,646.1
1996	171,838.3	28,216.9	15,176	2,145	0	10,290.3	227,666.5
1997	187,491.8	23,404.7	13,755.5	3,554.5	0	13,822	242,028.5
1998	175,764.8	22,587.1	7,197.1	3,456	1,000	10,283.5	220,288.5
1999	204,058	11,952	4,920	6,180	205	14,524	241,839
2000	303,677	27,307	4,928	899	0	24,638	361,449
2001	605,525.7	60,415.7	17,169	15,742.2	0	29,692.8	728,545.4
2002	925,734.7	64,449.6	13,214.4	12,069.3	17,300	18,214.3	1,050,982
2003	1,015,195	100,486.4	10,961	13,050	8,333	2,990	1,151,015
2004	1,807,668	190,304	18,185	18,240	250	49,098	2,083,745
2005	8,167,102	844,882.8	154,830	262,195	15,210	49,635	9,493,854
2006	3,703,384	368,151	67,165	114,400	1,000	8,330	4,262,430
2007	3,871,443	353,487.3	42,331	140,690	0	17,510	4,425,462
2008	4,775,376	1,108,484	190,589	368,630	0	54,880.5	6,497,959
2009	5,517,229.66	1,725,801.27	2,98,967.80	708,621.24	1,2930.01	85,959.30	8,349,509
2010	5,426,428.13	1,305,432.50	84,894.00	461,128.00	62,710.00	399,915.00	7,740,508
2011	6,797,632.69	1,882,283.35	109,029.92	590,167.50	357,885.00	443,645.80	10,200,000
2012	6,353,629.86	1,878,042.97	408,654.06	378,311.89	580,767.00	107,355.45	9,706,761
Total	50,400,000	10,100,000	1,492,369	3,114,245	1,058,990	1,361,986	67,500,000
Mean	2,398,040	480,952.5	71,065.17	148,297.4	50,428.1	64,856.48	3,213,179
Standard deviation	2735802	677063.6	109030.6	221693.8	144338.5	122107.3	3798106
Minimum	70,252	5,505.8	2,384.9	428	0	2,703.1	81,273.8
Maximum	8,167,102	1,882,283	408,654.1	708,621.3	580,767	443,645.8	10,200,000

Source: Development Finance Department, Central Bank of Nigeria (2013)

The total amount Guaranteed to food crop sub sector over the period was ~~₦~~50, 400,000,000.00 with a mean of ~~₦~~2, 398,040,000.00 and a standard deviation

of ~~₦~~2,735,802,000.00. The gap in value of loans supplied: minimum ~~₦~~70, 252,000.00 (in 1993) and maximum ~~₦~~8, 167,102, 000.00 (in 2005) to food crop sector was ~~₦~~8,

096,850,000.00 and is adjudged quite large. Similarly, a total sum of ₦1,492,369,000.00 supplied as credit to cash crop sector showed an increase during the period with a mean value of ₦71,065.170. The difference between the minimum (₦2,384,900.00) disbursed in 1993 and maximum sum supplied (₦408,654,060.00) in 2012 to cash crop sector was ₦406,270,960.00 within the period under review. The total amount disbursed to livestock sector (₦10,100,000.00) during the period under review was appreciably high with a mean loan value of ₦480,492,952.5 and standard deviation of ₦677,063.600.00. The gap between the minimum (₦5,505,800) and maximum (₦1,882,283,000) value of fund supplied to livestock sector was equally large. Similar increases were also recorded in the volume of fund supplied to fishery (₦3,114,245,000) with a mean of ₦148,297,400 and other enterprises (apiculture, heliculture and grass cutter rearing) (₦1,361,986,000) with a mean of ₦64,856,480 over the period under

review. The gap between the minimum and maximum values of fund supplied to fishery (₦708,193,300) sector and other agricultural enterprise (₦440,942,700) within the period under review was equally quite large. The annual value of loans guaranteed to mixed farming over the period ranged from ₦205,000 in 1999 to ₦580,767,000.00 in 2012 with a mean of ₦50,428,100.00. The amount of fund supplied to mixed farming by the schemes showed dramatic distribution with no supplies in some years (1993, 1994, 1996, and 1997). The maximum loan of ₦580,767,000.00 was supplied in 2012 and the large values of standard deviations within the sectors showed high variability in supply of funds over the years.

**Trend in Loans Allocated to Food and Cash Crops Production in Nigeria (1992-2012)**

The trend in the value of loans allocated to food crop within (1992-2012) is shown as Figure 1.

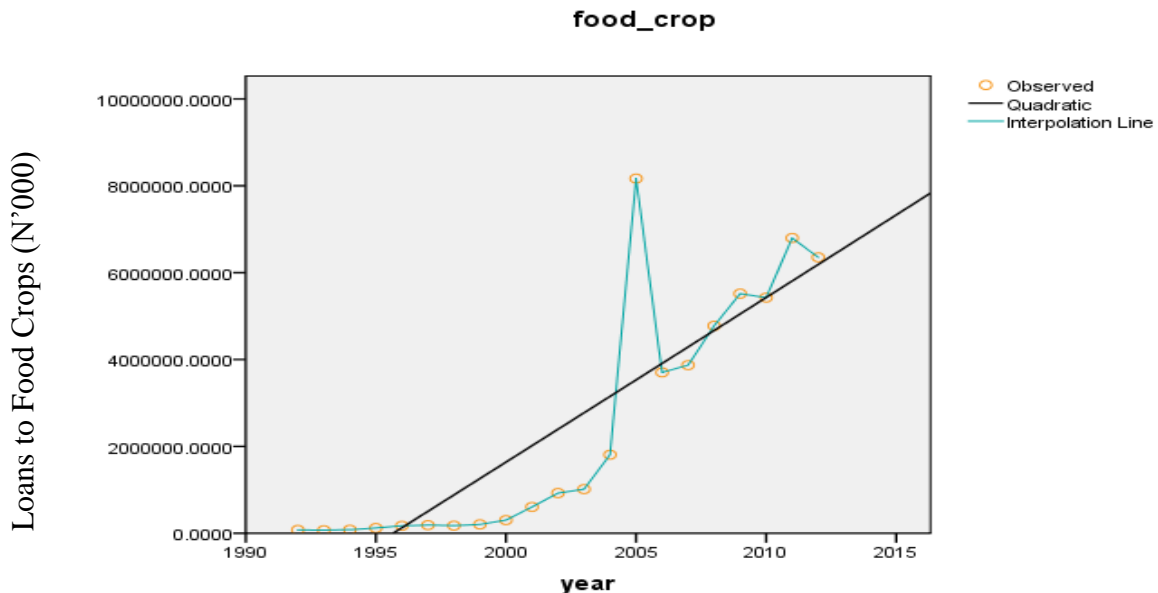


Fig.1. Trend in funds allocated to food crop sector in Nigeria from 1992-2012  
 Source: Computed from Table 4.

The figure shows the trend of funds as increasing and statistically significant. The computed R<sup>2</sup> value (0.737) of the trend line within the period (21 years) under review was significant at 1.0% alpha level of probability (Table 5). The Table shows that the lowest fund allocated to food crop (₦70,252,000.00)

was in the year 1993 with persistent higher funds below ₦2.0 billion allocated to the sub-sector from 2000 to 2004 and a sharp increase in loans to ₦8.67 billion in the year 2005 dropping again to ₦3.7 billion in the year 2006.

Table 5. Model Summary/parameter estimates of loan trend for food crop production in Nigeria.

Equation	R Square	Model Summary			Parameter Estimates		
		F	df	Sig.	Constant	b <sub>1</sub>	b <sub>2</sub>
Quadratic	0.737	53.171	1	.000	-3.764E8	.000	94.518

Source: Computed from Table 4.

Thus from 2006 to 2011 loans disbursed to food crop increased from ₦3.7 billion to ₦6.8 billion. Increments were on account of government policies aimed at improving food crop production in Nigeria.

The result of the trend analysis of funds supplied to cash crop production in Nigeria within the period under study is shown as Figure 2. The figure shows that the trend of funds allocated to cash crop production in Nigeria within the period had a significant positive trend with dramatic swings. Funds

allocated to cash crop showed a series of non-consistent values with a zigzagged pattern. The lowest fund allocated to cash crops (₦2,384,900.00) was observed in the year 1993. There were relatively higher values of funds allocated to cash crop: ₦298,967,800.00 in 2009 and 2012; with a sharp drop to ₦84,890,000.00 in 2010.

The computed R<sup>2</sup> value (0.493) within the period was significant at 1.0% alpha level as was the case for food crops (Table 6).

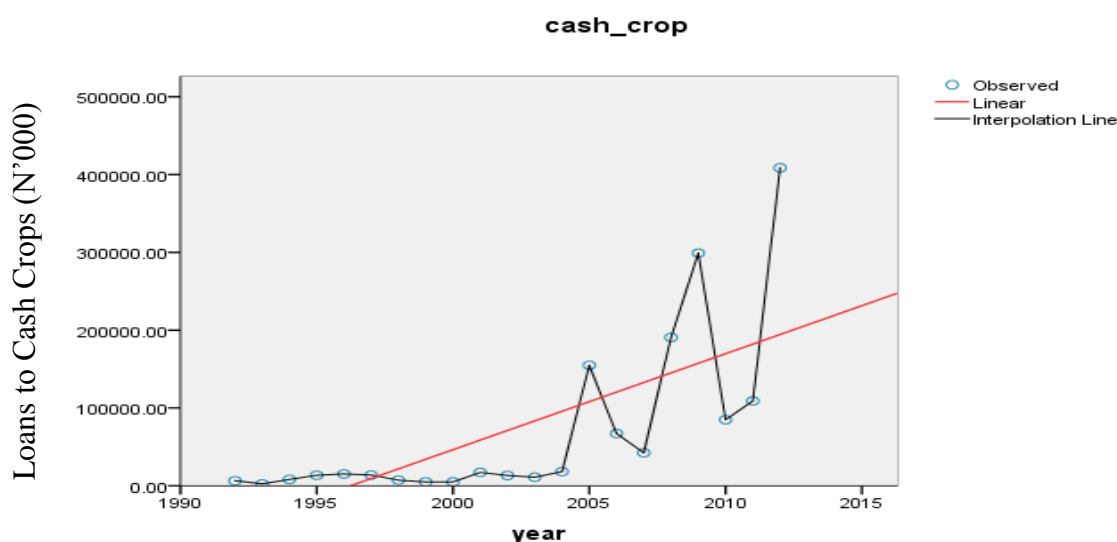


Fig. 2. Trend in funds allocated to cash crop sector in Nigeria from 1992-2012

Source: Computed from Table 4.

Table 6. Model summary/parameter estimates of loan trend for cash crop production in Nigeria

Equation	Model Summary					Parameter Estimates	
	R Square	F	df1	df2	Sig.	Constant	b <sub>1</sub>
Linear	0.493	18.474	1	19	0.000	-2.463E7	1.234E4

Source: Computed from Table 4.

## CONCLUSIONS

The empirical evidence from both descriptive and inferential statistics employed showed that there was increasing trend in size of loans guaranteed to agricultural sector from 1992 – 2012. The annual total value was highest with loans to individuals than with loans to

corporate units.

Loan supplied to the food crop sub-sector was persistently increasing in trend. Loans to cash crop sub-sector fluctuated within the period under review. The Agricultural Credit Guaranteed Scheme was very effective in supplying credit to farmers (individuals and corporate farm units) in Nigeria.



The following recommendation suffices based on findings:

More funds should be allocated by Nigerian Government to farmers through the ACGSF. This will enable the scheme to expand its services (giving more loans) to other farm enterprises (such as apiculture, heliculture, grasscutter and mixed farming).

The formal lending institutions should increase the number and amount of loans disbursed to cooperative societies since loans to such organized groups can be easily managed with the effects of group pressure

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