AN EVALUATION OF NATIONAL FUNDING AND INVESTMENT IN
THE AGRICULTURAL SECTOR OF NIGERIA (1970-2008)

BY

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PG/Ph.D/00/28711

DEPARTMENT OF AGRICULTURAL ECONOMICS
UNIVERSITY OF NIGERIA NSUKKA

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IN THE AGRICULTURAL SECTOR OF NIGERIA (1970-2008)

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BY

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CERTIFICATION

Anthony Kingsley Ogbonna Nnadozie,a post graduate student in the Department of Agricultural Economics and with the Registration Number, PG/Ph.D/00/28711 has satisfactorily completed the requirements for the award of Doctor of Philosophy (Ph.D) Degree in Agricultural Economics, with options in Agricultural Finance and Project Analysis.

The work embodied in the Ph.D Research Thesis is original and has not been presented before in any previous application for a higher degree or diploma of this or any other university or any reputable presentation elsewhere in part or full. This thesis meets the regulations governing the award of the Degree of Doctor of Philosophy, University of Nigeria ,Nsukka, and is approved for its contribution to scientific knowledge and literary presentation.

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DEDICATION

This thesis is dedicated to the memory of the following, Late Chief Mrs. Nnadozie Esther Ogoro, and Late Prof. Ethelbert C. Nwagbo.

ACKNOWLEDGEMENT

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DEFINITION OF TERMS/ACRONYMS

ACGSF	-	Agricultural Credit Guarantee Scheme Fund
ACSS	-	Agricultural Credit Support Scheme
ADB	-	African Development Bank
ADP	-	Agricultural Development Programme
ADF	-	Augmented Dick fuller Test
APMEU	-	Agricultural Projects Monitoring and Evaluation Unit
CSAC	-	Comprehensive Strategy to Improve Agricultural Capacity
CAADP	-	Comprehensive African Agricultural Development Programme
CADEP	-	Commercial Agricultural Development Programme
CBN	-	Central Bank of Nigeria
CBOs	-	Community Based Organizations
CIA	-	Central Intelligence Agency (US)
DFID	-	Department of Foreign and International Development
DFRRI	-	Directorate of foods, Roads and Rural Infrastructure
ECM	-	Error Correction Model
ECOWAS	-	Economic Community of West African States
FAAP	-	Framework for African Agriculture and Productivity
FACU	-	Federal Agricultural Co-ordinating Unit
FAO	-	Food and Agricultural Organization of the United Nations
FAOSTAT	-	Food and Agricultural Organisation Statistical Year Book
FEAP	-	Family Economic Advancement Programme
FCT	-	Federal Capital Territory
IFPRI	-	International Food Policy Research Institute
ILO	-	International Labour Organisation
FGN	-	Federal Government of Nigeria
FMARD	-	Federal Ministry of Agriculture and Rural Development
GDP	-	Gross Domestic Product
GNP	-	Gross National Product
GNS	-	Gross Domestic Savings
IFAD	-	International Fund for Agricultural Development
MDGs	-	Millennium Development Goals
MEC	-	Marginal Efficiency of Capital
MT	-	Metric Tonnes
MTEF	-	Medium Term Expenditure Framework
NBS	-	National Bureau of Statistics
NACB	-	Nigerian Agricultural Cooperative Bank
NACRDB	-	Nigerian Agricultural Credit and Rural Development Bank now Agricultural Bank.
NAFCON	-	National Fertilizer Company of Nigeria
NALDA	-	National Agricultural Land Development Authority
NAPEP	-	National Poverty Eradication Programme
NARIS	-	National Agricultural Research Institute
NDE	-	National Directorate for Employment
NEEDs	-	National Economic Empowerment Development Strategy
NEPAD	-	New Economic Partnership for African Development
NISER	-	National Institute for Social and Economic Research
NPC	-	National Population Commission
NPFS	-	National Programme for Food Security
NSPFS	-	National Special Programme on Food Security
OLS	-	Ordinary Least Square

OFN	-	Operation Feed the Nation
PCU	-	Programme Coordinating Unit now national food reserve agency.
PMA	-	Plan for Modernization of Agriculture
R & D	-	Research and Development
ROI	-	Return on Investment
S & T	-	Science and Technology
SAP	-	Structural Adjustment Programme
SEEDs	-	State Economic Employment Development Strategies
SMEEIS	-	Small and Medium Enterprise Equity Investment Scheme
SME	-	Small and Medium Enterprises
SMEDAN	-	Small and Medium Enterprise Development Agency of Nigeria
TFP	-	Total Factor Productivity
T&V	-	Training and Visit
UNECA	-	United Nations Economic Commission for Africa
USDA	-	United States Department of Agriculture
WB	-	World Bank

ABSTRACT

The research study evaluated National funding and investment in the agricultural sector of Nigeria (1970-2008). Information was gathered from secondary data and analyzed to evaluate fund allocations to Nigerian economic sectors and agriculture from 1970 to 2008, determine difference in budgetary allocations to Nigerian economic sectors and agriculture, examine the effect of National funding and investment in agriculture on agricultural production óGDP and different economic regimes (pre and post SAP) on agriculture GDP rates, identify the implementation constraints to National funding and investment in Nigerian agricultural sector. A simple random sampling was employed to select 2 statesø ADPs from each of the 6 geo-political zones that served as source of constraints analyzed in the study. Time series (secondary) data obtained from CBN and NBS publications were used for analysis. The data collected were analyzed using both descriptive and inferential statistics such as means, percentages, frequency distribution tables and OLS regression model. The major findings were that budget allocations and expenditure to and by the five economic sectors of agriculture, defence, education health, and general administration differed in various years. There were variations in the budget allocations to the economic sectors and an unsteady trend in the percentage allocation to agriculture which was 11.2% in 1970-1975 period, it declined to 7% in 1976-1980, increased to 21.61%(1981-1985), declined to 18.52% in 1986 -1990, peaked 28 % in 2001-2005 and fell to 21.22% in 2006-2008.The study further revealed that the dynamic analysis of the impact of National funding and investment on agricultural GDP is acceptable. Out of the five variables, three (ADP services, fertilizer use, and amount of ACGSF) were positively and significantly correlated to the agriculture share of GDP, while two (irrigation cost and rural roads constructed) were found to have insignificant impact on agriculture share of the GDP. Result also showed that Nigeria economic regimes of SAP had a positive effect on agriculture GDP growth rates as its rate increased from 20.6 % in 1980 to 31.5% in 1990 .Subsequently, it appreciated to 35.8% and 42.1% in 2000 and 2009 respectively. Eleven constraints were identified as hindering
the implementation of National funding and investment in agriculture. Most critical constraints were financial, infrastructure, economic, technical, political, social-cultural and environmental in the 6 geo-political zones of Nigeria. The study therefore, recommended that budget allocations to agriculture should be increased to 30% target of NEPAD minimum by legislative act so that agricultural projects will be effectively implemented. Federal government should improve on human capital building on the ADP staff to increase their efficiency and agricultural output. The amount of loan granted by ACGSF to individual farmers should also be stepped-up to help create vibrant agricultural enterprises with employment opportunities to reduce the financial exclusion of the rural poor Nigerians which stunts agricultural growth and development. Federal government should also re-appraise fertilizer local production, local and state government ownership of irrigation projects policy to increase agricultural output by the public-private-partnership strategy. The study further recommends that rural feeder roads should be funded by the three tiers of government to increase rural roads density, access and evacuation of agricultural products which will reduce spoilages thereby increasing agricultural output in Nigeria.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Agriculture played a pivotal role in the history of Nigeria's economic development. Over the past several decades, agriculture has provided food, employment, foreign exchange and reduced poverty. It is the bedrock of Nigeria's economy (FGN, 2004).Nigeria is endowed with a huge expanse of arable land, as well as a large, active population that can sustain a high productive agriculture. Nigeria has a great potential to become the food basket of the West African sub-region (FAO, 2003).

Improvement in agricultural sector is a major thrust for poverty reduction. It is expected that high growth rate in agriculture will push the growth of non-faractivities as well (Gemma, 2008). Several studies have examined the impact of public spending on agriculture and rural development and showed that public spending on agriculture and education could positively contribute to the improvement of the quality of life in rural areas which is in tandem with the United Nation's Millennium Development Goal of eradication of extreme poverty and hunger (Rajkumar & Swaroop, 2002; ADB Key indicator, 2007; Eboh, 2009).

In Nigeria, the three tiers of government (federal, state and local) have overlapping but autonomous fiscal and policy jurisdictions for basic public services that directly impinge on the MDGs. In such federal setting, progress towards the MDGs will be hindered or accelerated depending on synergy and coordination of policies and service delivery across the public sectors. In particular, because Nigeria's state and local governments are closest to the grass roots in terms of providing public services, their actions or inactions could impact greatly on MDG's hence agriculture (Eboh, 2008; Okogu and Osafo-Kwaako,2008; and 2009). Nigeria's state and local governments have constitutionally been guaranteed autonomy for public spending, economic planning and sector policies (Eboh, 2009).

Oyebanji (2008) observed that most farm and agro-processing operations are carried out manually using simple hand tools. Small-holder farmers generally still do not have access to and lack knowledge about the use of improved technologies or crop,

fish, animal or food processing. The use of rudimentary processing techniques lead to reduced national capacity for food security due to massive post-harvest losses and as well as revenue from value-addition opportunities (FAO, 2004) .

Many studies attempted to link government spending to agricultural growth and poverty reduction (Elias, 1985; Fan and Pardy, 1998; Fan, Hazell and Throat, 2000).The studies found that government spending contributed to agricultural production growth and poverty reduction. Central Bank of Nigeria(2006), Eboh, Amakom and Oduh, (2006) and Eboh, (2008), reported that between 1980 - 1998, Nigeria expenditure on agriculture rose from N528.65 ($9.45) to N44,130.24 ($20.16) billion, while agriculture percentage of GDP rose in percent from 12.80 to 19.79 in the period under review (CBN, 2006).

Economic growth refers to the increase in the value of goods and services produced by an economy. It is conventionally measured as the rate of increase in Gross Domestic Product (GDP). Finance and investment aid growth and development in an economy. There is a link between growth of output, investment and savings (Nnanna, Englama and Odoko, 2004). Levine and Renelt (1992) explained the empirical relationship between investment and economic growth; and concluded that the rate of physical investment to GDP was the most important of the factors. Arrows (1962) also pioneered a work that considered the impact of human capital on growth and concluded that variations in investment performance and growth rates across countries was accounted for either explicitly or implicitly by the variation in the accumulation of human capital.

Feldstein and Harroka (1980) explained that in the long term, gross national savings and domestic investment rates show a strong positive correlation. Iyoha (1998) established a positive relationship between investment and economic growth in Nigeria, using investment ó income ratio as the explanatory variable. Using data for the 1970 ó 1994 period, Iyoha found that a 10 percent rise in investment income ratio will trigger a 3 percent increase in short run and 26 percent in the long run in per capita gross national product (GNP) respectively. Iyoha (1998) concluded that per capita GNP is highly investment elastic in Nigeria and for government to achieve its desired objectives of high economic growth and rapid development; it must pursue policies that will increase both public and private investments in her economic sectors.

The Nigerian data on investment and economic growth was analyzed by Nnanna, Englama and Odoko (2004) using the correlation technique to establish relationship between investment and growth. The result showed a weak relationship between capital

formation and economic growth. Indeed during the period 1981 ó 1986, investment and economic growth moved in opposite directions with a negative co-efficient of 0.22 or 22 percent.

This was not unexpected given that investment declined in four out of the six years (1981 ó 1986). Data for Structural Adjustment Programme (SAP) period of 1987 ó 2001 indicated that the relationship between investment and economic growth was positive, with a correlation coefficient of 0.30 or 30 percent (Nnanna, Englama & Odoko, 2004). Obadan and Odusola (2001) using the granger causality test on Nigerian data, testing the causal relationship between savings and income growth, savings and investment and economic growth. This follows that investment would increase growth or Gross Domestic Product share of agriculture in the national economy. The findings are in accordance with, that of Iyoha (1998) on the same issue, therefore, giving credence to the importance of investment in the growth process.

However, Nigeria is no longer able to produce enough food for her needs. Despite advances in science and technology, Nigeria still finds it difficult to match supply with the ever increasing demand for food ó a situation attributable mainly to uncontrolled population growth and inefficient utilization of productive resources. In an empirical study on the food problem in Nigeria, a challenge for the agricultural sector, Utomakili and Molue (1998) (using base year 1980 = 100); reported that the index of agricultural production in Nigeria declined from 34.2 to 17.2 percent between 1970 ó 1975 as oil became increasingly important in the Nigerian economy.

Ample evidence on investment climate reveals that infrastructural weakness; institutional deficiencies and regulatory bottlenecks act as disincentive to private investments and businesses. Public spending aims at eliminating these deficiencies in order to promote investments, employment and economic growth (Eboh, 1999; Collier, 2006; Malik and Teal, 2006).

A review by Federal Office of Statistics (National Bureau of Statistics, 2000) of the national savings and investment rates from 1990-1999 showed that the investment/GDP ratio/rate in percentage declined from 6.33 in 1990 to 5.40 in 1999 (Table 1.1). This implied that investable fund in Nigeria is declining relatively and calls for efficient utilization of available investment fund especially in the agricultural sector of the Nigerian economy to increase productivity

Table 1.1:   National Savings and Investment Rates, 1990 - 1999

Item	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
National Savings (₦ billions)	14.68	12.39	4.15	11.73	12.79	12.55	14.18	16.28	14.58	16.87
National Investment (₦ billion)	5.73	5.53	5.57	6.16	5.85	5.13	5.56	5.98	6.01	6.30
Savings Investment Ratio (₦ billion)	8.5	6.86	1.43	5.57	6.94	7.42	8.62	10.30	8.52	10.57
Savings/GDP Ratio (%)	16.22	13.07	4.25	11.7	12.6	12.1	13.1	14.6	12.7	14.4
Investment/GDP -Ratio (%)	6.33	5.83	5.71	6.15	5.77	4.95	5.17	5.38	5.29	5.40

Source: Federal Office of Statistics (2000).

However, the savings -investment ratio in naira which appreciated from 8.5 billion in 1990 to 10.57 billion in 1999 should be reflected in the agricultural sector. Public sector investment in the agricultural sector has a high potential for increasing farm output, income and standard of living while increasing food security and achievement level towards the millennium development goals (MDG, 2005).

1.2 Problem Statement

Most studies focused on the impact of total government expenditure and overall GDP growth in Nigeria. Very few of these studies attempted to link different types of government spending to growth, and even fewer attempted to analyze the impact of government spending at the sector level, especially agriculture (Kelly, 1997;Miller and Tsaukis, 2001).

It is difficult to obtain a clear picture of total agricultural expenditure. Budget documents as reported by Kilick (2005) have tended to be released only on a õneed to know basisö, and it is only in recent years that this has begun to change. Implementation bottlenecks still hamper effective use of resources. Ten percent of expenditure is funded through revenues outside the budget. Ministerial budgets and actual expenditures diverge significantly, reflecting frequent use of in-year budget re allocations (World Bank, 2006).

There is also no available detailed analysis on the returns to agriculture investment in most African countries, and reporting on Plan for the Modernization of Agriculture (PMA)expenditures more broadly is weak(Robinson,2006). Cooker (2008) reported that access to detailed agricultural sector expenditure data was problematic in Nigeria because information on the impact of agricultural expenditure was inadequate. This gap is sought to be reduced by this study.

Information obtained from this study will assist in evaluating and implementing new mechanism for Nigeria's funding for effective investment by the stake holders for promoting technical assistance for farmers; and support for the agricultural expansion programme while contributing to the existing body of knowledge in agricultural finance policy in Nigeria. The study will also identify implementation constraints to national funding and investment in agricultural sector in the country so as to increase effectiveness of National funding and investment to reduce poverty. The study will help in provision of data to encourage private sector involvement in agriculture under the new proposed private-public-participation.

One of the problems identified is that despite increase in both fund allocation and investment by the national government; agricultural output and percentage share of the GDP are still very low. For instance, the percentage agriculture share of the GDP for 5 years were; 3.4(2002); 2.6 (2003);4.2(2004);2.4(2005) and 1.9(2006) respectively while the budgetary allocation rose from 10.1 percent in 2002 to 16.2 percent in 2006(CBN,2006).

Again, the total output of major agricultural products did not increase appreciably. Statistically, between 1999 and 2000, the relative percentage increase was 6.1; and in the succeeding years: 2001 (0.1); 2002(4.1); 2003(7.2); 2004(6.2); 2005(6.7) but in 2006, it reduced to 3.6 Percent from the estimated 9 percent and 6.7 percent of the previous year (IFAD, 2007)

This wide gap created by the declining output of major staple agricultural products, the low agricultural share of GDP and high Nigerian population growth rate of 4.9 percent in 2006 is alarming. The inequalities have resulted to high increase in staple food costs and also forced federal government to import food to sustain the increasing population. At 2006 population of 140,003,542 Nigerians, it is expected that with a growth rate of 4.9 percent; the population estimate for 2008 was 161,608,980 and 177,834,683 for 2010 (CBN, 2006).

As shown over the years, the rate of agricultural production has stagnated and decreased; and failed to keep pace with the needs of a rapidly growing Nigerian

population. Thus, resulting to a progressive increase in import bills for food and industrial raw materials (World Bank,2008). Based on this problem, the federal government's committed increased investment in food and agricultural production has failed to drastically reduce food imports from 14.5 percent of total imports to 5 percent in 2007 as projected by National Economic Empowerment Development Strategy (NEEDS, 2005; IFAD, 2007; World Bank, 2008).

The study on Economic evaluation of National Funding and investment in the agricultural sector of Nigeria; is to find out the problems of low agricultural output, low agricultural productivity, low income and standard of living in spite of the increasing funding and investment by the National government.

1.3 Research Objectives

The broad objective of the study is to analyze national funding and investment in Nigerian agricultural sector.

The Specific Objectives are to:

i. evaluate fund allocations to Nigeria's economic sectors from 1970 to 2008;

ii. determine different in budgetary allocations to the Nigerian economic sectors and agriculture from 1970 to 2008.

iii. evaluate the effects of National funding and investment in agriculture on Nigeria agricultural share of GDP.

iv. evaluate the effects of different economic regimes (pre and post-SAP) on agricultural share of GDP rates in Nigeria.

v. identify the implementation constraints to national funding and investment in Nigerian agricultural sector

vi. make recommendations for policy based on the findings,

1.4   Study Hypotheses

Based on the specific objectives of the study, the null hypotheses tested were that;

i.   National investment and funding of agricultural sector have no significant effect on agricultural output/ agriculture share of the GDP.

ii.   There is no significant difference between the budgetary allocations to agriculture and other economic sectors.

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1.5   Justification of Study

The widening gap between population growth and food supply, the gap between the rates of funding, investment and output of the agricultural sector have necessitated this study. Over the decades, public sector investment and funding of agriculture in Nigeria has been increasing. For instance, CBN (2006) revealed that government recurrent expenditure on agriculture rose from N19.5 million in 1977 to N29.2 million in 1998 and to N18, 739.8 million in 2006. The capital expenditure of government on agriculture also increased from N32, 364.1 million in 2002 to N89, 544.9 million in 2006.

Sadly, the agriculture output share of GDP declined from 2.6% in 2003 to 1.9% in 2006, while expenditure profile rose from 10.1% in 2003 to 16.2 % (CBN, 2006). Ironically, it is also estimated that N82billion was spent on the importation of about six million tonnes of wheat, $750 million on rice, $700million on sugar and $500 million on milk and other dairy products (CBN, 2007).

Many studies have shown the strength of the growth linkage or õmultiplierö between agriculture and the economy. Models of the Kenyan economy show those multipliers from agricultural growth (Block and Timmer, 1994). In Zambia, estimates suggest that every $1 of additional farm income creates a further $1.50 of income outside agriculture (Hazell and Hojjali, 1995).

However, Fugile and Paul (2007) asserted that the Economic Research Service of US Department of Agriculture (USDA) has developed an index measure of the Total Factor Productivity (TFP) to distinguish the effect of innovation and related factors on the quota of agriculture output. In long run, growth in Total Factor Productivity (TFP) is the primary source of new wealth creation in the economy. Therefore, trends in agricultural TFP may provide an indication of the long run performance of the sector.

There are also indications that the relationship between government expenditure and economic growth has been studied in Ghana, Cameroon, Kenya and Uganda (Stephen and Lawrence, 2007). Some of the studies have looked specifically at the link between government spending and agricultural growth and poverty reduction. The review of public policy management, a joint DFID/World Bank (2007) study did not include Nigeria. It is pertinent to note that studies on the impact of public investment and funding of agriculture are scarce in Nigeria, therefore, necessitating the current

research on economic evaluation of national funding and investment in the agricultural sector of Nigeria.

1.6 Limitations to the Study;

The study is aimed at economic evaluation of public funding and investment on agriculture of Nigeria. Getting time series data from States and Local government Areas of the Nation for the period was a herculean task. The few available data are scanty and with the creation of additional states, aggregated data are not available so the option of extrapolation was not possible.

It is the ambition of the researcher to examine public investment and funding across the three tiers of government but for the dearth of time series data. The researcher therefore, relied on the national time series data to achieve the research objectives.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Public investment in the agricultural Sector is a topical issue in contemporary Nigerian political economy. An assessment of the overall performance of the country's agricultural sector in general points to the fact that it has not really played the leading role expected of it, in spite of the high degree of priority attention being accorded it in recent times and the acclaimed huge investments being pumped into it at all levels of government as shown in table 2.1.

Table 2.1 Government Expenditure From 1970-2009(Million naira)

Year	ADP 1 & 2	(a) Crop Production	(b) Livestock	(c) Forestry	(d) Fishing	(e) Fertilizer	Government Capital Expenditure on Agriculture
1970		1973	177	146.9	279.5	5281.1	696896093.8
1971		2350.7	192.1	166	324.9	6650.9	691407812.5
1972		2257.7	234	205.2	395.8	7187.5	702384375
1973		2246.2	334.1	231.9	449	8630.5	680431250
1974		2743.00	716.77	162.77	755.45	18823.1	724337500
1975	5872.92	3713.51	785.86	323.4	1050.15	21475.24	636525000
1976	6121.96	4113.19	1009.84	341.5	657.43	26655.78	812150000
1977	7401.64	5096.69	1238.62	297.97	768.36	31520.34	460900000
1978	8033.55	5033.36	1315.27	298.68	1386.24	34540.1	1163400000
1979	9213.14	5547.54	1492.51	306.79	1866.3	41974.7	2883300000
1980	10011.46	6607.26	1870.58	314.98	1218.64	49632.32	2997100000
1981	13580.32	10088	1706.81	1062.19	723.32	47619.66	2234500000
1982	15905.5	11274	2678.61	1067.83	885.06	49069.28	3540200000
1983	18837.19	12870	3510.35	1159.12	1297.72	53107.38	2906800000
1984	23799.43	16920	4474.71	1263.96	1140.76	59622.53	867400000
1985	26625.21	19729	4841.62	1344.26	710.33	67908.55	1457200000
1986	27887.45	20442	4994.93	1439.76	1010.76	69146.99	1986500000
1987	39204.22	31214	5660.33	1456.22	873.67	105222.8	817100000
1988	57924.38	48679	6009.19	1703.77	1532.42	139085.3	1590100000
1989	69713	56577.43	7970.21	1992.06	3173.3	216797.5	1511300000
1990	84344.61	68416.71	9562.01	2149.05	4216.84	267550	2488000000
1991	97464.06	80002.02	10528.75	2232.01	4701.28	312139.7	1113100000
1992	145225.25	120720.11	15565.6	2740.07	6199.47	532613.8	1514400000
1993	231832.67	196133.79	24723.82	3633.33	7341.73	683869.8	3479300000
1994	349244.86	296966.75	36707.48	5479.85	10090.78	899863.2	7113700000
1995	619806.83	527474.39	65704.63	7560.53	19067.28	1933212	11795000000
1996	841457.07	713786.1	88150.18	9497.9	30022.89	2702719	5634000000
1997	953549.37	807759.75	98033.82	11500.06	36255.74	2801973	19467700000
1998	1057584.01	892052.66	107013.7	14547.64	43969.98	2708431	20267400000
1999	1127693.12	948183	111110.1	17684.27	50715.79	3194015	13836500000
2000	1192910	1000069.45	116393.4	22436.91	54010.26	4582127	19291600000
2001	1594895.53	1337766.57	154495.5	27462.61	75170.9	4725086	57879000000
2002	3357062.94	3050243.47	183202.2	33186.13	90431.17	6912381	32364400000
2003	3624579.49	3275429.22	202263.1	40421.11	106466.1	8487032	8510900000
2004	3903758.69	3478096.41	243887.5	51658.25	130116.5	11411067	48047800000
2005	4773198.38	4228282.24	313252.3	61785.79	169878	14572239	79939400000
2006	5940236.97	5291619.08	378702.6	73461.07	196454.2	18564595	77960300000
2007	6757867.73	6024381	434151.7	83812.04	215523	20657318	136300000000
2008	7981397.32	7114793.958	512943.5	99022.65	254637.2	24296329	110318221860
2009	9193851.68	8207652.731	584940.7	110324.4	290933.9	24712670	138928699319

Source; AIAE data bank, 2011 & CBN
various years

It will be discovered why this situation still persists, even in view of the fact that the policy thrusts of the three tiers of government in the country emphatically aim at self-sufficiency in agricultural production for the nation's teeming population, provision of much needed raw materials for the local manufacturing industries and also to have much agricultural produce for export in order to earn much foreign exchange for development purposes in Nigeria. Related literatures were reviewed under the following heading:

2.2   Agricultural Policies in Nigeria

Agriculture in the context of the economy is tied with the various sectors and is essential for generating broad based growth necessary for development. Agriculture is fundamental to the sustenance of life and is the bed rock of Nigerian economic development, especially in the provision of adequate and nutritious food so vital for human development and industrial raw materials. Sustainable agricultural development is propelled by agricultural policy. The first National policy on agriculture was adopted in 1988 and was expected to remain valid for 15 years; that is up to the year 2003.

Federal Ministry of Agriculture and Natural Resources (1988) stated that Nigeria's policy is the synthesis of the framework and action plans of government designed to achieve overall agricultural growth and development. The policy aims at the attainment of self-sustaining growth in all the sub-sectors of agriculture and the structural transformation necessary for the overall socio-economic development of the country as well as the improvement in the quality of life of Nigerians.

The 1988 Agricultural policy contained the Structural Adjustment Programme (SAP) package as it related to the agricultural sector. Ojo (1998) observed that the overall policy objectives of the 1988 document were to achieve self- sufficiency. The specific objective were the attainment of self- sufficiency in basic food commodities, increase production of agricultural raw materials and processing of export crops with diversification of the country's export base. Other objectives include the modernization of agricultural production, processing, storage and distribution through the infusion of improved technology and management. These involved the provision of social amenities and protection of agricultural land resources from drought, desert encroachment, soil erosion and flood (Evbuomwam, 1988).

The main features of the policy include the evolution of strategies that will ensure self-sufficiency and the improvement of the level of technical and economic efficiency in food production. This is to be achieved through the introduction and adoption of

improved seeds and seed stock; husbandry and appropriate machinery equipment, efficient utilization of resources, encouragement of ecological specialization and recognition of the roles and potentials of small scale farmers as the major producers of food in the country (Idachaba, 1988). A nationwide, unified and all- inclusive extension delivery system under the Agricultural Development Programme (ADP) was put in place in a joint Federal and State government collaborative effort. The agricultural policy is supported by sub- policies that facilitate the growth of the sector.

Ojo (1998) reported that under the SAP, the tariff structure was adjusted to encourage local production and to protect agricultural and local industries from unfair international competition. The marketing boards for scheduled crops were abolished. Bans were placed on the importation of a number of food items including most livestock products, rice, maize, wheat and vegetable oil. Agricultural input subsidies were phased out. A number of new institutions were created for agricultural and rural development namely, the Directorate for Food, Roads and Rural Infrastructure (DFRRI) and the National Directorate of Employment (NDE). Some existing institutions were also reorganized (eg: the River Basin Development Authorities) while most public–owned agricultural enterprises were privatized or commercialized. These SAP measures to some extent had positive impact on the agricultural sector.

According to Nwagbo (2000), although SAP substantially addressed problems of price distortions to farmers, new problems were created by the effects of the changes in macro- economic policies. Implementation bottlenecks arising from, scarcity of basic farm inputs and slower rate of adoption of new technologies also contributed their quota in impeding achievement of policy objectives. These reduced the expected benefits of yield increases accruable from the adoption and use of modern farm inputs such as improved variety of seeds.

A close look at these programme landscape reveals certain fundamental weaknesses, which impede policy and programme effectiveness. Ayoola (2001) stated that the constraints include; in-conducive enabling environment where macro economic policies and the agricultural policy are in disharmony. Secondly, the poor state of rural infrastructure, poor funding and lack of appropriate technology to reduce drudgery, weak agricultural extension delivery services and inadequate database for policy formulation, monitoring and evaluation as well as impact assessment.

The implementation failure of agricultural policy resulted to the reorganization of several institutions in order to realize the sector's objectives (FMA RD, 2001). These include the relocation of the Department of Cooperatives of the Ministry of Labour and

its merger with the Agricultural Cooperatives Division of the Ministry of Agriculture, the transfer of the Department of Rural Development from the Ministry of Water Resources to the Ministry of Agriculture, the scrapping of the erstwhile National Agricultural Land Development Authority (NALDA) and the merging of its functions with the Rural Development Department, scrapping of the Federal Agricultural Coordinating Unit (FACU) and the Agricultural Projects Monitoring and Evaluation Unit (APMEU) and the setting up of Projects Coordinating Unit (PCU).

Others according to Dipo and Omoke (2005) are the streamlining of institutions for agricultural credit delivery with the emergence of the Nigerian Agricultural, Cooperative and Rural Development Bank (NACRDB) from the erstwhile Nigerian Agricultural and Cooperative Bank (NACB), Peoples Bank and the Family Economic Advancement Programme (FEAP). Accordingly, these new institutions are evolving to enable the Nigerian agricultural sector respond to the imperatives of the emerging global economic order especially those contained in the millennium Development Goals. This resulted to the establishment of the National Special Programme on Food Security (NSPFS, 2001).

The 2001 agricultural policy was launched in 2001. The overall goal of Nigeria's 2001 agricultural policy according to FMA & RD (2001) is the attainment of sufficiency in all sectors of agriculture, socio- economic development of the country and the improvement of the quality of life of Nigerians. Dipo and Omoke (2005) asserted that the Obasanjo led administration have, after a close review of strategies and instruments previously adopted in the implementation of agricultural policy objectives, evolved new strategies for laying a solid foundation for sustained increase in agricultural productivity and for enhancing output necessary for growth. Among the new agricultural policy objectives are; Increasing agricultural production through increased budgetary allocation as budgetary allocation to agriculture rose from 10.1 to 16.2 percent from 2005 to 2006 (CBN,2006) and promotion of the necessary developmental, supportive and service oriented activities to enhance production and productivity and marketing opportunities; increasing fiscal incentives to agriculture among other sectors, and reviewing import waiver anomalies with appropriate tariff of agricultural imports among others.

CBN (2005) reported that government's various efforts in credit policy include the establishment of the National Poverty Eradication Programme (NAPEP), Nigerian Investment Promotion Council (NIPC), Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) and Special Presidential Initiatives on Cassava and Rice. These include also the re-capitalization of the Agricultural Credit Guarantee Scheme

Fund (ACGSF) in 1999 and 2000 and the establishment of the Bank of Industry in 2000 and the Small and Medium Enterprises Equity Investment Scheme (SMEEIS) and the Micro Finance Banks.

2.3 Government's budgetary allocation and agriculture in Nigeria

The annual budget remains a veritable instrument in the hands of organizations for planning, control performance, monitoring, evaluation and many other functions. The role that an organization gives to the budget determines the budgeting option for any budget period. Ocheoha (2000), observed that the concept and practice of budgeting is fundamentally the same for all organizations and sectors. Jeffrey (2001), asserted that many governments in West African countries fail to provide essential public goods such as investments in public infrastructures, extension services and research. Most nations in this region according to Jeffrey (2001), have invested less than 5 percent of their annual budgets in any kind of agricultural development, even though up to 75 percent of their citizens still depend on farming. These small budgetary allocations to the sector leave little room for essential agricultural research and development.

Federal office of statistics (1996) stated that the Central Bank of Nigeria's annual reports and statements of account reviewed for three and half decades revealed a declining budgetary allocation to the agricultural sector. The total budget for 1960- 65 was N2091 million and agricultural sector received 4.3 percent. In 1966 ó 1975, agriculture got 2.2 percent out of N25599 million budgeted. The lowest of 1 percent of N43290 million was given to agriculture in 1976 ó 1979. For 1980 ó 1983, agriculture received 2.8 percent out of ₦57942 million total budgets. In 1984 ó 1990, the share for agriculture was 2.3 percent of N257565 million. Again, agriculture received a low 1 percent of N237493 million for 1991 -1995 fiscal years. The states and Local Government Areas expenditure patterns followed the same trend (FOS, 1996; CBN 1965; CBN 1975; CBN 1996; World Bank, 1999).

Federal Ministry of Agriculture & Rural Development (FMA & RD, 2001), pointed out that one major problem of agriculture is that public spending on agriculture and rural development has fluctuated tremendously during the last two decades. Statistics showed that over an 18 year period of 1980 ó 1997, Nigeria spent only 1.45 percent of her annual agriculture GDP or about 0.1 percent of the total budget on agricultural research (Ikpi & Ikpi, 1998). An average of 3.1 percent of the total budget was spent on agriculture between 1999 -2001 (Federal Government budget, 1999; 2001). This was far below the recommended rate of between 12 to 15 percent (World Bank, 2002; FAO, 2003). This is

also in contrast to the Maputo Declaration (July, 2003) on the Comprehensive African Agriculture Development Programme (CAADP) that 10 percent of budget be spent on agriculture by African union member states, (Fan and Sauker, 2006; World Bank, 2006c) as Uganda spends 11 percent annually on agriculture and Ghana 9.5 percent and Kenya 10% (World Bank 2006). Total spending in Agriculture by Vietnam reported by Government/World Bank (2005) is 6 percent low compared to the 15% allocation by China, India and Thailand.

Adefila and Jenyo (2004) observed that inspite of the inadequacy of funds; the limited quantum available to agricultural sector has been diminishing over the years. This is clear when agriculture is compared with some selected important sectors of the economy with regard to capital budget sectorial allocation for the years 1991 ó 2001 and proportion of agricultural budget to the Federal Budgets.

Table 2.2: Capital Budget of selected important Economic Sectors (in N Billions) 1999 – 2001

Economy Sub – Sector:	2001 Proposed share of Budget		2000 Approved Share of budget		1999 Approved Share of Budget	
	N	%	N	%	N	%
Power and steel	69.8	14.4	48.3	15.5	7.1	5.2
Works and Housing	53.0	10.9	35.2	11.3	14.7	10.8
Water Resources	49.8	10.3	13.5	4.3	6.9	5.1
Education	24.8	5.1	23.3	7.5	6.8	5.0
Health	25.1	5.1	5.9	1.9	5.1	3.8
Transport	23.0	4.7	2.2	0.7	1.5	2.2
Agriculture	10.6	2.2	5.8	1.9	6.9	5.1
Defence	20.5	4.1	7.0	2.2	3.2	2.3
FCT	24.5	5.1	20.3	6.5	15.8	11.6

Sources: *1999 – 2001 Federal Government Budget*

Table 2.3:   **Proportion of Agriculture Budget to the Total Federal Budget from   1991 to 2000**

YEAR	FEDERAL CAPITAL BUDGET (N'000)	ALLOCATION TO AGRICULTURE (N'000)	PERCENTAGE OF ALLOCATION TO AGRICULTURE
1991	29,286.2	1,219.0	4.2
1992	39,763.3	941.3	2.4
1993	97,079.4	1,824.4	1.9
1994	120,462.9	2,178.8	1.8
1995	121,138.3	2,144.2	2.0
1996	158,678.3	3,894.8	3.4
1997	207,841.3	6,247.4	2.9
1998	234,085.8	6,064.6	2.6
1999	498,027.9	6,912.6	1.4
2000	239,400.9	8,803.0	3.6
TOTAL	**1,716,527.8**	**40,500.3**	**2.4**

Source: *Central Bank of Nigeria: Annual Report of various years*

Table 2.4:   **Agricultural Output and Percentage Share of GDP and Proportion of Agriculture Budget to the Total Federal Budget from 2002 – 2006**

Year	Agric. Share % of GDP	Agric. Output % Increase	Total Budget (million ₦)	Agric ₦ Budget	% Share Agric Budget
2002	-3.4	4.1	321,398.1	32,364.1	10.1
2003	2.6	7.2	241,688.6	8,510.9	3.5
2004	4.4	6.2	351,260.0	38,669.8	11.0
2005	2.2	6.7	519,510.0	60,310.7	11.6
2006	-1.9	3.6	552,385.8	89,544.9	12.2

Source: *CBN (2006): Annual Report and Statement of Account p.222*
        CBN (2006): Statistical Bulletin Vol. 17 pp. 100-102, 139

However, the 1999 ó 2001 Federal Government Budgets showed a change in allocation to agriculture, which has increased from 1.4 percent in 1999 to 3.6 percent in 2000 (table 2.2).

Despite increase in allocation, agricultural Share percentage of the GDP is very low viz, 3.4, 2.6, 4.4, 2.2 and 1.9 percent from 2002 to 2006. Table 2.3 shows an increase in budgetary allocation from 10.1 to 16.2 percent in 2002 to 2006 and population growth rate of 4.9 percent in 2006 (CBN, 2006). However, the output of major agricultural staple

products in relative percentage increase were 4.1 (2002); 7.2 (2003); 6.2 (2004); 6.7 (2005) and 3.6 (2006) (CBN 2006; IFAD, 2007).

These tables have shown increased budgetary allocations to agricultural sector, but there has not been increase in productivity. The problem has been low agricultural output and productivity. According to Anya (2001) and Ukwu (2004), agriculture has a high employment generating potential. The reducing effect on the rate of unemployment is in line with article one of the millennium development goals. The article (1) include the eradication of extreme poverty and hunger, to halve the number of people with less than $ 1.00 daily and the share of people who suffer from hunger (www.Development goals.Org.2005).

2.4   Agricultural output and productivity (*with emphasis on adps extension services, acgsf, irrigation, rural roads and fertilizer supply*).

Nigerian agricultural sector was rendered less competitive over time through over-valued currency, inappropriate pricing policies and rural urban migration, which caused the dearth of farm labour. Other factors which militate against high agricultural output in Nigeria include: decling arable land area per capital, erratic rainfall and climatic change, poor financing, poor input supply such as fertilizer, agro-chemicals and improved seeds (Nkpado and Ohaka, 2006; Goola, 2008).

According to Ogbonna (2008), robust economic growth cannot be achieved without putting in place well focused programmes to reduce poverty through empowering the people by increasing their access to factors of production, especially credit. The provision of credit has been advocated and used increasingly by governments and donor agencies as an important tool for raising the incomes of the rural farming population. However, access to credit increases not only the size of farm, productivity and income, but facilitates adoption of improved farm practices, marketing efficiency and smoothens farm family consumptions throughout the year (Nwagbo, 1989; Odoko, 2008).

The establishment of the agricultural development programme in Nigeria (1986) ushered in new era in the history of Nigerian agriculture because for the first time, the training and visit system was strengthened. The aim of the ADPS was to raise farm productivity and standard of living of farm families. This was to harness the total capabilities of farmers by extension outreach, to train and encourage farmers to adopt and use improved technologies in agricultural production, processing and utilization, generating activities by facilitating and motivating farmers to form cooperatives groups (Bello, 2005)

The ADP project was implemented in two phase as 1975-1984 was the pilot phase or enclave phase while 1985-1986 was the MS ADP11 which covered all states in Nigeria. The sponsorship of ADP was World Bank 60%, Federal Government 30% and state 10% till when World Bank withdrew its funding. Federal funding therefore increase to 60% and states 40% (Eziakor and Isitor 1998).

Rural feeder roads construction was also wholly done by federal government and latter in 1986 when DFFRRI was established. DFFRRI in collaboration with the ADPs worked to develop rural feeder roads in rural Nigeria communities (DFID, 2005).

Irrigation and dam projects have been funded wholly by the federal government through the establishment of RBDAs which have been reorganized several by policy while federal government have also supplied the bulk of fertilizer to states with a liberalization in the 1990s (Mkpado and Ohaka, 2006).

There have also been about 90% funding of the ACGSF by federal Government through the CBN. These sub-sectors in agriculture derive above 60% of its funding from the federal government since 1970 with little from the states (Njoku, 2000; World Bank, 2008).

The rationale behind the ADPs and the River Basin Development Authorities (RBDAs) new approach to agriculture was to promote the adoption of new technologies by farmers. Apart from these programmes, Sackey (2011), reported that the federal government in an attempt to popularize agriculture and increase domestic food production launched additional programmes, the most popular of which was the Operation Feed the Nation (OFN) in 1976 and the Green Revolution in 1980. To support these, federal government also enacted some legal changes: the Nigerian enterprise promotion decree of 1972 and 1977; and the land use decree of 1978.

Federal government also intervened in the inputs market: it centralized fertilizer procurement and distribution in 1975; and established a supper phosphate fertilizer plant and NAFCON urea plant in1989 with the aim of reducing the country's dependence on foreign source of fertilizer supplies (ii) created a national network of agro-service centres to facilitate the distribution of modern inputs, including the provision of tractor and farm machinery service to farmers, (iii) established eleven River Basin development authorities in 1977 with overriding responsibility for the development of the country's land and water resources, prepare land for agriculture, develop irrigation facilities, and construct dams, boreholes and rural roads (Sackey, Liverpool Salam and Awoyeni, 2011; Takeshima, Adeoti, Okoli, Salan and Rhoe, 2010).

The goals of agricultural extension according to World Bank (2002), included transferring information from the global knowledge base and from local research to farmers, enabling them to clarify their own goals and possibilities, educating them on how to make better decisions, and stimulating desired agricultural development. Investment in extension service have the potential to improve agricultural productivity and increase economies, where more than 90 percent of the world's nearly 1 million extension personnel are located (World Bank, 2002)

Umali and Schwartz (1994) reported that the training and visit (T&V) model of extension organization was promoted by the World Bank during 1975-1995 in more than 70 countries. The system stressed a single line of command with several levels of field and supervisory staff; in-house subject matter specialists to provide training to staff and tackle technical issues reported by field staff; exclusive dedication to technical information dissemination, a strict and predetermined schedule village visits over a two-week cycle, a seasonal workshop with research personnel; and improved remuneration and transport for extension staff.

Increasing agricultural productivity will increase the incomes of both small and large farmers and generate employment opportunities. These increases in income are particularly important because high proportion of people mainly depended on agriculture for their incomes ranging from 45% in East and south East Asia, to 55.2% in South Asia and 63.5% in sub-saharan Africa (FAOSTAT, 2004).

Empirical evidence shows that higher agricultural productivity in Asia consistently raised farmers' income despite declining market prices resulting from increased output. A 1990's survey in India concluded that the average real income of small farmers rose by 90% (Dev. 1998; Lele and Agarwall, 1989). Increased agricultural productivity has also created employment opportunities on farms, though it did not result to higher wages. Cross-country studies estimate that for every 1% increase in agricultural output, farm employment is increased by between 0.3 and 0.6% (Hazell and Kamasamy, 1991; Mellor, 2001a).

Some of the factors that make increasing agricultural productivity difficult are; limited access to finance, inequitable access to productive resources, poorly functioning markets, poorly developed infrastructure and the risk associated with adverse weather, inadequate irrigation facilities, and farm inputs as fertilizers and agrochemicals (World Bank, 2003). For instance, Asia's success in rapidly increasing yields during the green revolution was based largely on irrigated farming systems. In contrast to rain-fed agriculture, irrigation provides a more predictable and responsive physical environment

for new technologies including fertilizers and new crop varieties. Irrigation also gives farmers the opportunity to realize more than one harvest a year (Rosegrant *et al,* 2001).

Poor transport infrastructure limits access for many farmers in the developing world. Road densities are critical to intensifying agriculture. According to Dorward and Kydd (2003), in Africa, road densities are low with respect both to population number and to area, averaging just 63km per 1000 square km about 40times less than in India in 1993. Kelly and Byerlee (2003) have estimated that 60% of Africa's rural population lives in areas with good agricultural potentials but poor access to markets. In a third of Africa countries, transportation cost account for more than 25% of the total value of exports, and in Uganda they exceed 70%, while deficiencies in electricity supplies and telecommunications are widening this infrastructure gap (Vin Braun, Wobst and Grote, 2002).

2.5   The Role of Credit in Agricultural Investment

An empirical study by Govereh *et al* (2007) in Zambia, State that targeting poverty reduction programmes expenditures towards the provision of public goods is crucial for sustainable agricultural growth and poverty reduction. A great deal of research evidence from southern Africa as well as around the world indicates that the greatest contribution that public sector resources can make to sustained agricultural productivity is from sustained investment in crop science, effective extension programme, physical infrastructure, and a stable and supportive policy environment(Goverah etal,2007).

CBN (2007) reported that agriculture has been given special emphasis in view of its high potential for poverty reduction. The Agricultural Credit Support Scheme (ACSS) provides N50.0 billion on financing from different sources to Fund Small and Medium Scale (SME) farmers. The Agricultural Credit Guarantee Scheme Fund (ACGSF) has guaranteed close to N2.50 billion of credit since 2003. N700.0 million has been disbursed to the Ministry of Agriculture for provision of Micro-Credit to farmers.

CBN (2006) stated that a total of 54,032 loans valued at ₦4.3billion was guaranteed in 2006 under the ACGSF. The cumulative volume and value of loans guaranteed from its inception in 1978 to 2006 stood at 497,692 and ₦14.9 billion respectively while that of SMEIS stood at ₦38.2 billion in 2006.

The Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB) has been reorganized and re-capitalized with N50 billion and the National Agriculture Development Fund (NADF) has been established with an initial grant of N10.0 billion. In 2007, the budget provided ₦45.0 million to the Ministry of Agriculture to fund technical

support programmes for private firms providing microfinance to the agricultural sector. The ₦12.0 billion Social Safety Net Programme of the Millennium Development Goals (MDGs) office which includes support for technical assistance certification of micro-credit entrepreneurs, was provided by the small and Medium Enterprises Development Agency of Nigeria (SMEDAN), and micro-credit funding was provided by National Poverty Alleviation Programme (NAPEP)(CBN,2006; CBN, 2007).

According to Magnus (2005), the role of finance in agriculture revolves specifically on micro entrepreneurs, who are low-income persons that own small-scale business; often provide the sole source of income to their families and, typically employ a small number of people in their local communities.

Table 2.5: **NACRCB Loan operations on enterprises basis from 1973-1998.**

S/No	Enterprises/ investment	Approved No	Approved amount ₦ in Millions	Disbursement ₦ in Millions	Repayment principal + interest
A	Large scale	993	571,217,754	426,322,957	488,591,487
1	Crop production				
2	Mixed farming	121	84,783,355	78,740,353	75,627,848
3	Livestock production	1063	233,534,493	158,391,248	200,563,083
4	Fisheries	170	122,991,070	66,133,829	111,013,734
5	On-lending	208	522,086,290	346,810,449	329,194,815
6	Agro-allied services	356	1,352,375,840	1,293,590,960	166,261,409
7	Irrigation	7	379,648,452	251,115,850	282,110,131
8	Marketing	5170	928,646,452	584,357,840	719,945,589
9	Sub-total	8088	4,203,525,368	3,205,443,485	3,543,713,566
B	Small ó scale				
1	Livestock development project	396,793	2,115,895,617	1,876,617,806	166,261,409
C	Special projects				
1	IFAD,ILO,ECOWAS	4,166	300,933,199	211,308,633	199,373,363
	Sub- total	400,959	2,416,828,816	2,087,926,439	1,583,634,791
	Grand total	409,047	6,620,454,184	5,293,369,923	5,127,348,337

Source: *NAC & RDB, various years (1973–1998)*

Table 2.4 shows NACRDB loans operations on enterprises basis from 1973 to 1998. This shows the commitment of huge fund into Nigerian agriculture. The increased credits to the rural sectors were aimed at stimulating productivity in the rural economy.

Arosayin (2003) observed that the demand for rural credit for rural investment depends on the cost of rural credit (interest rate) on the one hand and the returns on the investment/marginal efficiency of capital (MEC) on the other. If the MEC is greater than cost of credit, a rational rural investor will demand for more credit. It is an established fact that credit to any economy when invested in productive ventures will stimulate development.

2.6 Public Investment on Research and Technology and Human Capital Development

According to Omamo (1998) many Africans are poor and live in low rainfall areas where relatively large investment may be needed to increase agricultural productivity. A research on soil fertility management at the Kenya Agricultural Research Institute was to explore the extent to which such investments can be justified on efficiency and equality grounds. Result obtained point to large aggregate potential benefits to Kenyan Society, which is weighted towards Kenya's high ó rainfall areas. However, a significant share of the gains accrue to the country's low ó rainfall areas; where population density is increasing rapidly, and where overall levels of investments in rural infrastructure lag behind those in the high ó rainfall areas. Targeted investments in low potential areas thus may be justified.

World Bank (2004) observed that investment in agricultural science and technology (S & T) has been critically important to past growth performance, and likely to be even more important for achieving future global development priorities; especially the millennium development goals (MDG) of halving/reducing to 50 percent level of poverty and hunger by 2015. The challenges in deciding future investments in agriculture Research Development is to maintain past productivity gain while supporting technological innovations in more diverse agricultural systems. This will differentiate products and add value by processing, to enable rural producers to capture a larger share of the gains.

FAO (2002) stated that investment in agricultural research has major impacts on poverty reduction through direct effect on producer incomes, indirect effects on consumer welfare through lower food prices, employment and wage effects, and growth induced effects throughout the economy. Studies consistently show high returns to investments in

agricultural research in many developing countries, averaging over 40 percent return on investment (ROI).

Many Universities have the potentials to participate in national agricultural research systems. Competitive grants, contracts, and other mechanisms provide the necessary links to do this. In addition, as private Universities are becoming more important in the provision of higher education, they should also have an equal opportunity to compete for government support for technological development programme. The complementary nature of research, education and extension indicates a need for close communication and cooperation among the core institutions in strategic national technology development systems (FAO, 1993).

2.7   Structural Adjustment Programme and Agricultural GDP Growth, Funding and Investment

Nnana, Englama and Odoko (2004), observed that the statistical evidence reveal that output represented by the real GDP in Nigeria showed a positive growth soon after the civil war, following the oil boom of the 1970s such that the growth rate stood at 21.3 percent in 1971. As oil glut of the 1980s hit the World economy, output growth in Nigeria counteracted such that GDP had negative growth rates of 26.8 percent in 1981 to 5.4 in 1984. However, with the structural adjustment programme in the mid 1980s, it grew positively at 9.3 percent in 1986 before a high of 10.9 percent in 1990. This was the highest growth rate ever recorded in Nigeria.

An analysis of Nigeria data using correlation showed a weak relationship between capital formation and economic growth. Soludo (1998) reported that between 1971 and 1980, the average correlation co-efficient between investment and economic growth was 0.11 percent which indicated that though a positive relationship exist between the variables, this relationship is weak. During the period 1981 and 1986, investment and growth moved in opposite directions with a negative co-efficient of 0.22 or 22 percent. Data for SAP and post SAP period indicated that the relationship between investment and economic growth was positive with a correlation co-efficient of 0.30 or 30 percent. The general picture revealed a positive relationship but with a very low average correlation co-efficient (Tunde, 2004).

Nnanna, Englama and Odoko (2004), stated that domestic savings have been inadequate to fund the economyøs growth potentials. Gross Domestic Savings (GNS) has consistently declined, since the introduction of the structural adjustment programme

(SAP) in 1986. The ratio of savings to GDP has also been on the decline; resulting from the decline in real income, high incidence of poverty; low national disposable income; unfavourable economic environment; high unemployment; and inflation. Eboh, Oduh and Ujah (2012) reported that analysis showed that Nigeria agricultural sector is characterized by increasing return to scale, which implies that farmers are operating at low end of the production function. This underscores the huge potential to raise agricultural output through increased use of more efficient inputs, rather than by mere expansion of cultivated land. These factors include rainfall, technology (efficiency parameter) and fertilizer use, and land area is the least important factor. Others are the right institutional conditions (product market, agricultural extension, and agricultural credit) and efficient infrastructure. Growth of agricultural productivity and farm incomes are pre-requisite for structural transformation. Increase in farm incomes pushes up demand for non-farm products, and in turn stimulates the growth of small and medium enterprise (UNECA, 2005; Timmer and Akkus, 2008). However, James (2011) reported that between 1975 and 1986 was the period of massive investment in agriculture and generous credit policy which was associated with the decline and eventual collapse of export crops. With a rapidly rising urban population enjoying reasonable incomes, the demand for food rose to unprecedented levels resulting in price increases (James, 2011).

According to Dio, Nwafor, Alpuerto, Akramov and Salau (2010), the production performance of agricultural sector was on the whole poor in 1981 to 2000 period; except in the 1986 ó 1990 sub-period, due to the relative implementation of structural adjustment policies in that sub-period, due to the relative efficient implementation of structural adjustment policies in that sub-period. Although the structural adjustment programme (SAP) adopted in Nigeria in 1986 led to a reduction in government intervention in the foreign exchange and tradable goods markets such that import protections was lowered and a more liberal trading environment prevailed; cheap food imports reduced the market for domestic agricultural products and left many farmers and workers in the agro-allied industries without sources of income unless they were able to switch to more profitable production (Omonona, 2009).

2.8   Empirical Studies

Shenggen and Neetha (2003) reported that the impact of government spending in Africa on Agriculture and Health was particularly strong in promoting economic growth. Growth in Agricultural production is most crucial for poverty reduction in rural areas. Agricultural spending, irrigation, education and roads contributed strongly to this growth.

Dirga and Sabina (2008) also observed that public spending on education and agriculture is significant and positively related to total factor productivity and hence related to improve the qualities of life and output of agriculture.   Although, there are polar views on the effects of economic growth on development and poverty reduction, it is argued that economic growth benefits the poor on average (Dollar and Kraay, 2002). Although the majority of early development strategies relied on urban bias and industrialization as the main source of economic growth and development during 1960s and 1970s (Schiff and Valdez, 1988; Timmer, 1988), agriculture has been considered to have an active role in the development process since the prominent article by Johnston and Mellor (1961).

A significant number of researchers, Irz and Roe (2005); Kanwar (2000); Kogel (2000); and Furnkranz-Prskawetz; Rangarajan (1982); Ravallion and Datt (2001); Thirtle et al (2001); Timmer (2005); Stern (1996); Wichmann (1997) suggest that agricultural growth promotes poverty reduction; hence the agricultural sector is an õengine of growthö at the early stages of development.

An empirical study on trends in public investment in agriculture by Dhawan & Yadar (1995) showed that though nominal public investment in agriculture have tended to rise year after year in India, the gross capital formation in agriculture as a proportion of the total capital formation in the economy has been declining in both the public and private sector, leading to an overall slump. However, Dhawan and Yadar (1997) agreed that public investment in agriculture is the responsibility of the states, and central government, but many states have neglected investment in infrastructure for agriculture. There are many rural infrastructure projects, which have started but are lying incomplete for want of resources. The central government has an important role to play through macro- economic policies that affect agriculture by provision of adequate resource transfer to states, and in ensuring that state finances and options are not affected adversely by the macro- economic consequences of decisions taken at the centre.

Gulati and Shashanka (1995) stated that the role of government must evolve so that those activities which it still does are performed with the greatest effectiveness, in terms of meeting the needs of the agricultural sector. Public investments in agriculture play leading role in the form of infrastructure as well as necessary research and development in farm technologies. There is an emerging need to step up public investment to implement land reforms and employment prospects of rural labour. The productive base of the farm sector also need to be enlarged through direct public

investments in irrigation schemes, soil and water conservation work, land reclamation and construction of regulated market structures for farm produce (Nwosu, 1995).

Sen (1997) while documenting the marked employment decline in the early nineties have related it to the question of public expenditure and rural poverty. He has drawn the conclusion that the growth in public investment and its multiplier effects on the rural economy was responsible in considerable measure for the decline in the rural poverty. Public investment is a critical formation in agriculture and sustains private investment. There is a recognition that agro- food industry which has a major role in employment generation in agriculture will perform better with new investment being made (Rao, 1998).

Pubic investment in agricultural sector is the pivot to increase the gross area under cultivation, enhancing productivity and bringing about skills in cropping pattern. For Omamo (1998) the complementarity between public and private investments is most pronounced in agriculture. A decline in public investment induced a decline in private investment. In a similar vien, Migra and Chand (1995) on public and private capital formation in agriculture, and inter-alia, stated that private investment in agriculture can increase if public investment grows, implicitly affirming complementarity between the two.

The major problem militating against the accelerated growth and development of agricultural sector in Nigeria is lack of sufficient fund. Sometimes, it is not just lack of finance but untimely release of fund and misuse of available funds (Eziakor and Isitor, 1998). This required both national and global governance. Good governance, at the national and international level is central to growth, poverty and food security (Monsod, 2002). Also, Olarinde & Ajotombi (1999) reported that Nigeria had uninterrupted but declining agricultural trade deficits between 1981 and 1985. in 1981, the country had a deficit of about N21,998,000.00. This declined in 1986 to ₦9,363,000.00 due to deregulation polices of SAP and further rose to ₦1,680,000.00 in 1988. Food import increased in 1989 and in 1993 the deficit became ₦7, 400,000.00.

Ayinde (1997) observed that Nigeria's case was even worsened with an increase in population from 53 million in 1960 to 88 million in 1991 and about 112 million in 1997 without a corresponding increase in the quality or quantity of food produced. Consequently, the import bills rose from N88.3 million in 1991 to N 8.55 billions between 1991 – 1995. This made the contribution from agricultural sector to the GNP to fall considerably from 60 percent in 1966 to 45.0 percent in 1971 and eventually to 20 percent in the eighties, (CBN, 2000). Since 2004, the federal government has been

implementing budget and fiscal reforms under the National Economic Empowerment and Development Strategy (NEEDS). The Government of Nigeria has adopted fiscal strategy and public finance regimes underpinned by the medium- term expenditure framework (MTEF), deficit ceilings, oil price ó based fiscal rule, tax reforms and public procurement (due process) and banking sector reforms. Government has embarked on a number of non- oil tax reforms consistent with revenue smoothing. Based on the principle of diversity, the fiscal system should provide for variety and differences to supply national, regional and local public goods. On the other hand, the principle of equivalence recognizes that the geographical incidence of different public goods and the allocative efficiency criteria would necessitate the equalization of inter-jurisdictional locational advantages, through taxes and public goods provision (Ekpo, 2004; Eboh, et al, 2006).

Agricultural investments tend to rely heavily on banks for debt financing and often have few, if any, sources of equity financing. In light of these characteristics, the availability of competitively priced credit for agriculture remains an important agricultural policy issue (Luciano, 2002). In recent years, many models have been proposed that extend the conventional neo-classical model (Jorgenson, 1963) in incorporating a role for financing constraints in determining investment. When all firms have equal access to capital markets, differences in investment decisions deriving from changes in the user cost of capital will depend on differences in investment demand. In this case internal and external finance may differ substantially from the opportunity cost of internal finance (Hubbard and Kashyap, 1992; Whited, 1992).

Recently, models have been proposed to analyze the connection between the user cost of capital and financial constraints in the agricultural sector. For example, Lagerkvist (1998), estimating the user cost of capital in the agricultural sector, introduced in the optimization problem a constraint on the total amount of external funds attainable by the firm. In this case external funds are a constant fraction of the current value of the total capital stock.

Hubbard and Kashyap (1992), using U.S. agricultural data, estimated a firmøs Eulier equation to model its investment decision where borrowing constraints are explicitly analysed in the context of dynamically optimizing economic agents. Moreover, Benjamin and Phimister (1997), using a balanced panel of French farms, showed that a model that assumes perfect capital market is rejected by the data when compared with a model where adjustment costs in investment and financial constraints affect investment. Again, Ehui and Jabbar (1998) showed that borrowing constraints have substantial impacts on agricultural investment.

In an attempt to provide an empirical basis for explaining the effects of financial constraints on agricultural investment, Luciano (2002) used a method to compute the expected marginal stream of profits per unit of invested capital when imperfections in capital markets, such as a credit rationing or agency costs, can influence borrowing conditions. Luciano (2002) also used the estimated shadow cost of capital to derive a measure for Tobinøs marginal ó Q and showed that this variable is positively and strongly related to the rate of investment in the agricultural sector in Italy during the period 1960 ó 1996 (36 years span).

World Bank (1988) observed that in numerous countries it was once assumed that public investment in Large Scale modern industry would lead to faster growth than the promotion of private investment. In most African countries, the share of the public sector in total investment has been high. However, large-scale state manufacturing industries frequently failed because the domestic markets were not sufficiently developed, management and labour skills were lacking and the net result was to decrease rather than increase economic output.

In some public expenditure, such as roads and irrigation schemes, investment may have a leading role for the development of an area. But in private business, in agriculture, industry and commerce, it is a favourable political, legal, institutional and economic environment to invest profitability (World Bank, 1988).

African leaders see agriculture as an engine for overall economic development. Sustained agricultural growth at a much higher rate than in the past is crucial for reducing hunger and poverty across the continent in line with the millennium development goals to achieve 6 percent growth rate annually for agriculture. A key component of the vision call for improving agricultural productivity through enabling and accelerating innovation within the New Partnership for African Development (NEPAD) and Comprehensive African Agriculture Development Programme (CAADP) to address capacity weakness, insufficient end user and private sector involvement and ineffective farmer support with high investment in Agriculture by the public sector (FAAP, 2006).

DFID (2005) reported that increasing agricultural productivity is most critical in the poorest countries in the earliest stages of development. In these countries, it is justifiable for the government to give a clear priority to agriculture when investing public money and play a proactive role in stimulating and facilitating agricultural development (especially overcoming market failure) so that they get on to the pathway to more diversified and faster economic growth.

Fan; Zhang and Rao (2004) agreed that strategic public investment in agriculture, particularly in roads, irrigation and agricultural research ó is highly effective in increasing agricultural productivity and reducing poverty. However, in many countries, public spending in Agriculture is inadequate and often poorly directed. Where appropriate, governments should give priority to spending that supports agriculture and direct it towards important infrastructure and services that encourage private investment and benefit all citizens. Agricultural research must be effectively funded and research priorities must respond to demand and reflect agricultureøs role in poverty reduction.

Table 2.6: **Classification of Pooled State Governments' Recurrent Expenditure into Sector Subgroups**

Sector Subgroups	As % of total					
	2001	**2002**	**2003**	**2004**	**2005**	**Average (2001-2005)**
Agriculture, livestock and forestry	4.54	3.40	3.53	3.34	3.34	3.63
Industry and commerce	5.12	0.70	0.74	0.67	0.67	1.58
Transport and rural Electrification	3.20	1.92	1.69	3.10	3.10	2.60
Finance	3.58	6.54	4.45	3.45	3.45	4.29
Education	6.80	13.12	15.36	14.17	14.17	12.72
Health	2.66	6.20	6.73	8.26	8.26	6.42
Water Supply	0.00	1.30	1.18	3.32	3.32	1.82
Housing	0.00	0.97	0.93	0.99	0.99	0.78
Town and country planning	0.00	0.66	0.91	0.59	0.59	0.55

Source: *Derived from data contained in Central Bank of Nigeria Annual Report and Statement of Accounts for the Year Ended 31st December 2005.*

Table 2.7: **Classification of pooled state governments' capital expenditure into sector subgroups**

Sector Subgroups	As % of total					
	2001	2002	2003	2004	2005	Average (2001-2005)
Agriculture, livestock and forestry	2.91	2.84	3.57	5.91	5.91	4.23
Industry and commerce	11.67	3.82	1.80	4.08	4.08	5.09
Transport and rural Electrification	18.52	21.98	19.61	23.17	23.17	21.29
Finance	0.45	0.80	3.59	0.82	0.82	1.29
Education	6.71	5.68	5.51	8.69	8.69	7.05
Health	3.13	3.09	4.79	5.13	5.13	4.25
Water Supply	0.00	4.53	4.16	3.95	3.95	3.32
Housing	0.00	3.58	2.67	4.98	4.98	3.24
Town and country planning	0.00	4.40	2.62	3.49	3.49	2.80

Source: *Derived from data contained in Central Bank of Nigeria Annual Report and Statement of Accounts for the Year Ended 31st December 2005.*

The tables 2.5 and 2.6 showed the expenditure pattern of all state governments from 2001 to 2005 which portrayed that it is potentially consistent with the development priorities and policy goals of SEEDS and NEEDS. In table 2.5 pooled states mean recurrent expenditure declined from 4.54% in 2001 to 3.34% in 2005 and the capital expenditure increased from 2.91% in 2001 to 5.91% in 2005 for the agricultural sub-sector respectively.

In an empirical study on linkage between Government spending, growth and poverty in rural India, Shenggen et al (1999), reported that government investment in agricultural research and development (R & D) has the second largest effect on rural poverty, but the largest impact of any investment on growth in total factor productivity (TFP), using simultaneous structural equation system. Government expenditure on irrigation has the fifth largest impact on rural poverty reduction and the third largest impact on TFP growth. Public irrigation affects poverty through its impact on productivity, and this impact is enhanced by its catalytic role in stimulating additional private investment in irrigation; while government investment on roads is found to have the largest impact on poverty reduction, largely as a result of the increases in non- farm employment and rural wages that it induces. The results have implications for agricultural policy by government.

2.8   Theoretical Framework of the Study

The Harrood-Domar model of economic growth forms the theoretical framework of this study. Both Harrod and Domar are interested in discovering the rate of income growth necessary for a smooth and uninterrupted working of the economy. Harrod and Domar assigned a key role to investment in the process of economic growth. They lay emphasis on the dual character of investment.

Firstly, it creates income, and secondly, it augments the productive capacity of the economy by increasing its capital stock. The former may be regarded as the õdemand effectö and the latter the õsupply effect of investmentö. This means that as net investment is taking place, real income and output will increase. However, for a full employment equilibrium level of income from year to year, it is necessary that both real income and output should expand at the same rate at which the productive capacity of the capital stock is expanding.

Otherwise, any divergence between this two will result in excess or idle capacity thus forcing entrepreneurs to reduce their investment expenditures. Ultimately, it will adversely affect the economy by lowering incomes, employment and moving the economy off the equilibrium path of steady growth. So, if full employment is to be maintained in the long-run, net investment should expand continuously. This requires continuous growth in real income at a rate sufficient enough to ensure full capacity use of a growing stock of capital. This is called the warranted rate of growth or the full capacity growth rate.

Mathematically, the model is represented as:

i)   *Domar Model*

Increase in productive capacity

₦1 inv = I.S = 1   í   í   í   í   í   í   í   í   í   í   í   í   í   í   equation (1).

Where   (sigma)   =   net average inv.

Productivity   =   Y/1

∴   Increase in Invest. =   Y = $1^1/$ í   í   í   í   í   í   í   í   í   Equation(2).

However, to maintain full employment equilibrium level of income, aggregate demand is equal to aggregate supply. Thus we arrive at the fundamental equation of the model.

Solving this equation by dividing both sides by 1 and multiplying by   we get

$$\frac{1}{1} \quad = \quad \alpha \;\; \text{í í í í í í í í í í í} \;\; \text{equation (3).}$$

ii)   ***Harrod Actual Growth Rate Model is presented as:***

$$\text{GC} \quad = \quad \text{S} \;\; \text{í í í í í í í í í í í í í í} \;\; \text{equation (1).}$$

Where :

G = rate of growth of output in a given period of time and can be expressed as   Y/Y;

C = net addition to capital and is defined as the ratio of investment in the increase in income i.e. $^{1}/_{Y}$ and

S = average propensity to save i.e. $^{S}/_{Y}$.

 Substituting these ratios in the above equation(1), we get:

$$\frac{Y}{Y} \;\text{x}\; \frac{1}{Y} \quad = \quad \frac{S}{Y} \quad \text{or} \quad \frac{S}{Y} \;\; \text{or} \;\; \text{1=Sí í í .. equation(2)}$$

The equation is simply a re-statement of the truism that ex-post (actual, realized) savings equal ex-post investment.

2.9   Analytical Methods

The analytical framework which has widely been followed to model the effects of public investment on agriculture GDP follows the endogenous growth models of Barro (1990), Romer (1990), Barro and Sala-i-martin (1995,2004) and Greiner, Sammler and Gong (2004). The analytical framework is based on the production function of the constant returns to scale with output being a function of capital, labour and human capital. The literature analyzing the effects of fiscal policy on growth is also recently based on the theory of endogenous economic growth (Barro, 1990; Barro and Sala-i-martin, 1990) where the impact of public expenditure on growth is formalized in a simple endogenous growth model following Barro (1990) and Barro and Sala-i-martin (1990) such where output is a function of technology, labour, the capital stock and government spending.

*T*homes *et al* (2004) similarly found positive effects on labour input and wages. Other panel data assessments by Barro and Sala-i-martin (1995) and Barro (1997) use indicators of agriculture GDP to elucidate economic relationship between public investment and growth.

The relationship between the growth theory and the present model on effects of public sector investment in agriculture share of the GDP as output is a function of

labour and capital stock. The agricultural extension services used as dummy is labour as well as capital since capital is also used in payment of labour for supervision of labour. The second variable, agricultural credit guarantee scheme fund is capital and as well capital is also used in payment of labour for supervision. Thirdly, irrigation cost is capital stock and as well that of rural roads costs and fertilizer costs which are the 4th and 5th variables. The growth theory aptly has shown the relationship between output increases with increase in capital stock, labour and human capital or technical progress.

Most economic variables including agricultural time series tend to be non-stationary. That is to say, that their first two moments, means and variance are not constant. Using OLS with non-stationary variables may result in spurious regressions (Granger and Newbold, 1974). To ensure stationary variables, the equation could be reformulated in terms of differences, but this loses important information conveyed by the levels, such as information on long run elasticities.

In order to avoid this problem, co- integration analysis can be used (Banerjee et al 1993) and when combined with error correction model (ECM), it offers a means of obtaining consistent, yet distinct estimates of both short run and long run elasticity. Hallam and Zanoli (1992), Townsend and Thistle (1995), Abdulai and Rieder (1995) have used co-integration analysis and ECMs to estimate responses involving agricultural data. This approach was adopted by Mkpado in 2010.

When variables are co-integrated (1,1), there is a general and systematic tendency in the series to return to their equilibrium value. Even when short run discrepancies may be constantly occurring, they cannot grow indefinitely. This implies that the dynamics of adjustments are intrinsically embodied in the theory of co-integration, and in a more general way than encapsulated in the partial adjustment hypothesis. The Granger representation theorem states that if a set of variables are co-integrated (1,1), implying that the residual of the co-integration expression is of order 1(0), then there exist an ECM describing that relationship.

Other studies present regressions of GDP per capital growth, or Total Factor Productivity (TFP) on some measures of agriculture outcomes, as well as a Standard set of controls. Few studies include the recent work of Bose, Haque and Osborn (2003) who examined the growth effects of government expenditure for a Panel of thirty developing countries over the decades of the 1970s and 1980s, with a particular focus on sectoral expenditures using the seemingly unrelated regression (SURE) method. Compared to other previous works which did not recognize the role of the budget constraint, the analysis conducted by Bose *et al.*, (study 2003) improves on previous

research on this topic by explicitly recognizing the role of government budget constraint and the possible biases arising from omitted variables. The study finds that the share of government capital expenditure in GDP is positively and significantly correlated with economic growth, but current expenditure is insignificant.

The present analysis modifies the model by Rommer (1990) such that output Yt is assumed to be a function of Kt, the aggregate stock of physical capital. At,s the effectiveness of labour and labour force, Lt. It is assumed that a function ωy, and a fraction of labour, Wy, is used in the production function for the model takes the form;

Yt=(yKt)a(AtWyLt)1-a,0×a×1í í í í í í í í .equation (1)

Where:

Yt = output

Kt = stock of capital

Lt = labour force

a =constant

1= investment

0×a×1 = share of public capital in the production of output and the return to investment.

The model is set in continuous time and hence the time to subscripts is dropped from now onwards. A healthy workforce is assumed to have a positive effect on the effectiveness of labour since it is more productive and less absent from work and therefore contributing positively to growth of output. An educated labour force also positively influences the effectiveness of labour and thus having a positive effect on growth which is determined by the marginal productivity of capital.

2.10 Summary of Literature Review

The review showed various attempts by government to resuscitate agriculture right from the colonial to post independence era. The shortcoming has been x- rayed and prospect evaluated. These highlights are the major issues reviewed.

Njoku (2000) observed that in 1981, the allocation to agriculture was about 13 percent of total government expenditure. However, actual disbursement of funds fell short of the allocation. Nwosu (1995) have shown clearly that government investment is an important determinant of agricultural output in Nigeria. In order words, the level of expenditure on agriculture and its sub- sectors is crucial for promoting agricultural development.

Nwagbo (2000) stated that some investments would cost much to establish and these are above the means of the local communities. These also have much externality; hence the private sector has insufficient incentive to invest in them. In agriculture, the public sectors are most relevant in technology generation and extension, control of plant and animal pests/ disease, funding of research and agricultural education. According to Nwagbo (1998) Federal Government investment in agriculture, have come as establishment of a number of agencies like RBDAs, erstwhile Directorate of Food, Roads and Rural Infrastructure (DFRRI) and so on. Through these projects government has demonstrated a lack of ability to respond flexibly to the needs of the farmers in general and small farmers in particular. Many such government programmes have not stood the test of time. Government Investment and expenditure are high but the output is low and could not meet food demand of the increasing population.

However, Adefila and Jenyo (2004) argued that government subsidized credit facilities are always obtained by those who are enlightened and equally connected and who may, in actual sense not be in dire need of such fund as the peasants in the villages. It boils down to say that such credit facilities are usually misplaced with the result that at the end of the day, the loan may not have any commendable effect on agricultural production or improvement as would have been ordinarily expected. This is usually the case as government loan most often than not is available to highly connected personalities. This justifies the evaluation of national funding and investment in agricultural development in Nigeria.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1   The Study Area

Nigeria is the study area. Nigeria has a total geographical area of 923, 768 square kilometers and a population of about 140 million (NPC, 2006). Nigeria lies wholly within the tropics along the Gulf of Guinea on the western coast of Africa. Nigeria is located between 4^o16 and 13^o53 north latitude and between 2^o40 and 14^o41 east longitude (CIA Fact Book, 2009).

Nigeria has a highly diversified agro-ecological climatic condition and hence, agriculture constitutes one of the most important sectors of the Nigeria economy. The Agricultural sector is particularly important in terms of its employment generation and its contribution to Gross Domestic Product (GDP) and export earnings. Administratively, Nigeria has 36 states with six geopolitical zones and FCT Abuja. These are South-East, South-South, South-West, North-East, North-West and North-Central.

3.2   Sampling Technique

The study covered a period of 39 years from 1970 to 2008. To achieve objective (iii), simple random sampling was used to select 2 state ADPs from each of the six geopolitical zones of Nigeria to get a total of 12 states ADPs out of 36 and FCT. Enugu and Anambra (South East); Cross River and Delta (South south); Ogun, and Oyo (south west); Benue and Plateau (North Central); Adamawa and Borno (North east); Sokoto and Kebbi (North West) were randomly selected and used for the study. The constraints contained in their annual reports, CBN statistical bulletin and annual reports for the period under review were used for the country.

Agricultural Development Programme was implemented in two phases, as 1975-1984 was the pilot phase or enclave phase while 1985-1986 was the multi-state. ADP II which covered all the states in Nigeria. The sponsorship of ADP was World Bank 60%, Federal Government 30% and States 10% till 1996 when World Bank withdrew its funding. Federal funding therefore increased to 60% and states 40% (Eziakor and Isitor, 1998; Okunleye, 2001). The ADPs all over the federal and as implement agency of the federal government in the gates especially with counterpart fundings from the states in specialized projects as Directorate for Food Rural Roads and Infrastructure (DFFRRI), Roots and Tuber Expansion Programme (RTEP), Fadama III,   National Special

Programme on Food Security (NSPFS), Commercial Agricultural Development Programme (CADEP) among others. This position justifies the use of state ADPs to capture the constraints faced by federal government in its implementation of Agricultural projects across the Nigeria States.

3.3 Data Collection

Secondary data was the main source of data. These were collected from journals ó national and international, World Bank, DFID, FAO, IFPRI, IFAD, policy papers and statistical data base and websites. The annual reports of CBN statistical bulletin, statement of Accounts of Federal Bureau of Statistics and ACGSF loan disbursement were also used. Additional data were obtained from ADPs, NACRDB, AIAE data base and NFRA. Data on GDP values was obtained from CBN publications for various years.

3.4   Data Analysis

Objectives (i), (ii) and (iii) were realized using descriptive statistics such as means ratios and percentages. Data on constraints to investment on agriculture in the six geo-political zones were ranked to show the extent each investment constraints is relatively more limiting in each zone, using percentages. Objective (iv) was achieved by OLS to determine the effect of five variables on agricultural output by using the percentage of agricultural share of GDP.

3.5.   The OLS Model (regression equation model)

The model specification relied on the works of Sheggan and Neeha (2003), and Dirga and Sabina (2008) who used linear equation and production function to estimate impact of public spending on total factor productivity in Agriculture.

The Following OLS regression equation was used to evaluate the impact of national investment and spending on Agriculture in Nigeria.

Model Specification :

AgGDP (OUTPUT)	=	f(ADP Ext. service (dummy) + Acgsf $_{-1}$(N)+ Irrg exp$_{-1}$(N) + Fert$_{-1}$ (MT) + RRDS$_{-1}$ -(km) + ei

Where:

AgGDP (OUTPUT)	=	Agricultural output as percentage of GDP is the dependent variable. The independent variables are
ADP Ext.	=	ADPs Agricultural Extension services-dummy
Acgsf$_{-1}$	=	Amount of Agric credit guarantee scheme Fund (Naira) in millions 1970 ó 2008
Irrg. exp$_{-1}$	=	Cost of irrigation (Naira) in period t
RRDS EXP$_{-1}$	=	Rural-feeder-roads-cost(Naira) & distance(km)in period t
Fert mt$_{-1}$	=	Quantity of fertilizer provided in (Naira) and metric tonnes in period t
TREND$_t$	=	Time trend (no. of years)
Ei	=	Error term

HYPOTHESIS:

This testing was achieved by use of t-test. The calculated t-test statistic was produced by the econometric software used in the analysis which is SPSS. The tabulated t-test statistic was derived by the researcher from the statistical tables for comparison.

DECISION RULE: Reject Ho if t- critical or t- tabulated value is greater than the t-calculated. Otherwise accept. For t-tabulated the formula below was used.

$t_{\&}$(0.05) DF

 where DF = N-K
  where DF= Degree of Freedom
         N= Number of years
          K= Number of parameters used
Therefore DF= 39 years- 6 parameters = 33years.
 Checking 33 under 30 @0.05 alpha level gave 1.69 value.
  $t_{\&}$ (0.05),33(1.69).   critical t value=1.69. but for second nul hypothesis which test difference between agriculture and other economic sectors t (0.05).7d.f = 1.895 critical value.

CHAPTER FOUR

RESULTS AND DISCUSSION

Table 4.1 showed that budget allocation to the five economic sectors of agriculture, defence, education, health, and general administration differed in various years. For the period 1970-1974, agriculture received N472.26 million; defence was N2516 .48million; education was N837.18million; health was N106.26 million and general administration was1068.98million out of a total budget allocation of N5001.30million.   Agriculture received lower than defence with N2044.22million; less thanN364.92 million than that of education, less with N596.72 from the budget of general administration, but greater than health with N365.98 million.

Table 4.1: Average national capital expenditure from 1970 -2008 in millions of Naira.

Years	Agriculture	Defence	Education	Health	Administration.	Total Expenditure
1970-74	472.26	2516.48	837.18	106.28	1068.98	5001.30
1975-79	657.24	4472.84	2870.64	194.44	5005.04	13200.20
1980-84	1468.91	1747.11	1474.51	719.51	1553.91	6963.95
1985-89	429.90	719.50	785.90	341.30	609.70	2886.30
1990-94	281.98	638.18	613.58	347.78	1653.58	3535.10
1995-99	309.63	634.43	691.28.	299.13	2022.73	3957.25
2000-04	39036.01	9960.81	12216.91	4586.71	64545.81	130346.25
2005-08	66739587.17	18959688.	32018722.4	64798501.4	131865870.	131865870.

Sources: CBN Annual Reports & Statistical Bulletins; National Bureau of Statistics
Various Years (1970-2009).

From 1975 to 1979 agriculture received ₦657.24 million, defence was ₦4472.84 million, education was ₦ 2870.64million, health was ₦194.44 million, and administration was ₦ 5005.04 million respectively out of a total expenditure of ₦ 13200.20 million. The period between 1980-1984 shows that the case was not different as agriculture was less from defence allocation with N278.20million, N5.60million from education, and N85.00million less of general administration but N749.40 million above that of health (Table 4.1).

The years 1985-1989 showed similar trend as agriculture received ₦429.90 million, defence got 719.50 million, education got ₦ 785.90 million, health wasN341.30 million, and ₦ 609.70 million was given to administration. The years 1990 -1994 was not different because agriculture expenditure was ₦281.98 million compared to ₦638.18 million by defense, ₦ 613.58 million by education, ₦347.78 million by health and ₦ 1653.58 million by administration. The period 1995-1999 (table 4.1) shows that agriculture got ₦309.63 million, defense was ₦ 634.43 million, education was ₦691.28 million, health was ₦ 299.13 million and administration was ₦2022.73 million.

However, the periods 2000-2004 and 2005-2008 differed because there was increased budgetary allocations to agriculture. Table 4.1 shows that in 2000 -2004 period, agriculture expenditure was ₦39,036.10 million, defense was ₦9,960.81 million, education was ₦12,216.91 million , health was ₦4,586.71 million and administration was ₦64,545.81 million.

The years 2005-2008 shows similar trend with 2000-2004 ,as agriculture expenditure was ₦66,739,587.97 million, defense was ₦18,959,687.97 million, education was ₦32,018,722.37 million, health was ₦64,798,501.37 million, and administration was ₦ 131,865,869.67 million respectively. Data result shows the budget allocation and expenditure for the selected economic sectors for the period 1970 -2008, a time series of 39 years.

The implication of the result with regards to agricultural policy of the time is that government increased budgetary allocation to agricultural sector for a period of 9 years(2000-2008) is expected to increase agricultural output to reduce poverty and create sustainable supply of industrial raw materials with an increase in foreign exchange earnings.

4.2. Difference between Budgetary Allocation among Nigerian Economic Sectors and Agriculture from1970 to2008.

The years 1970-1974 show that out of N5001.18 million, agriculture obtained 9.45 percent, defence was 50.36 percent, education was 16.74 percent, health was 2.13 percent, and administration was 21.38 percent. The period 1975-1979(Table 4.2) has shown that agricultureøs share of total expenditure (N13,200.20 million) was 5.0 percent; defence 34%; education 22%; health 1.00%; and administration 38%. However, percentage share of agriculture increased within 1980-1984 to 21% of total expenditure (N6,963.95 million), defence was 26 percent, education had 21 percent, health was 10 percent and administration 22 percent.

In the period 1985-1989 agriculture's share percentage of total expenditure (N2,886.30 million) was 15 ;defence had 25%; education was 27%;while health got 12%; and administration,21%. The period 1990-1994 shows that out of the total expenditure for the selected sectors (N3,535.10 million), agriculture's percentage was 8 percent, defense was 18%, education had 17%; health was 10%; and administration 47% . The years 1995-1999 shows similar trend as agriculture's percentage expenditure was 8 of total; (N3,957.25 million), defence was allocated 16%; education got 17%; while health was 8%; and administration was allocated 51%.

Table 4.2 Percentage average National Capital Expenditure from 1970 -2008 in millions of Naira

Years	Agriculture%	Defence%	Education%	Health%	Adimin%	Total Exp ₦
1970-74	9.45	50.30	16.74	2.13	21.38	5001.18
1975-79	5.00	34.00	22.00	1.00	38.00	13200.00
1980-84	21.00	26.00	21.00	10.00	22.00	6963.95
1985-89	15.00	25.00	27.00	12.00	21.00	2886.30
1990-94	8.00	18.00	17.00	10.00	47.00	3535.10
1995-99	8.00	16.00	17.00	8.00	51.00	3957.30
2000--04	30.00	8.00	9.00	4.00	49.00	130346.30
2005--08	21.00	6.00	10.00	21.00	42.00	314382369.

Source: CBN Statistical Bulletin Various Years(1970-2008).

Between 2000 and 2004, out of total sectorial expenditure of N130346.30 million , agriculture's percentage was30; defense got 8 percent; education was allocated 9 percent; health obtained 4 percent; and administration was 49 percent. In the period 2005 -2008, of the sectorial expenditure of N314,382,368.58 million, agriculture's percentage was 21; defence was 6 percent; education got 10 percent; health was 21 percent and administration 42. percent. This shows the dwindling and unsteady nature of national fund allocation to agriculture and expenditure in agriculture for the period under review (1970-2008).

The findings agreed with those of Cooker (2008) that total national agriculture expenditure witnessed greater stability under civilian regimes more than the military era. The results also showed variations in the budget allocations to the socio-economic sectors and the high trend in the percentage allocation to the agriculture sector which was 9.45 in 1970- 1974 lowered to 5 percent in 1975-1979 period and increased to 21percent in 1980-1984 period. In the year 1985-1989; it declined to 15; 8 and 8 percent respectively in 1990-1994; 1995-1999; and peaked 30 percent in 2000-2004 and declined

to 21 percent between 2005-2008 . This shows that budgetary allocation to agriculture is fluctuating.

4.3:   The Effects of National Funding and Investment on Agricultural Output (GDP) in Nigeria.

Research objective three sought to evaluate the effects of national funding and investment in agriculture on agricultural share of (GDP) using ADP services as dummy variable. Others were ACGSF value, irrigation cost, rural roads constructed in kilometers, fertilizer amount and quantity used in metric tonnes. Data result on objective iii are presented in tables 4.3 to 4.8.

4.3.1.   Average amount of ACGSF disbursed to selected states from 1970 to 2009.

Table 4.3 shows the average amount of agricultural credit guarantee scheme fund to selected states (1970-2009). The amount of credit disbursed to the Northern Zones was more than those disbursed in the Southern Zones.   The North -east had the highest. The value ranged from N4672.86 million to N 423335 million; while those of the North -west ranked second with values that ranged from N2984.96 million to N 259016.8 million. Disbursement in the North -central zone was ranked third with values that ranged from N4901.68 million to N275524.5million.However,South -west ranked 4th with amount between N7,218.1 óN136,100.6; South -east was ranked 5th with loan value between N5,010.66-N78,477.02; and South -south had the least with amount between N2,065.26 and N323,390.2. This showed that access to credit was more in the northern zones which ensured higher agricultural output   than in the southern zones

This infers that the amount of agricultural credit guarantee scheme fund disbursed to farmers varied across the states of the federation. Thus, it implies that there are different interests shown by different states across the country. An increased agricultural credit increases agricultural output which in turn increases income of the small, medium and large holder farmers. This also generates employment because a greater proportion of Nigerians (75%) depends on agriculture. Access to farm finance makes increasing agricultural productivity easier. The fund had a multiplier effects as resource inputs and innovative practices could be easier to use.

Table 4.3: Average Amount of Agricultural Credit Guarantee Scheme Fund
(ACGSF) disbursed to selected states: 1970-2009(N million)

Year	South east	South south	South west	North central	North east	North west
	Enugu/ Anambra	Cross river /Delta	Ogun/Oyo	Benue/ Plateau	Borno/ Adamawa	Sokoto/ Kebbi
1970-75	-	-	-	-	-	-
76-80	5010.66	2065.26	10240.98	4901.68	4672.86	2984.96
81-85	9308.46	1951.62	7218.1	6870.22	8212.42	9329.46
86-90	7446.52	5460.52	11133.14	12001.1	13780.4	15521
91-95	26496.8	19713.6	56080.3	224930	95326.8	52608.24
96-2000	118985.5	207527	246674.4	275524.5	423335.6	259016.8
2001-2005	101817.1	323390.2	185262	199575.2	241196.6	236305.6
2006-2009	78477.02	1701087	136100.6	124708.5	180673.3	197314.7
Total	347542.1	2261195	652709.5	848511.2	967198	773080.3

Sources: CBN- ACGSF 1976-2009; AIAE data bank, 2011.

The result showed that the highest allocation across the zones occurred between 1991 and 2005 for the whole period under consideration. The years 1991 and 1992 were significant because they marked the introduction of group lending innovation. Group Lending deals with the art of using a group to create or foster joint liability with the view that social pressure, group cohesion, group dynamics, group status or reputation serve not only as collateral substitute but also to motivate and enforce loan repayment among members who differ in characters and reactions but have a common interest of benefiting from the group. Group lending differs from conventional micro finance because it aims at providing credit that may include necessary inputs to the poor without collateral.

According to Adams and Ladman (1979), group lending is a promising financial innovation. The worry is that the performance fluctuated. It is indicative of some flaws or abuse of group lending which can be evident as delinquency or default.

4.3.2   The number & percentage of ACGSF granted to selected states (1970 – 2009).

Table 4.4 shows that the number of ACGSF granted to states from 1970 to 2009 and showed that the total number of applicants granted loans in South- east geo-political

zone was 5,012.South-south was 2,466 and South-west was 5000. However, the number was higher in North- central with 7,175 applicants granted loans; North -east was granted a total of 9,975 loans; and 12,634 applicants were granted loans in North- west between 1970 and 2009. The higher number of beneficiaries in the Northern zones also points out that more funds were available for higher agricultural activities and increased output in the zones than the southern zones.

Table 4.4: Number and percentage Agricultural Credit Guarantee Scheme Fund (ACGSF) loan granted to selected states; 1970-2009.

Year	South East	South south	South west	North Central	North East	North West
	Enugu/ Anambra	Cross river /Delta	Ogun/ Oyo	Benue/ Plateau	Borno/ Adamawa	Sokoto/ Kebbi
1970-75	-	-	-	-		
76-80	38	18.33333	75.66667	31	23.66667	42
81-85	196	7.8	99.6	109	57.4	39
86-90	1700	495	1615	1707.8	2841.8	2081
91-95	1399.6	313.4	439.2	1501.8	1460.4	2783
96-2000	648.8	412.8	687	1017.8	945	1924.8
01-2005	647	492	937	2422.2	1182	2410.4
06-2009	520.25	727.25	1122.5	1873.5	3464.75	3353.75
Total	5012(12%)	2466(6%)	5000(12%)	7175(16.5%)	9975(24%)	12634(30%)

(Figures in parenthesis are the percentage values for the geo-political zones)

Source: Field Data, 2011.

The percentage of loans granted to selected states (Table 4.4) showed that north-west got the highest with 30%, followed by north-east with 24% and the third was north-central with16.5%. However, the least was south-south with 6%. Data showed that south-east and south-west got equal percentage of 12% each. These implied that higher percentage of loans granted impinged on agricultural output through increased agricultural activities.

The result is in accordance with that of table 4.3 that high credit accessibility to farmers generally increase agricultural activities and outputs. For the number of persons granted loans, Sokoto and Kebbi with a total number of 12,634 farmers or 30% had more access to agricultural funds of the ACGSF, followed by Borno and Adamawa with 24%,

Benue and Plateau with 16.5%, Enugu and Anambra with 12% as Oyo and Ogun with 12% and the least was Cross River and Delta states with 6%. This explains why the continuous supply of Grain/Cereals and Livestock from the first 6 states to the rest of the country.

4.3.3 The average ACGSF loan amount granted per farmer to selected states; 1970-2009

The average ACGSF loan amount granted per farmer in the selected states are presented in Table 4.5.

Table 4.5:   Average Agricultural Credit Guarantee Scheme Fund [ACGSF] loan to selected states 1970-2009. (N thousand)

Year	South East	South south	South West	North Central	North East	North West
	Enugu/ Anambra	Cross river /Delta	Ogun/ Oyo	Benue/ Plateau	Borno/ Adamawa	Sokoto/ Kebbi
1970-75	-	-	-	-		
76-80	131.8595	112.6506	135.3433	158.1187	197.4448	71.07048
81-85	47.49214	250.2077	72.47088	63.02954	143.0735	239.2169
86-90	4.380306	11.03135	6.893585	7.027228	4.849173	7.458222
91-95	18.93169	62.90236	127.6874	149.7736	65.27445	18.90343
96`-2000	183.3932	502.7301	359.0603	270.7059	447.9742	134.5682
2001-2005	157.368	657.2972	197.7182	82.39419	204.058	98.03584
2006-2009	150.8448	2339.068	121.2478	66.56445	52.14613	58.83405
Total	694.2696	3935.887	1020.421	797.6136	1114.82	628.0871

Source: Field Data, 2011.

The distribution of average loan size per farmer as shown in table 4.5 is some-what balanced between the North and the South. The South-south and North -east ranked first and second with respect to the average loan size per farmer; while the South- west and North-central ranked third and fourth, respectively. It is possible that as a matter of policy, the maximum and minimum values of loan per farmer are fixed. Mkpado and Ohaka (2006) also used an upright ₌uø shaped curve to describe the distribution of the national average loan size per farmer. It could be heart-warming to note that the average

loan size allocated to a farmer has been on the increase since 1992 when the trend analysis depicts an increasing trend from 1991 when group lending was introduced.

The average loan size ranged from N112.65 thousand to N2339.1 thousand from 1976 to 2009 in the South- south and N 131.8 to N150.8 thousand in south-east for the same period. However, the range increased from N135.3 to N197.7 thousand in the South west between 1976 to2005 before declining to N121.2 thousand in 2009.

However, north-central had an increase in average loan amount granted from N158.1 thousand in 1980 to N270.7 thousand in 2000, north óeast increased from N197.4 to N447.9 thousand from1976 to 2000, while north ówest also increased from N71.1 to N447.9 thousand in 2000 before declining to N58.8 in 2009. Generally, the number of beneficiaries increased since the introduction of group lending in 1992. This result is in consonance with Mkpado and Ohaka (2006) that the average amount allocated to farmers per year before the innovation and during the innovation were ₦17,400. 00 and ₦19,820.00. The low value of average loan per farmer reflects under capitalization even with the group lending approach.

The low average amount of ACGSF implies that not enough capital was granted each of the farmers to enable them engage in meaningful agricultural activities that demand high capital. The policy implication is that the mean value of ACGSF should be increased in order to encourage full participation of farmer beneficiaries in large scale and commercial agriculture.

4.3.4 The mean fertilizer supplied by selected states in metric tonnes from 1971 to 2009.

The mean quantity of fertilizer (metric tonnes) supplied by selected states from 1971 to 2009 is shown in table 4.6. The quantity of fertilizer in the country is highest in the northern zones. North -east, with a total of 968801.9 metric tonnes; North -central used a total quantity of 850009 metric tonnes; and North-west used a cumulative of 773957.4 metric tonnes to rank first, second and third ,respectively. South- west was fourth with a total fertilizer consumption of 659786.9 metric tonnes between 1971 and 2009.South-east ranked fifth with a total fertilizer of 1349099 metric tonnes. The least was 2262153 metric tonnes used by South-south to rank sixth.

According to Afua, Ephraim and Victor (2009), fertilizer policy over 1970-1995 was characterized with subsidy and state control. There have been inconsistencies in fertilizer policy in Nigeria over the years. Making retrospective review of the Nigerian fertilizer policy reveals an inconsistency of government fertilizer policy over the years.

Many policies have been formulated right from the pre-1970 period, the pre-structural adjustment period (1970-1985) the Structural Adjustment programme Period (SAP) in 1986 and the post structural adjustment period. Up till 1996 the federal government has free monopoly on the distribution of fertilizer in Nigeria.

However with effect from 1997, trade in fertilizer were liberalized and private importers were free to import and sell fertilizer in the open market. This has reduced the politicization of fertilizer procurement and distribution in and hence it is expected that agricultural output will increase.

Table 4.6: Mean fertilizer (metric tonnes) supplied to selected states ,1970-2009.

Year /Fertilizer	South east	South south	South West	North Central	North east	North West	Price per 50 kg
	Eugu/ Anambra	Cross river /Delta	Ogun/ Oyo	Benue/ Plateau	Borno/ Adamawa	Sokoto/ Kebbi	
66-70	-	-	-	-			
71-75	1556.9	957.5333	7077.367	1498.633	1603.92	877.083	6.6923
76-80	5010.66	2065.26	10240.98	4901.68	4672.86	2984.96	7.26881
81-85	9308.46	1951.62	7218.1	6870.22	8212.42	9329.46	16.21147
86-90	7446.52	5460.52	11133.14	12001.1	13780.38	15520.56	156.8686
91-95	26496.8	19713.6	56080.3	224930	95326.8	52608.24	413.7063
96-2000	118985.5	207527	246674.4	275524.5	423335.6	259016.8	2695.896
2001-2005	101817.1	323390.2	185262	199575.2	241196.6	236305.6	1774.997
2006-2009	78477.02	1701087	136100.6	124708.5	180673.3	197314.7	1593.385
Total	349099	2262153	659786.9	850009.8	968801.9	773957.4	6665.026
Grand total(3,827,808mt)	9%	6%	17%	22.5%	25.5%	20%	

Sources: CBN, 2009;   AIAE data bank ,2011; Field data,2011.

In mean percentage, south-east had nine percent of the total fertilizer consumption of the selected states from1971 to 2009.South-south had six percent in the

same period while south-west had 17 percent consumption.   However, fertilizer consumption was higher in the northern zones than the south. Thus, north-east had the highest consumption rate, with 25.5%, followed by north-central with 22.5% and north-west with 20% ranked third. The least was south-south that consumed six percent of the total for the selected states under the in review.

The United Nations has set the Millennium Development Goals (MDGs) in relation to agriculture including halving poverty by 2015 warranting a growth target of at least 6% per year in agricultural production. The FAO estimates of fertilizer need in Africa (based on yield and area expansions for meeting the MDGs) amount to an increase in total nutrients of 47% or a 2.6% average annual growth rate (Afua, Ephraim, and Victor; 2009).

Since the late 1970s, fertilizer has typically been heavily subsidized, with rates that have been as high as 95 percent. The pattern of total fertilizer consumption in Nigeria has mirrored the up and down of federal and state government subsidies and the almost annual changes in procurement and distribution rules. Currently, the FGN, under the Federal Market Stabilization Program (FMSP), procures fertilizer for sale to states at a subsidy of 25 percent. State governments typically institute additional subsidies on fertilizer. Under the current marketing structure, companies make bids to the FGN to import and distribute subsidized fertilizer (Afua, Ephraim, and Victor;   2009).

The interest different zones and states have in agriculture and fertilizer allocation is reflected on the level of extra subsidy they allocate to fertilizer. Generally, the northern zones have higher fertilizer subsidy than those in the south. For instance, Afua, Ephraim, and Victor (2009) reported that state fertilizer subsidy ranged from 0 to 50 percent. The result showed that percentage subsidy allocations were: Enugu 3%, Anambra 12%, Cross Rivers 6%, Delta 0%, Ogun 10%, Oyo 0%, Benue 50%, Plateau 17%, Borno 19%, Adamawa 18%, Sokoto 50% and Kebbi 12%.

4.3.5 Fertilizer Price

The price of 50 kilogramme bag of fertilizer as shown in table 4.6 rose from less than N10 in the 70s and early 80s to more than N2000 in year 2000 (Nmadu, 2002). Part of the reason for the high cost is the falling value of the Naira against the US dollar as imports are denominated in dollars and more than 50% of the total fertilizer consumption in Nigeria is imported. According to EarthTrend (2006), the cumulative fertilizer consumption in Nigeria from 1961 to 2001 was 6,469,200 metric tonnes while production

was 2,810,700 metric tonnes leaving a balance of 3,658,500 metric tonnes to importation. Earth Trend (2006) also indicated that since 2000, Nigeria's fertilizer price has increased as well as the quantity entering the country with lesser centralized government control. The result agreed with earlier findings by Eboh, Larsen, Oji, Achike, Ujah, Oduh, Amakom and Nze (2006) that fertilizer procurement by the federal government declined from 1.3million metric tonnes in 1990 to less than 200,000 metric tonnes in 2002 and about 245,000 metric tonnes in 2004, despite large expansion of cultivation.

Fertilizer use, therefore, decreased from 13kg of nutrient in 1989-1991to 6kg of nutrients per hectare in 2002. Nigeria can regain competiveness in grains if fertilizer and other yield increasing technologies are widely used. For instance, it was estimated, that in 2000, Nigeria lost about three million tonnes of maize (valued at N31.1 billion) due to fertilizer use short falls.

4.3.6 Share of agriculture GDP, Value of ACGSF(N million), irrigation cost(N million);rural roads constructed(km),and fertilizer used (metric tonnes) from 1970 to 2008.

Data in table 4.7 shows the value of ACGSF, irrigation cost, rural roads constructed, fertilizer consumption; and agriculture's share of the GDP from 1970 to 2008. The result showed that agriculture share of the Gross Domestic Product (GDP) increased from 85924.8 million in 1975-1980 to 270,800.8 million in 2006-2008 period. This was because ACGSF also increased from N0.012638 million in 1975-1980 to N4.371595 million from 2006 to 2008 and increase in fertilizer use from 263.462 metric in 1975-1980 to 86,492.2 metric tonnes in 2006-2008.

Further details in table 4.7 showed that between 1981 to 1985, agriculture share of the GDP increased from 85,924.8 million to 86,793.83 million indicating an increase of 78,201.02 million. In the preceding 5-year of 1986-1990, agriculture's share of GDP rose from 86,793.83 million to 113418.9 giving an increase of 26,625.08 million or a mean value of 5,325.01 million annually. In 199-1995 period the agriculture's share of the GDP continued to rise from 11341.9 to 135990.02 indicating an increase of 22,171.12 million in 5-year span or a mean of 4,434.22 yearly. The period between 1996-2000 followed the same trend of increase in agriculture's share of GDP with 162877.22 million. This indicated an increase of 26,887.18 million over the 5-year span or a mean annual increase of 5,377.43million.   In the period 2001- 2005, increasingly, agriculture's share of Nigerian GDP continued rising up to 204741.06 showing an increase of 41,863.84million over the preceding 5-year period. This showed an annual mean value increase of

8,372.76 million. However, agriculture⊘s share of GDP peaked 270900.8 million between 2006 and 2008, indicating a sharp increase of 66,159.74 million and an annual mean value of 22,053.24 million respectively. The analysis of the agriculture⊘s share of the Nigerian GDP showed a steady increase from 1981-1985 period to 2006-2008. This may not be unconnected with the SAP effect on agricultural -GDP share growth and increased contributions of the non-oil- sector to Nigeria⊘s economic growth and development.

Secondly, the trend analysis of value of Agricultural Credit Guarantee Scheme Fund across the period 1975 to 2008 showed a gradual increase from N 0.012638 million in 1975-1980 to N 0.034522 million in 1981-1985. This was an increase of N 0.022million for the 5-year span. Subsequently, the increase continued in 1986-1990 to N 0.103395 million with an increase of N0.069428 million or an annual increase of N 0.013886 million. In the period 1991 -1995, there was an increase to N 0.103667 million showing a difference of N 0.000272 million or N 0.0000544 million yearly. The period 1996-2000 was also positive in incremental value of N 0.258154 million depicting a difference of N0.154487 million over a 5-year period with a mean annual increment of N0.0308974 million.

 Empirically, the trend analysis for period 2001-2005 was also positive in rising to N1.615016 million. This indicated a sharp increase with N1.352006 million more than the previous 5- year span or N0.270412 million annually. Statistically, between 2006 and 2008, there was further increase to N 4.371595 million from N1.615016 million which differed from the preceding period 2001-2005 with N2.756535 million or N0.0551307 million on yearly basis. In summary the result showed also a steady increase in value of ACGSF amount disbursed to farmers across Nigerian states.

Thirdly, the fertilizer profile showed a similar trend with ACGSF as table 4.7 showed that between 1975 and 1980 263.46 metric tonnes of fertilizer was used by Nigerian farmers but the value increased to 825.74 metric tonnes in 1981-1985, indicating a difference of 562.30 metric tonnes or 112.46 annually. Subsequently, the period 1986-1990 increased from 825.76 metric tonnes to 890.96 metric tonnes showing a difference of 65.19 metric tonnes over a 5-year span or 13.04 metric tonnes yearly. The increase continued in 1991-1995 period to 41574.236 metric tonnes which indicated a difference or an increase of 40,683.28 metric tonnes or 8,136.66 metric tonnes annually.

Furthermore, the increase continued in period between 1996-2000 span with 64,776.858 metric tonnes which was an increase of 23,202.62 metric tonnes of fertilizer or4,640.52 metric tonnes annually. The data result also showed that between 2001-2005, a total of 74,278.758 metric tonnes of fertilizer was used indicating an increase of

9,501.90 metric tonnes or 1.900.38 metric tonnes yearly. Finally, between 2006-2008 showed an increase from 74278.758 metric tonnes to 86492.21 metric tonnes of fertilizer used which indicated a difference of 12,213.45 metric tonnes or a mean annual increase of 2,442.69 metric tonnes of fertilizer. Statistically, there was positive increase in metric tonnes of fertilizer used in Nigeria from 1975 to 2008.

However, irrigation cost decreased from N122,893 million in 1975-1980 to N41,942.2 million in 2006-2008 as well as the low increase of rural roads constructed in kilometers from 7,384.3 in 1975-1980 to 34,341.3 in 2006-2008. Though, the road network is not significant both in density and coverage as to contribute significantly to the agriculture share of the GDP in Nigeria in the period 1970-2008 under review. Available fund in most African countries allow for demand of loan not exceeding N250 000 (or $166.7) per individual singly or in a cooperative without collateral (AFRACA, 2000). Such fund can hardly empower for meaningful investment in agriculture.

Public spending on agriculture as a share of agricultural GDP in sub-Saharan Africa is less than half of that in other regions, and less than half the NEPAD target of 10 per cent of the national budget. Reducing taxation and barriers to agricultural growth and improving rural investment climates is the first priority, but in many African countries carefully targeted and designed subsidies must be part of a comprehensive strategy to improve agricultural productivity (CSAC, 2008).

Table 4.7: Share of Agric. GDP; value of ACGSF(Nm); irrigation cost(N); rural roadsø(km.), fertilizer used(mt) between 1975 and 2008.

YEAR	ag gdp (million)	Acgsf (million)	Irrigation cost (N)	Rural roads km	Fertlizer(mt)
75-80	85924.8	0.012638	122893	7384.333333	263.4616667
81-85	86793.82	0.034522	466377.4	23586.08	825.764
86-90	113418.9	0.103395	447281	11829.64	890.956
91-95	135990.02	0.103667	57900.9	31231.09	41574.236
96-2000	162877.22	0.258154	16538.38	32179.86	64776.858
2001-2005	204741.06	1.615016	40506.02	33260.46	74278.758
2006-2008	270900.8	4.371595	41942	34341.25	86492.21

Source: CBN various years (2011).

According to IFPRI (2004:2), the main result of these past policy and institutional failures are the considerable undercapitalization of African agriculture. Barely 7% of arable and permanent cropland is irrigated, compared to about 40% in Asia. In addition to

negligible use of selected/improved seeds, fertilizer use per hectare of arable land in Africa stands at only 8% and 15% of the levels reached, respectively, in Latin America and Asia. The number of tractors per thousand hectares of arable land is nearly three times greater in Asia and eight times greater in Latin America. Likewise, road density is more than 2.5 times higher in Latin America and six times higher in Asia than in Africa. On the human capital side, African institutions of agricultural higher education, research, and extension are, in general, poorly staffed, ill equipped, and under-funded to provide the scientific and technological foundations of a structural and sustainable transformation of the food and agriculture systems. Because of this under-capitalization, average productivity of agricultural land in Africa was estimated at only 42% of that in Asia and 50% of that in Latin America during the last decade. Similarly, the productivity of labour in agriculture in Africa stood at less than 60% of that in Asia and Latin America.

4.3.7 The impact of national investment and funding in agriculture on agricultural GDP from 1970 to 2008.

The result of evaluation of the impact of national investment and funding on agriculture share of GDP from 1970 to 2008 is presented in table 4.8.

Table 4.8: Evaluation of the Effects of National Funding and Investment in agriculture on Agricultural share of GDP (1970-2008).

Variables	Coefficient	Std. Error.	t-value	t-prob.
Constant	-34.3162	16.5350	-2.0753	0.0476
ADP	7493.6	3606.4	2.0781*	0.0481
DFERT_ME_1	2.3916	0.9270	2.5797*	0.0156
DIRREGAT_1	0.1986	3.6654	0.6749	0.0010
DRURAL_R_1	0.1372	5.0416	1.5916	0.3328
DDacgsf_1	2.02211	0.0041	2.6321*	0.0131
ECM_1	-5.8708e-003	3.6337e-003	-1.616	0.1079

R^2 = 0.8621, F(6, 25) =30.0979[0.0031] DW =2.02.Critical t-value =1.69.*significant.
Source: Field data (2011).

The dynamic analysis of effects of national sector investment on agricultural GDP shown in table 4.8 is acceptable. It is because of its significant F-ratio (30.979), very low f-statistics probability (0.0031); acceptable Dobbin Watson Statistic (2.02); relatively high coefficient of determination (0.86) and significant explanatory variables whose coefficients are in consonance with basic economic concepts and theory. The coefficient

of determination ($R^{2)}$ of 0.86 implies that 86 percent of the variations on agricultural share of GDP was predictable by the   multiple regression model. Three explanatory variables were significant at 5 percent level of significance ($t_{\&}(0.05)$, DF=33)$_=$ 1.697. This showed that the three explanatory variables out of the five chosen have effects on the agricultural percentage share of GDP.

i)   Agricultural   Development   Programme   extension   services: ADP services were directly related to agricultural percentage share of GDP. Its coefficient was 7493.6 while its t-value was 2.0781 which was significant at 5 percent probability level. It implies that since the inception of ADP services in 1986, agricultural percentage share of GDP has been on the increase and as such, the continuous use of the ADP services will lead to greater agricultural percentage share of GDP. In a similar vein, Madukwe (1999) argued that improved agricultural extension system helped to increase framersø output and income.

The public sector seed distributors are the state Agricultural Development Programmes (ADPs). The ADPs are state based programmes established primarily for carrying out extension services to farmers in their respective states (Eboh, Okoye and Ayichi,1995). Every State in the federation has an ADP. In addition to providing extension services, state ADPs produce and distribute certified and authorized seeds using appointed out -growers in their state and also carry out seed promotional programmes (Ikpi, 2001). The Directorate of Food, Roads and Rural Infrastructure (DFRRI) was created in 1986 to provide rural roads, wells and bore holes. Under the ADP system, roads and other facilitties were provided to enhance input distribution and evacuation of farm produce (Ikpi 2001).

Stephen and Lawrence(2007) found that, in Uganda, analysis by IFPRI suggests that spending on agricultural research and extension had improved agricultural productivity substantially(for each marginal shilling invested 12 shillings were returned) and had the highest impact on poverty reduction followed by feeder roads(7 shillings);and 3 shillings for education (IFPRI,2004).

ii) Fertilizer use in tonnes:

The quantity of fertilizer used in the country was positively related to agricultural GDP. Its coefficient was 2.3916 and its t-value was 2.5797 which was significant at 5 percent probability level. It means that the more the quantity of fertilizer used, the higher the value of agricultural GDP.

A fertile and productive soil is the fundamental resource for farmers and sustainable farming. The farmer's objective is to attain profitable yields and also maintain

the productivity of the soil. This implies the need for good stewardship on his part, that is, maintaining a good physical structure, organic content, good aeration, an adequate moisture content, proper pH, and an optimal nutrient status. The management of such a system is a complex task. As a result of intensive farming, we are already having problems of severe organic matter depletion, deficiencies of secondary and micro nutrients like S, Zn, B and Mo in the arable lands.

Current research data (BARC, 1994) from the NAR Institute demonstrate that more than 60 percent of the arable land have organic matter content much below the critical level and the rate of depletion of organic matter is still alarming. Besides, S and Zn deficiency areas have been identified in over four and nearly 2 million hectare of arable lands respectively.

iii). Value of Agricultural Credit Guarantee Scheme Fund (ACGSF)

Agricultural credit had positive relationship with agricultural GDP (Table 4.10). Its coefficient was 2.0211 while its t-value was 1.5916 which was significant at 5 percent probability level. It implies that the more the value of ACGSF used, the higher the value of agricultural GDP. The result is in line with those of Onah (1994), Oliveria, Larsen, Bittencourt and Graham (2003) as well as Okpukpara (2005),who were of the view that proper use of credit increased farmersø output.

World Bank (2008) study on agricultural growth in Nigeria cites the improvement of financial system as a key growth pillar for the sector. Financial access increases income through productive investment, helps create employment opportunities, facilitates investment in health and education and reduces the vulnerability of the poor by helping them to smoothen their income patterns over time. Financial exclusion of the rural Nigerian population stunts development. Fewer than two percent of the rural households in Nigeria are estimated to have access to any sort of institutional finance (World Bank, 2008).

The result was also observed in an earlier study by Dirga and Sabina (2008) that agricultural expenditures usually have immediate and short run impacts on rural poverty. Also, Fan (2004) found a positive relationship between public spending in agriculture and productivity growth in India. Fan and Saukar (2006) also reported that in Africa; agriculture expenditure as percentage of agricultural GDP remained relatively at 5.4-7.4 from 1980-2002. In Asia, expenditure as percentage of agricultural GDP was much higher at 8.5 ó 10.5 percent than in Africa while in latin America it decreased from 19.5 percent in 1980 to 11.5 percent in 2002.

iv). Irrigation cost and investment from 1970 to 2008.

The amount spent on irrigation as shown in table 4.10 has not significantly affected national agricultural GDP.

This result did not agree with Eboh *et al*. (2006) that the gains achieved under Fadama I and the projected benefit of Fadama II clearly demonstrated the critical role of irrigation farming and water management in upward shift of productivity and incomes. Fadama I yielded economic rate of return of 40% compared to an estimated 24% at appraisal (World Bank, 2003).   Eboh et al (2006) also reported that total irrigated area is positive and significant on yield. In line with exact expectation that irrigation development is critical to improved yields (Renewable National resources; sustainable Economic Growth and poverty reduction in Nigeria).

The findings agreed with earlier study by Nnadozie and Iyi (2009) that lack of financing, improved seedlings and fertilizers were among the major constraints to improved irrigation farming by small holder farmers in Enugu State. FAO (1986) as well observed that problems facing irrigation in Nigeria included lack of sufficient maintenance and lack of sufficient credit. The result has shown Nigeriaøs inability to meet the comprehensive Africa Agricultural Development Programme (CAADP, 2008) objectives on increasing the amount of land irrigated and sustainable management of soil and water.

CAADP (2008) foresees investments of more than US250 billion between 2002 and 2015. Major problems are that of storing water in Africa. Just $50m^3$ of water is stored per person, compared to 3,500 m^3 per European. In response, more than 130 dams are now planned. These will fulfill the dual role of supplying demands for energy-desperately lacking in many African countries and agriculture. Kenya, Nigeria, Sudan, Tanzania and Zambia have the greatest potentials for irrigated land of between 100,000 and 250,000 hectares annually. There is need to reappraise the irrigation development strategies of the federal and state governments to ensure local ownership, efficiency, viability and sustainability.

**v).   Amount spent and distance of rural roads constructed in km from 1970
        to 2008.**

Amount spent on rural roads and length constructed (km) which were presented in table 4.10 had not significantly affected agricultural GDP. Earlier, in a study on the involvement of small holder farm sector in agriculture in Uzo Uwani Local Government Area of Enugu State, Nigeria, Nnadozie and Ugwu (2008) reported that about 22.1 percent of the respondents agreed that irrigation facilities constrained them and 21.3

percent agreed that lack of access roads to their farms was problematic. The policy implication is that federal government investment and funding on irrigation and rural feeder roads must be stepped up to have a positive impact on agricultural output and its share of the GDP. FARA (2006) found that investment in infrastructure, particularly rural feeder roads, can also lead to large productivity growth and poverty reduction effects. Poor rural infrastructure raises farm to market transaction costs and lowers farm income by increasing costs of using markets to acquire and dispose of goods and services (Omamo, 1998).

This implies that much needed to be done in rural feeder roads density and coverage. The shortage of access feeder road across the country has resulted to poor distribution and spoilage of agricultural products. This increase prices of food products and as well increase post-harvest losses.

4.4 Different Economic regimes' (pre and post sap) Effects on Agriculture Share of GDP in Nigeria.

The various economic regimes ie pre and post- SAP were evaluated to identify their effects on agriculture percentage share of GDP from 1960 to 2009. The result showed agriculture, industry and service sectors as indicators in table 4.9.

Table 4.9: Economic Regimes (pre and post SAP) effects on agriculture percentage share of GDP in Nigeria (1960-2009).

Economic regimes	pre-s	pre- s	pre- s	SAP	post- s	post- s
Indicators and years	1960	1970	1980	1990	2000	2009
Agriculture	64.3	44.7	20.6	31.5	35.8	42.1
Industry	5.8	19.4	34.6	43.2	37.0	22.0
Services	29.9	35.9	44.8	25.3	27.2	35.9
Total percentage	100	100	100	100	100	100

Sources: NBS (2009), CBN (2010), AFDB (2010) and World Bank (2010).

Agriculture contributed 64.3 percent of GDP in 1960 but this percentage share declined to 44.7 in 1970. This may however be attributed to the three year old civil war that ravaged Nigeria and distorted her economy.   In 1980, agriculture share of GDP was 20.6 percent which was why federal government adopted the structural adjustment programme in 1986. However, between 1986 and 1990 (SAP-era) there was an increase from 20.6 to 31.5 percent for agriculture share of the GDP. Thus, an increase of 10.90 percent. Result also showed positive increase in year 2000, as the percentage agriculture share of the GDP increased appreciably from 31.5 to 35.8 and the positive increase peaked 42.1 percent in 2009. This statistically represented 6.30 percent agriculture share

of the GDP in Nigeria. The data results implied that there was a positive effect of SAP on the percentage agriculture share of the GDP in Nigeria.

The structural adjustment programme comprised a mix of demand óside policies, supply- side policies and other policies designed to improve Nigeriaøs agriculture and international competitiveness. Generally, major sectorial policies for agricultural development which were in operation in the SAP era included those on agricultural research, agricultural extension and technology transfer, input pricing and subsidy, water resources and irrigation and agricultural land development.

4.5. Major Constraints to National Investment and Funding Of Agriculture in Nigeria.

National funding and investment according to CBN(2005) include all federal expenditure and investment in the agricultural sector of Nigerian economy especially in the followings; infrastructures as rural roads, irrigation, processing, ADP extension services, research and human capital development; farm credits as in ACGSF, supply and provision of agro-inputs like fertilizer that are on yearly basis. This also include counter-part funding of projects being sponsored by federal government to increase agricultural output. These expenditure on a long run form national investment and funding in agriculture. Investments are on long term projects while funding are on short term and recurrent expenditure.

Eleven major constraints were identified in this study as affecting national sector investment in Nigeriaøs agriculture. Of all the constraints, financial and infrastructure constraints seemed to be most critical to investment in Nigeriaøs agriculture (Table 4.10). These were followed by economic, political, technical and socio-cultural constrain. Institutional, health and land tenure constraints are identified in that descending order of importance as the least limiting factors to national sector investment in agriculture in Nigeria. However the intensity of the constraints differed across the six geo-political zones or development domains as indicated by the result.

North-west ranked first with 79.70 percent constraints. The second most constrained zone was south-east with 76.50 percent; while North-central ranked third with 69.50 percent. North-east was in the fourth position with 65.00 percent, south-south fifth with 62.10 percent and south-west was sixth with 51.10 percent . This implied that the south-west was the least constrained in the implementation of national investment in Nigeriaøs agricultural sector.

Table 4.10: Various Implementation Constraints to National Funding and Investment In Nigerian Agricultural Sector (1970-2008).

S/NO	Nature of Constraints	NC	NE	NW	SE	SS	SW		Nigeria
1	Technical- Power failure, poor technology, poor quality of raw materials, inadequate fertilizer supply.	9	7.5	9	9	7.5	4.5	29.5	54.6%
2	Infrastructure ó Irregular water supply, erratic power	7.5	4.5	6	4.5	9	7.5	39	72.2%
3	Economic- Low Role, inadequate funding	6	9	9.1	6	1.5	6	37.6	69.6%
4	Financial ó Insufficient credit it to farmers, high risk of lending, few financial institutions.	9	6	9.1	9	9.1	9.1	51.3	94.9%
5	Political ó Political crisis, lack of trust, poor leadership.	7.5	4.5	9	6	6	3	36	66.6%
6	Health ó Malaria, inadequate health facilities.	1.5	4.5	6	6	4.5	1.5	24	44.4
7	Macro- Economic policy massive input of food, in consistent export policies, week import policies.	3	3	6	6	3	1.5	22.5	41.6%
8	Institutional ó Inefficient banking system, bureaucracy, inadequacy of polices.	3	3	4.5	7.5	3	3	24	44.4%
9	Land tenure ó Land fragmentation	6	4.5	1.5	4.5	3	4.5	24	44.4%
10	Labour óHigh cost of labour	4.5	3	6	6	1.5	4.5	25.5	47.2%
11	Socio-cultural;religious strife;ethnic crisis;resource control;high crime rates;landdispute.	4	6	7.5	1.5	7.5	1.5	28	51.8
12	Environmental -. Policy regulations; chemical pollution; deforestation; oil spillage; erosion; soil infertility	4	5	6	6	3	1.5	27	50
13	Micro-Economics-Poor Agric Credit; Low Input; Weak Technology; Storage; And Processing Policies	4.5	4.5	3	4.5	3.5	3	23	42.6
	Geopolitical zone percentage total	69.5	65.0	79.7	76.5	62.1	51.1		

NB: 13 variables ranked 9-9.1 percent for the six geopolitical zones of Nigeria with a constant of 1.85 for percentage values for Nigeria.

1. NC = North Central   4. SE = South East

2. NE = North East   5. SS = South South

3. NW = North West   6. SW = South West

.

i)   **Financial constraint:**

Financial constraint (94.9%) was the most important constraint to national investment in Nigeriaøs agriculture. It has been a perennial problem confronting investors in both the up-stream and downstream segments of agriculture. Overall, the constraint

manifested in terms of poor access to credit, and high lending rates. The two combined, along with bureaucratic bottleneck, led to an inefficient financial market. Zeeler, Schicieder, Braun and Heidhues (1997) reported that poor finance was one of the problems of agriculture and food security

ii)   **Infrastructure constraint:**

The second most critical constraint to national sector investment in Nigeria¢s agriculture was the infrastructural constraint (72.2%). Infrastructural constraint manifested most in the physical context across the zones in the form of bad roads/ poor state of roads, poor marketing facilities and outlets, and epileptic power supply. Specifically, the key nature of infrastructural constraint in both north- central and north-west zones was the poor state of telecommunication services. On the other hand, lack of processing facilities was common to both the north-east and the south-south. Both south-east and south-west identified poor state of health facilities as an important infrastructural constraint in their domains. Udoh (1995) observed that infrastructure is one of the constraints to income and poverty alleviation. As a constraint to income, poor infrastructure limits investment and agriculture is not an exception.

iii)   **Economic constraint:**

Though very important, economic constraint(69.6%) was the third in the hierarchy of constraints to national sector investment in Nigeria¢s agriculture. This constraint is critical to public sector investment in agriculture in the north-east and south-east zones of the country. Also, the constraint was fairly pronounced in the north-west, north -central, and south-south. Across the zones, economic constraint manifests in the form of high cost of production and low returns to investment. Similarly, high cost of marketing was a common economic constraint in the north-east, north-west , south-east and south-west zones. Both the south-east and the south-west identified low income and poverty as additional economic constraint in their zones. Furthermore, the south-south viewed corruption as an element of economic constraint.

iv)   **Political constraint:**

This was one of the factors that militate against national investment in agriculture. It ranked as the fourth (66.6%) most critical constraint or problem affecting investment in agriculture in Nigeria. In descending order of importance, north-west, north -central, north-east, south-west and south-south, prioritized the constraint as having a critical effect on investment in agriculture. Two macro issues bordering on governance were identified as the main nature of political constraint thereby leading to the diversion of agricultural

facilities to unintended beneficiaries. Civil disturbance was an additional element identified by the north-west, while selfish interest was also identified by south-west.

v) **Technical Constraint:**

This is the fifth (54.6%) most important constraint to national sector investment in agriculture in Nigeria. The north-west, south-east and north- central, had same order of the intensity of the constraint to investment in agriculture followed by north-east and south-south. The least was south-west . In general, poor technology, poor access to markets and lack of improved inputs were constraints in the country. In addition to these, the north-central, north-east, and south-west zones identified poor managerial skill as another technical constraint in their respective domains. Also, north-central identified poor harvesting and processing technology as the specific technical constraints.

vi) **Socio-cultural constraint:**

Socio-cultural constraint with 51.8% was the sixth most important constraint to national sector investment in Nigeria. This may be due to the fact that the zones had come to terms with living with the problem and had adjusted to the situation. Overall, corruption, insecurity, and ethnic strife/crisis cut across the different zones. The north-east and north-west zones identified religious strife disguising as ethnic crisis as an additional element of the constraint. This is understandable from the point of view of the south-south where fights over land and water resources are predominant. The availability of mineral resources, especially crude oil, further compounds this situation. A secondary element of socio-cultural constraint is high crime rate, which is a function of insecurity within the system, and which cuts across the six zones. Ohaka, Arene and Mkpado (2005) were of the view that socio-cultural factors influenced farmersø participation in economic activities. Such activities included investment, savings and access to other banking services which can help one to improve production and his/her welfare.

vii) **Environmental constraint:**

Environmental constraint (50%) was ranked seventh among the identified constraints to national sector investment in agriculture in Nigeria. The nature of the constraint can be classified broadly into two, namely: environmental regulations and physical environmental constraint. Each of the zones identified specific nature of the constraint in their area. For instance, in the north-central, chemical pollution and deforestation were the main elements, while erosion, drought, pest and disease attack were identified in the north-east. The south-south identified oil spillage and erosion,

south-east identified erosion and soil infertility while south-west identified environmental pollution. Of the four zones, the environmental constraint was the highest in the south-south zone. IPCC (2007) have assessed possible impact of climate change on African agriculture. The report was   of the view that climate and environmental factors constituted problems to farmers especially where there was little adaptation capacity. Nzeh and Eboh (2011) reached a similar conclusion in Nigeria and Enugu State in particular.

viii)   **Labour constraint:**

This was ranked eightieth with 47.2% among the constraints to national investment in Nigeria's agriculture. The constraint was least pronounced in the north-central. Overall, labour constraints was more limiting to national investment in agriculture in the southern parts compared with the northern parts of the country. The key elements of labour constraint across the zones were lack of skilled manpower and high wage rate. Specifically, the south-south, south-east and south-west identified inadequate supply of all categories of agricultural labour as an element of labour constraint. Chidebelu (1991) also noted that small-holder farms in Southern Nigeria were faced with labour constraints.

ix)   **Health constraint:**

Health was ninth with 44.4% as constraining factor to national sector investment in Nigeria's agricultural sector.. However, judging by the responses across the zones, the north-east and the south-east zones were more affected by this constraint than the other zones of the country. The main elements of the constraint were inadequate health care facilities and the threat of HIV/AIDS and malaria, which cut across the zones. Interestingly, fake or expired drugs were identified as an additional element of health constraint in the south-east zone. This was expected as the bulk of the fake or expired drugs came from the south-east where the National Agency for Food and Drug Administration and Control (NAFDAC) is currently engaged in a running battle with fake drug dealers.   In the view of Ene-Obong (2007), a balance is required among food, nutrition and health to fight food crisis.

x)   **Institutional constraint:**

Institutional constraint was one of the factors affecting national investment in Nigeria's agriculture. It was ranked ninth (44.4%) among the critical factors affecting investment in agriculture. The constraint was less severe to agricultural investment in northern Nigeria. However the constraint was most severe in south-east zone of the

country followed by south-west. The key elements of institutional constraints were ineffective banking services, inefficiency of the public institutions and poor attitude to work by government officials leading to bureaucratic bottleneck. The south-south zone identified discrimination against agriculture by financial institutions in its domain, while the south-east specifically identified inefficient labour and poor saving systems as part of the elements of institutional constraint in the domain.

xi)   Land tenure constraint:

Ranked low with 44.4% in the ninth position among the constraints to national investment in agriculture. In general, the southern parts of the country experienced more severe land tenure constraint than the northern parts of the country. This is understandable, given the high population density and the attendant land fragmentation in the southern parts of the country. The various zones identified land fragmentation as a general phenomenon. Specifically, north-west, south-south and south-west zones identified cumbersome land acquisition process as an element of land tenure constraint. Similarly, the north-east, south-east and south-west zones identified insecurity of title to land as an element of the constraint. Additionally, the south-east identified high rate of land rent, while north-central and south-south identified fraudulent practices. This constraint ranked joint ninth was also an element of the socio-cultural constraint. Arene and Mkpado (2004) noted that within the socioeconomic factors affecting agriculture, land tenure problems were very critical to agricultural investment especially long-run sustainable management.

 xii)   Microeconomic policy constraint:

Microeconomic constraint was another factor impeding national sector investment in agriculture. Ranked twelfth (42.6%) among the constraints, it was characterized by poor agricultural credit and input policies, poor technological policy , poor storage and processing policies which cut across the six geo-political zones.

xiii)   Macro-economic policy constraint:

The macroeconomic policy climate dictates the environment in which sectorial activities are carried out. This constraint ranked thirteenth (41.6%) among the constraints to national sector investment in Nigeriaøs agriculture. The constraint has as its elements high exchange rate, high interest rate, multiple taxation, poor trade policy, and policy inconsistencies. Multiple taxations were reported by the north-eastern and north-western zones as one of the main elements of macroeconomic constraint. This was expected, given the inter-state flow of agricultural commodities, especially staples and livestock products from the northern part of the country to the southern part. Policy inconsistencies

have been the bane of Nigeria's macroeconomic policies with a number of policy summersaults. A vivid example is the banning and unbanning of the importation of some agricultural commodities (e.g. rice, livestock, etc). Falusi (2005) noted that poor macroeconomic environment in terms of inconsistency contribute to farmers problems, limit their investment and profit. Minister of Agriculture and Rural Development, Adesina (2012) asserted that Nigeria in the last four years (2008-2011) had spent $1.6 trillion on the importation of rice, wheat, sugar and fish(www.thisday.ng. accessed March 2, 2012).

4.6 : **Hypotheses Testing Results** :

The first hypothesis sought to know if National investment and funding has any significance on agriculture share of the GDP. The t-test result (table 4.8) showed significant effects; viz:

a. ADP extension services had a high positive significant effect on agriculture output with a coefficient of 7493.6 and t-value of 2.078 which was significant at 5 percent probability level because calculated value of 2,078 is greater than critical or tabulated value of 1.69.

b. ACGSF was also positively related to agriculture output with a coefficient of 2.02211 and t-value of 2.6321 which is significant at 5 percent probability level.

c. Fertilizer used in metric tonnes also had a positive relationship with agriculture output based on a coefficient of 2.3916 and t-value of 2.5797 which was also significant at 5 percent probability level.

The second hypothesis sought to find out if there existed any significance difference between budgetary allocations to agriculture and other economic sectors in Nigeria. Table 4.11 showed the results of t-test (t   0.5) for mean difference between agriculture and other economic sectors of Nigeria .

Table 4.11 : T – test for mean difference between the budgetary allocations to agriculture
and other economic sectors of Nigeria(1970-2008).

S/no.	Economic sectors	t-calculated	t-tabulated	Decision rule
1.	Agriculture vs Defence	1.1167	1.895	Reject.
2.	Agriculture vs Education	-5.612	1.895	Reject
3.	Agriculture vs Health	1.923	1.895	Accept
4.	Agriculture vs Administration	-3.995	1.895	Reject

Source: Field Data Computation (2011).

Table 4.11 showed the t-test results at t =(t   0.5) 5 percent alpha level which indicated that there existed significant difference between agriculture and the following economic sectors: defence, education and administration. However, the budgetary allocation did not differ significantly between agriculture and health with calculated t-value of1.923 which is greater than critical t-value of 1.895 we therefore, accept the null hypothesis .

The other three economic sectors differed significantly with agriculture in budgetary allocations from 1970 to 2008 in Nigeria. The results showed the calculated t-values of 1.1167, -5.612 and -3.996 for defence, education and administration respectively differed significantly with budget allocations to agriculture because the t-calculated or critical value of 1.895.

The result agreed with Nwagbo (1998), Obadan & Olusola(2001) and okpukpara(2005),   that robust economic growth cannot be achieved without putting in place well focused programme to reduce poverty by empowering farmers through increasing their access to factors of production. The findings are also in tandem with the assertion by FAO(2002) that agriculture investment impacts on poverty reduction through direct effect on producers incomes, indirect effects on consumers welfare by lower food prices, employment , wage effects and growth induced effects throughout the economy. Thus , as agriculture budget allocations differed significantly with most Nigerian economic sectors, its impacts are not clearly seen in the aforementioned variables in Nigeria.

Finally, the hypotheses results (tables 4.8 and 4.11) showed that three (ADP extension services, Agricultural Credit Guarantee Scheme Fund and Fertilizer used) out of the five variables tested had significant effects on agriculture percentage share of GDP; and there existed significant difference in budgetary allocations to agriculture when compared with other economic sectors of defence, education and administration.

CHAPTER FIVE

5.0   SUMMARY, CONCLUSION AND RECOMMENDATION

5.1   Summary

Agriculture plays a key role in Nigeria's economic development as it has provided food, foreign exchange, industrial raw materials and reduced poverty. Several studies have examined the impact of public investment on agriculture and rural development; and showed that public spending on agriculture could positively contribute to rural development and poverty reduction. Nigeria expenditure on agriculture between 1980 and 1998(18yrs) rose from N528.6($9.5) to N44,130.3($20.2) billion and agriculture's percentage of GDP rose from 20.6 to 33.6 in the period(CBN,2006).

However, the identified study problem is that despite these huge agricultural investment and funding ,Nigeria is no longer able to produce enough food for her ever increasing population .I t is difficult to obtain a clear picture of Nigeria's total agriculture expenditure because few studies attempted to analyze the impact of government spending at the sector level, especially agriculture. There is also no available detailed analysis on the returns to agriculture in most African countries ditto Nigeria.

A wide gap was created by the declining output of major staple agricultural products, low agricultural share of GDP and high Nigerian population growth rate of 4.9 percentage (CBN,2006) .The import rate stood at 14 5% against 5%, as projected by National Economic Empowerment Development Strategy(World Bank,2008).

The broad objective of the study is to analyze National Funding and Investment in Nigerian Agricultural sector. Specific objectives include to ;evaluate fund allocations to Nigeria's economic sectors between 1970 and 2008;and determine difference in budgetary allocation among Nigerian economic sector and agriculture. Thirdly, determine effect of National funding and investment on agricultural share of GDP via ADP services, ACGSF value ,irrigation cost, rural roads cost/length, and metric tonnes of fertilizer used. Fourthly, to evaluate the effects of different economic regimes (pre and post SAP) on agriculture percentage share of the GDP in Nigeria. Finally, identify implementation constraints to national funding and investment in Nigerian agriculture. The study is significant which shows that the trend analysis of agricultural sector expenditure and investment will provide an indication of the long-run performance of the

Sector in Nigeria. However, getting time series data from states and local government areas of the country was very difficult.

The literature was reviewed under the following sub-headings: agricultural policies in Nigeria, government's budgetary allocation and agriculture in Nigeria, role of credit in agricultural investment, public investment on Research- technology and human Capital development, and empirical studies. Public investment in agriculture is the key to increase in the gross area under cultivation, enhancing productivity, skills in cropping pattern and income because omamo (1998) asserted that the Complementarity between public and private investment is most pronounced in agriculture.

Since 2004, Nigeria government has adopted budget and financial reform strategy with public finance regimes underpinned by the medium óterm expenditure framework(MTEF),due process, banking reforms ,and non-oil tax reforms.

The Harrod-Domar model of economic growth ,formed the theoretical study framework. The analytical framework followed the endogenous growth models of Barro (1990), Barro and Salai-martin(2004),and Gong   *et al* (2004). OLS regression was employed to analyse indicators of agricultural GDP to elucidate economic relationship between public investment and growth, such where output is a function of technology, labour, capital stock and government spending.

Nigeria is the study area. Nigeria has 36 state, and FCT Abuja divided into six geo ópolitical zones as; South-east, South-south, South-west, North-east, North- central and North-west. The study covered a period of 39 years from 1970 to 2008 and secondary data was used. Descriptive statistics and OLS were used to achieve analysis of research objectives. T-test was relied on in the analysis of the study hypothesis and complemented by ADF values.

Results showed that budget allocation and expenditure to and by the five economic sectors of agriculture, defence, education, health and general administration differed in various years as in table 4.1.There were variations in budget allocations to the economic sectors and an unsteady trend in the percentage allocation to agriculture which was 9.45 percent in 1970-1974 period lowered to 5 percent in 1975-1979 period and increased to 21.00 percent in 1980-1984 period. In the year 1985-1989, it declined to 15.00 percent and 8.00 percent respectively in 1990-1994, 1995-1999 with 8 percent. In 2000-2004 it peaked 30 percent and 21 percent between 2005-2008 as shown in table 4.2.

The effects of national funding and investment are evaluated on five variables Viz: ADP extension services, ACGSF value, fertilizer used, irrigation cost and rural roads

constructed on the share of agriculture GDP. The dynamic analysis of the impact of National sector investment on agricultural GDP is acceptable based on its significant f-ratio (30.0970),acceptable Dobbin Waston -statistics(2.02), relatively high Coefficient of Determination=R^2 (0.8621 or 86%) and significant variables whose coefficient are in consonance with basic economic concepts and theory.

Out of the five variables, three (ADP services, fertilizer use, and amount of ACGSF) had positive and significant effects on agriculture share of the GDP, while two (irrigation cost and rural roads constructed) are found to have no significance on agriculture percentage share of the GDP. The coefficient of ADP services is 7493.6 while its t-value is 2.0781 which are significant at 5 percent probability level. The implication is that since the inception of ADP (1986) services , agriculture GDP has been on the increase. Thus, the continuous use of the ADP extension services will lead to greater agriculture percentage share of GDP.

The quantity of fertilizer used in Nigeria is positively related to agriculture percentage of the GDP. The coefficient is 2.3916 and its t-value is 2.5797 which is significant at 5 percent probability level. This shows that the more the amount of fertilizer used, the higher the value of agriculture percentage share of the GDP.

Thirdly, agricultural credit guarantee scheme fund (ACGSF) had a positive relationship with agriculture percentage share of the GDP. The coefficient was 2.0221 while its t-value was 2.6321 which was significant at 5 percent probability level. The implication is that the more the value of ACGSF used, the higher the value of agriculture percentage share of the GDP.

However, the cost of irrigation and rural roads constructed are insignificant. Irrigation coefficient is 0.1986 with t-value of 0.6749 at 5 percent probability level. Irrigation investment has not therefore, significantly impacted on agriculture share of the GDP. The implication is that more needed to be done to harness the irrigation potentials of the country. Fadama 1 and 11 clearly demonstrated the critical role of irrigating farms in upwards shift of productivity and incomes with economic rate of returns of 40 percent compared to an estimated 24 percent at appraisal in Nigeria.

The impact of rural roads constructed on agriculture GDP is not significant as its coefficient value is negative (-0.08784) with t-value of -0.396 at 10 percent probability level. This implies that the amount of rural roads constructed is statistically insignificant to support agriculture -GDP growth. Poor rural roads and infrastructure raise Farm to market costs and reduce farm incomes while encouraging post-harvest losses and spoilage which lowers the share of agriculture percentage of GDP.

The effects of the various economic regimes were analyzed according to periods of pre-SAP, 1960-1980, SAP era 1981-1999, and post SAP 2000-2009. The result showed a positive effect of SAP on the percentage increase in agriculture share of the GDP from 20.6 in 1980 to 31.5 percent in 1990, 35.8 percent in 2000 and 42.1 in 2009.

Thirteen constraints are found to hinder the implementation of national funding and investment in Nigerian agriculture. Eleven of the thirteen were identified as major constraints to national investment in Nigeria's agricultural sector. In all, financial and infrastructure constraints seemed to be most critical. These were followed by economic and technical constraints, political, social-cultural, and environmental among others. However, the intensity differed across the six geo ópolitical zones of Nigeria.

5.2 Conclusion

Based on findings, the researcher concludes that economic evaluation of national funding and investment in the agriculture sector of Nigeria shows that there exist budget allocation variations in the five economic sectors (agriculture, defense, education, health and general administration) and the unsteady trend in the percentage budget allocation to agriculture being lower amongst the variables over a long period of time.

The analysis of national funding and investment in agriculture sector of Nigeria identified seven major constraints to implementation ie financial, infrastructure, economic, technical, political, socio-cultural, and environmental, among others which have underpinned the implementation across the six geo political zones.

Economic evaluation of the impacts /effects of national investment in agriculture share of GDP shows that out of the five variables examined ,three (ADP services, ACGSF amount, and quantity of fertilizer used) are positively and significantly correlated to the agriculture GDP in Nigeria, while two others (irrigation and rural roads) are highly insignificant.

5.3 Recommendations:

Based on the findings, the following recommendations are made:

i. Nigerian budget allocation to agriculture is less than the 10 percent NEPAD target of national budget and should therefore, be increased by act of legislation so that agriculture projects will be effectively implemented.

ii. The ADP extension service delivery is significant on agriculture share of the GDP. There is need for federal government to improve human capacity building on the ADP staff to increase their efficiency and agricultural output.

This will be done by regular re-training, research oriented trainings to combat weather and climate change, diseases and pests, desertification, land degradation, effective technology transfer, and adoption processes.

iii.   As financial access increases income through productive investment, spirited efforts by federal government should be made to increase the tempo of agricultural credit guarantee scheme fund in Nigeria. This will help create employment opportunities and lower the vulnerability of the poor by reducing the financial exclusion of the rural poor Nigerian population which stunts agricultural growth and development.

iv.   The data result shows a significant fertilizer use effect on agriculture share of GDP. However, there has existed inconsistency in Nigeria fertilizer policy. The cumulative fertilizer consumption in Nigeria between 1961 and 2001 was 6,469,200 metric tonnes while fertilizer production was 2,810,700 metric tonnes and the shortfall of 3,658,500 metric tonnes was imported. The policy recommendation is that the federal government should re óappraise fertilizer local production as to increase output of local plants and reduce fertilizer importation through the public-private-partnership strategy.

v.   There is need to re óappraise the federal government irrigation
development strategy to ensure state and local governments ownership,
efficiency, viability and sustainability by public óprivate-partnership. This will
harness the existing Nigerian irrigation potentials for all year round cropping.

vi.   Rural roads length constructed in kilometers have not significantly affected
the impact of agriculture share of GDP. The policy implication is that federal
government investment on rural feeder roads should be increased to make a
positive impact on agriculture output and its share of the GDP.

vii.   Inadequacy of time series data.

5.4.   **Major Contributions of the Study to Knowledge**

     This research has contributed by knowledge in several ways. Specifically, the study has:

i.   Provided knowledge that will facilitate the efficient and effective functioning of National funding and investment in agricultural sector of the Nigerian economy.

ii.   Made pioneering attempt at assessing the performance of National funding and investment from 1970-2008 in the agricultural sector of Nigeria economy

iii.   Established empirically the variables (ADPs extension services, ACGSF funds and fertilizer use) that were positive in contributing to the growth of agriculture percentage share of GDP in Nigeria.

iv.   Explored theoretically and empirically the frameworks for linking National expenditure, investment and agriculture output in GDP estimates.

v.   Provided data to be available for further studies on National funding and investment in the agricultural sector of Nigerian economy.

vi.   Identified those variables: irrigation expenditure, rural feeder roads density and cost which were negative and needed strengthening to increase their relevance and relationship to agriculture GDP growth in Nigeria.

5.5 Suggestion for further Research:

Based on the findings, conclusion and recommendations, the researcher suggests the followings for further research:

i.   The problems associated with the implementation of irrigation projects in Nigeria.

ii.   The strategies for increased participation of the three tiers of governments and private sectors in rural roads construction in Nigeria.

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APPENDIX 1 : t-test calculation for hypothesis testing .

i.   difference between percentage Agriculture & defence budgets 1970-2008.

$$ t = \frac{\sum d}{\sqrt{\frac{N\sum d^2 -(d)^2}{N-1}}} $$

Years	Economic sectors		d	d²
	Agriculture	Defence		
1970-74	9.45	50.30	-40.85	1668.7225
1975-79	5.00	34.00	-29.00	841.00
1980-84	21.00	26.00	-5.00	25.00
1985-89	15.00	25.00	-10.00	100.00
1990-94	8.00	18.00	-10.00	100.00
1995-99	8.00	16.00	-8.00	64.00
2000-04	30.00	8.00	22.00	484.00
2005-08	21.00	6.00	15.00	225.00
∑x	117.45	183.00	-65.85	3584.7225
.x	14.68	22.88		

$$ t = \frac{-65.85}{\sqrt{\frac{8 \times 3584.7225 - 65.85}{8-1}}} $$

$$ = \frac{-65.85}{\frac{8 \times 3584.7225 - 65.85^2}{8-1}} $$

= 28677.78- 4336.2225 =√ 24341.5575/7 = √3477.365357=   58.9691899/=

65.85/

58.9691899.

= 1.116684833 vs t-critical value 1.895 . Decision Rule . Reject null hypothesis since tabulated ót is greater than t-calculated.

ii.   difference between percentage Agriculture & Education budgets (1970-2008).

$$ t = \frac{\sum d}{\sqrt{\frac{N\sum d^2 -(d)^2}{N-1}}} $$

Years	Economic sectors		d	d²
	Agriculture	Education		
1970-74	9.45	16.74	-7.29	53.1441
1975-79	5.00	22.00	-17.00	289.00
1980-84	21.00	21.00	0.00	0.00
1985-89	15.00	27.00	-12.00	144.00
1990-94	8.00	17.00	-9.00	81.00
1995-99	8.00	17.00	-9.00	81.00
2000-04	30.00	9.00	21.00	441.00
2005-08	21.00	10.00	11.00	121.00
∑x	117.45	139.74	-89.00	1210.1441
.x	14.68	17.47		

.t cal=

$$.t = \frac{-89}{\sqrt{\dfrac{8 \times 1210 .1441 - 89^2}{7}}} = \frac{-89}{\sqrt{\dfrac{9681.1528 - 7921/7}{}}} = \frac{1760.1528/7}{} = -$$

89/15.85718764= -5.612= t-calculated vs t-critical value of 1.895. **Decision Rule**. Reject null hypothesis since tabulated ót is greater than t-calculated.

iii. difference between percentage Agriculture & Health budgets (1970-2008).

$$.t = \frac{\sum d}{\dfrac{N\sum d^2 - (d)^2}{N-1}}$$

Years	Economic sectors		d	d²
	Agriculture	Health		
1970-74	9.45	2.13	7.23	53.5824
1975-79	5.00	1.00	4.00	16.00
1980-84	21.00	10.00	11.00	121.00
1985-89	15.00	12.00	3.00	9.00
1990-94	8.00	10.00	-2.00	4.00
1995-99	8.00	8.00	0.00	0.00
2000-04	30.00	4.00	26.00	676.00
2005-08	21.00	21.00	0.00	0.00
∑x	117.45	68.13	49.32	879.5824
.x	14.68	8.52		

$$.t\ cal. = \frac{49.32}{\sqrt{\dfrac{8 \times 879.5924 - 49.32^2}{8-1}}} = \frac{7036.7392 - 2432.4624}{\sqrt{\dfrac{4604.2768}{7}}} = \frac{49.32}{25.64671185} =$$

t. cal.= 1.923 vs . t-critical value at 5% = 1.895. **Decision Rule**. Accept null hypothesis since tabulated ót is smaller/lesser than t-calculated.

APPENDIX 2 :Hypothesis testing for difference between agriculture and other economic sectors

Variables	ADF	Remarks
D ACGSF	-2.2946	Ns
DLAG_GDP	-3.9640**	5% sig
DFERT_ME_1	-4.7877**	5% sig
DIRREGAT_1	-3.5865*	10% sig
DRURAL_R_1	-3.5809*	10% sig

Critical values: 5%=-2.966 1%=-3.675; Constant included

Source: Field data (2011).