

*Review*

# A review of government policy on agricultural mechanization in Nigeria

**R. O. Akinbamowo**

Ondo State Ministry of Agriculture, Akure, Ondo State, Nigeria.

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**The paper reviewed the scope, objectives and performance of the previous Nigerian Government policy on agriculture with specific consideration for components of the policies that concern the agricultural mechanization subsector. The views of previous researchers on the performance of previous policies were reviewed to demonstrate the loopholes within the extant document. Similarly available secondary data indicated that the existing policy framework have hitherto not adequately supported the growth of the sector. The paper concluded by providing fresh focus areas that will make a new policy to be more vibrant and supportive of an efficient multi-sectoral agricultural production in the country.**

**Key words:** Government, agricultural mechanization, agricultural policy, agencies, programs.

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## INTRODUCTION

In simple terms agricultural mechanization is the replacement of human and animal labour by mechanical devices in farming activities. According to Simalenga (2000), agricultural mechanization should be taken in its broadest sense, embracing the manufacture, distribution and operation of all types of tools, implements, machines and equipment for agricultural land development, farm production and crop harvesting, and primary processing. These definitions of mechanization, however, are in contrast to the concept of many who erroneously take mechanization to mean the application of engineering principles to crop production only.

The purpose of agricultural policy is the development of favourable and sustainable guidelines for the promotion of efficient agricultural practices that will guarantee food security, provide employment for the citizens, raw material for all agro – based industries as well as to earn foreign exchange. It is the synthesis of the framework and action plans of government designed to achieve overall agricultural growth and development (FMA, 1989).

This usually entails the upgrading of infrastructures and infusion of technology to advance production from the primitive farming stage to fully mechanized systems through an appropriate policy framework so as to discharge constitutional duties to the populace.

## OBJECTIVES OF AGRICULTURAL POLICY

According to the FMA (1989), the broad objectives of Federal government policy in agriculture so far are summarized as follows:

1. Production of food, adequate in quantity and quality to meet the population growth;
2. Production of raw materials for local agro- industries and for export to earn foreign exchange;
3. Modernization of agricultural production, processing, storage and distribution through the infusion of improved technologies and management, so that agriculture can be

more responsive to the demands of other sectors of the Nigerian economy;

4. Provision of gainful employment for the majority of the rural population;
5. Protection and improvement of agricultural land resources and preservation of the environment for sustainable agricultural production.

To achieve these objectives, agricultural policy is usually supported by sub-policies that facilitate the growth of each sector of agriculture. It cannot be overstated that for the objectives of agricultural policy to be fully achieved, the mechanization sub sector has a vital role to play.

The aim of this paper is to make a brief review of the policies of the Nigerian government on agriculture and to determine its effects on agricultural mechanization and by extension agricultural productivity in the country.

## **HISTORICAL PERSPECTIVE OF AGRICULTURAL POLICY**

According to Prabuddha and Babu (2010), Agricultural policies in Nigeria have undergone four main phases: The first from 1960 to 1969; the second from 1970 to 1979, the period of the oil boom; the third from 1980 to the late 1990s, during the structural adjustment program (SAP); and the current NEEDS framework. After independence agriculture provided most of the country's food, earned most of the foreign exchange and generated a substantial proportion of government revenue at the early stages of economic development in Nigeria. The abundance of food and cheap labour in the rural settings across the nation during this period resulted in complacency on the part of the government thereby putting the enactment of a virile and strong policy in the doldrums for decades. Hence, government efforts to develop agriculture at this stage concentrated more on the production of cash crops like groundnut and cotton (in the north), cocoa and coffee (in the west); and palm produce and rubber in the east in part to satisfy the demands of our colonial administrations of cheap sources of exportable raw materials for their industrial growth.

The mild food scarcity of 1960 to 1970 stirred up the government to concentrate briefly on food production. This was evidenced in the planned expenditure (PE) of 1962 to 1968 when 9.8% of the PE was allocated to the entire agricultural sector. Between 1970 and 1982 agricultural growth stagnated at less than 1% with sharp decline in the production of export crops. Similarly, per capital calorific food supply declined from surpluses in the 1960s to a deficit of 38% in 1982 when Nigeria turned a net importer of vegetable oil, meat, dairy products, fish and grains, notably rice wheat and maize with the food import bills rising astronomically (FMA, 1984, 2001). The factors responsible for this trend in agricultural growth of the economy was identified by FMA (1984) and grouped under two major classes namely:

1. Demand side factors and
2. Production side factors.

On the demand side, the main contributory factors were the high rates of population growth, per capital real income and urbanization deriving from high rate of rural urban migration. During this period the economy recorded an urban population growth rate of 4.7% per annum as against 1.95% per annum in the rural areas FMA (1984). On the production side, many fundamental problems arose from farm resource constraints, especially labour and capital availability, poor production technology, poor storage, poorly developed marketing systems and the past neglect of agriculture in development planning.

Consequently, to curtail the aforementioned problems, government rolled out a plan of action which was basically policies designed to stimulate the growth and development of agriculture to positively impact on the overall growth of the Nigerian economy. They include such policies as the restructuring of marketing board system for export crops, creation of marketing boards for grains and root crops. This and subsequent policies also have broad components for implementation amongst the federating units and the private sector.

## **ROLES OF TIERS OF GOVERNMENT**

The Nigerian Federal constitution has divided responsibility for agricultural development among the three tiers of government (federal, states and local governments) and these are contained in the exclusive and concurrent legislative lists. The Federal government's roles are mainly in three forms:

1. Developmental roles
2. Supportive roles
3. Service delivery roles

Of interest are those policies that have direct effect on mechanization.

### **Federal government**

Demand-driven agricultural research including bio-technology to continually increase the yield of crops:

1. Support to rural infrastructural development;
2. Development and maintenance of large dams and their auxiliary infrastructure and provision of support to state and local government in the development and maintenance of small and medium scale dams for maximum use of irrigation water;
3. Maintenance of strategic National Food Reserve for the purpose of food security;
4. Promotion of agro-industrial development.

**State governments**

1. Promotion of primary production of all items of agricultural produce;
2. Development and management of the irrigation areas of large dams;
3. Management of impounded water and downstream structure of large dams;
4. Promotion of appropriate farm mechanization;
5. Investment in rural roads and water supply;
6. Training and manpower development.

**Local governments**

1. Provision of rural infrastructure;
2. Management of irrigation areas of dams;
3. Provision of land for farming activities within the provision of the land use act.

**Private sector**

1. Agriculture produce storage, processing and marketing;
2. Agricultural mechanization;
3. Support for research in all aspect of agriculture.

According to F.M.A (2001), a critical appraisal of the performance of the mandate of the three tiers of government in previous development plans reveals the existence of role duplication and overlapping of functions. Efforts have been made in the subsequent National Policy adopted in October, 2001 to re-define roles and remove such functional muddles to enhance efficiency.

**STRATEGIES FOR IMPLEMENTATION**

FMA (1984, 1989, 2002), comprehensively discussed the various strategies that have been adopted by the government in implementing mechanization policies. These include:

1. Supervision, monitoring and subsidizing agricultural land clearing by state government.
2. Establishment of tractor hiring unit (THU) and repair workshop by state governments with the aims of encouraging mechanized farming by peasant farmers. Although the ultimate goal is to promote privatizing THU's in assisting entrepreneurs to secure capital for private mechanization enterprises Provision of adequate training for various tractor and machinery operators for effective machine handling, soil and water conservation.
3. Introduction of low horse power and low cost 4 – wheeled tractor.
4. Equipment fabrication and distribution at subsidized

rate. This includes their standardization by specialized institution like (NCAM).

5. Promotion of animal traction and development of appropriate hand tools for agricultural production.
6. Strengthening of existing institutions and encouragement of private sector to invest in farms tools and equipment fabrication and marketing.
7. Development of simple processing and storage technologies for agricultural produce to reduce post – harvest losses.
8. Provision of necessary infrastructure to the rural areas through the national policy on integrated rural development to attract private sector.
9. Promotion of existing agro – processing facilities available in the country by enlightening small investors with the potential economic opportunities that exist in simple cottage agro – processing activities.
10. Provision of water from reservoirs and lakes for irrigation purpose to farmers and other groups of people as well as for urban water supply schemes;
11. Comprehensive development of both underground and surface water resources for multi – purpose use.
12. Retention of all existing agencies for water resources development and exploitation such as the River basin Development authorities, state water boards, and so on, and streamlining their operation to make them efficient and effective.
13. Provision of adequate funds and support for existing Rural Agro –Industrial development Scheme (RAIDS) to undertake more research into low cost and adoptive small – scale agro – processing machines.
14. Rehabilitation of farm machinery.

In implementing these policies on agriculture, government set-up various programmes or agencies mandated with the execution of specific components of its agricultural development policies. FMA (1984, 1989, 2002) listed such institution to include:

1. Operation Feed the Nation (OFN): The aim of the programme was to mobilize the general populace and create an increased awareness for agricultural pursuit.
2. Green Revolution: This programme was designed to effectively implement the objectives of the OFN.
3. Agricultural Development Projects (ADP): Jointly funded by the World Bank, the Federal Government and the State Government, ADP's objective was to promote integrated rural development by providing facilities for intensive agricultural extension services, modern input and distribution system, and rural infrastructure, especially rural feeder roads.
4. National Accelerated Food Production Programme (NAFPP). The main emphasis of the programme was to increase the production of grains and cassava through enhanced farm productivity brought about by adequate supply of improved input packages and crop processing and storage facilities.

5. Agricultural Development Authority (ADA): This was a complementary programme to ADP designed to reach the people at the grass root. That is, those area not covered by the ADP such as the local Government Area (LGA).

6. River Basin Development Authorities: Eleven River Basins Development Authorities were created through decree No 87 Of 1979. Initially, their activities cut across most area of agriculture development but the mandate was later reduce to cover only water resource development / maintenance of irrigation, dams etc.

7. Federal Ministry of Agriculture parastatals like:

a. National Center for Agricultural Mechanization (NCAM) saddled with the testing, standardization of farm machinery and equipment and the promotion of locally designed prototypes.

b. National grain production company

c. National root crops production company

d. Nigerian beverages production company

8. Specialized institutions like

a. Universities of technology

b. Universities of Agriculture

c. Colleges of Agricultures

9. Research institutes to be coordinated by Agricultural Research council of Nigeria.

10. NALDA, DIFFRI, FADAMA etc.

A critique of the extant policy (Ogboru, 2002) noted that apart from the different funding agencies, the objectives of the programs are more or less the same; self sufficiency in agricultural production. The inputs were basically the same; improved seedlings and chemicals, fertilizers, machinery, extension service and training as well as credit. All the projects did was to marginalize and dislocate the peasant farmers. In fact many of the projects are deviations from extant policies.

Reviewing the performance of agricultural sector, Idachaba (1989) reported lack of functional integration between Ministries of Agriculture at State and Federal levels, and also lack of horizontal integration and definition of appropriate roles between line ministries at the Federal level leading to institutional ambiguity and role confusion. He further noted that joint Federal – State programmes have often favored the creation of semi autonomous project management units outside the mainstream Ministry of Agriculture because the Federal government finds it institutionally tidier.

Grandval and Mathilde (2011) in its review, remarked that policies are opportunistic, uncoordinated without plans for continuity such that successes, failures and lessons learnt in preceding programmes have not been analysed. It noted for instance that subsidy for inputs have been a central element of Nigeria agricultural policy

since 1950, however the application of subsidies have followed a spiky path with highs and lows and variable methods of implementation from 10 to 50% between federal and State Governments. Even with this, many farmers still find it difficult to get inputs as and when needed due to poor regulation and monitoring to prevent diversion outside the country.

Furthermore, Iwuchukwu and Igbokwe (2012) identified nine gaps in the development of national agricultural policy chief among them is that policies have no specific objectives, strategy, targets and most importantly programme or projects geared towards accomplishment of the goals. Sometimes, agricultural programmes/projects are not consequences of agricultural policies. Other gaps identified are non interaction between and among stakeholders, role conflict between different programmes and projects, short duration of agricultural policies and programmes, incompatibility of regional policies/programmes with the national policies/programmes, emphasis on mainly food and animal production, inadequate virile technical advisory/extension services, inadequate monitoring and evaluation of programme/project as well as delay, embezzlement, misappropriation and lack of fund to pursue specific programme to an expected end.

## **APPRAISAL OF THE IMPACT OF AGRICULTURAL POLICIES ON NIGERIAN ECONOMY**

The response of the Nigerian economy to the various agricultural policy measures enumerated above has been mixed. As discussed above between 1970 and 1982 agricultural growth rate stagnated at less than 1% with sharp decline in the production of export crops (Table 1). During this period, Nigeria turned a net importer of agricultural produce as indicated in Table 2 (FMA, 1984).

Furthermore, the performance of the sector was undermined by other unfavourable policies created by the macroeconomic environment; specifically the introduction of the structural adjustment programme (SAP) which placed ban on the importation of some food items in order to increase the output of local products. This negatively affected the growth of animal production sector (fishery and poultry) because of the resultant exorbitant cost of inputs due to devaluation of currency, which was one of the features of SAP. Removal of subsidies on farm inputs like fertilizers also increased the production cost thereby reducing the profit margin of agricultural activities leading to reduction of farm holdings and enterprises.

Despite the enumerated constraints above, the performance of agriculture in the post SAP era 1989 to 1997 through to 2000 was one of unsteady progress in production, growth rate and contribution to the Gross Domestic Product (GDP), although the sector generally maintained a lead in the non oil sector (Table 3).

**Table 1.** Trend of agricultural export performance in Nigeria, 1975 to 2005.

Year	Volume of agricultural exports ('000 tons)	Value of agricultural exports (million naira)	Agricultural share in total export earnings (%)	Share of agriculture in non-oil export (%)	Share of agriculture in GDP (%)
1970	1,087.0	265.2	29.7	70.9	41.3
1971	779.3	242.8	18.1	66.7	35.9
1972	870.0	172.0	12.0	68.6	31.5
1973	1,094.7	250.1	10.5	68.8	27.6
1974	789.6	276.0	4.5	64.2	27.5
1975	527.0	230.6	4.5	65.9	25.5
1976	566.6	274.1	4.3	64.4	22.3
1977	407.1	375.7	4.7	71.8	22.4
1978	287.6	412.8 6	6.2	65.8	21.9
1979	306.2	468.0	4.6	69.8	19.2
1980	240.7	340.1	2.4	61.3	23.4
1981	127.4	178.4	1.6	52.0	34.8
1982	182.9	198.6	2.4	97.7	35.75
1983	222.2	431.2	5.7	72.6	37.6
1984	157.7	208.8	2.3	84.4	49.4
1985	166.1	259.8	2.2	52.3	40.3
1986	242.8	407.4	4.6	73.8	42.8
1987	332.5	1,588.5	5.2	73.8	41.8
1988	497.4	1,780.4	5.7	64.6	41.5
1989	354.1	2,131.1	3.7	72.1	40.5
1990	318.2	2,429.3	2.2	74.5	39.6
1991	296.1	3,425.0	2.8	73.2	37.8
1992	366.5	3,054.9	1.5	72.3	38.4
1993	422.9	3,437.3	1.6	68.9	37.8
1994	263.2	3,818.8	1.8	71.4	38.1
1995	304.1	15,512.0	1.6	67.2	38.6
1996	174.8	17,202.0	81.3	73.7	39.0
1997	691.4	19,826.1	1.6	67.0	39.4
1998	295.1	16,338.9	2.2	48.0	40.2
1999	397.3	12,204.9	1.0	62.6	40.8
2000	407.2	9,322.2	0.5	37.5	40.4
2001	417.0	7,961.4	0.4	28.4	40.3
2002	426.9	26,955.8	1.4	28.4	40.8
2003	436.7	20,597.4	0.7	21.7	40.3
2004	446.6	30,777.2	1.0	27.1	39.8
2005	456.4	38,588.1	1.2	48.1	41.2

Source: Daramola et al. (2007).

The average growth during this period was 4.0% although agriculture still accounts for 88% of the non oil foreign exchange earnings and employs about 70% of the active labour force of the population (FMA, 2001). The sector also became a major source of raw materials and catalyst for the take off of the industrial sector.

Viewed against the population growth rate of 2.83% (FMA, 2001) the agricultural growth rate which is higher than the population growth rate has continued to

guarantee the sector's ability to meet the demands on it for food, although this increase in agricultural production cannot be excised from the readiness of the peasant farmers to adopt new system of farming viz-a-viz: Mechanization which has been on the increase in the recent years, the bulk source of power in average Nigerian farm is still human. A comparative appraisal of nine countries performance on Table 4, relates the means of the production indicators; rural population,

**Table 2.** Food supply and demand in Nigeria (1996-2008) (MILLION MT).

Description	Year					
	2003	2004	2005	2006	2007	2008
Production	109.65	110.12	114.00	115.82	118.42	124.32
Food demand	113.33	115.48	119.12	116.21	118.61	124.47
Deficit/ surplus	(3.68)	(5.36)	(5.12)	(0.39)	(0.19)	(0.15)

Source: Ojekunle (2011).

**Table 3.** Structure of economy, 1974 to 2004 (percentage of GDP at current factor cost).

Variables	1970	1980	1990	2000	2003	2004
Oil sector	6.0	29.1	39.3	48.2	44.6	48.2
Non-oil sector	94.0	70.9	60.7	51.8	55.4	51.8
Agriculture	41.3	20.6	29.7	26.3	26.4	16.6
Industry	7.8	16.4	7.4	4.5	4.8	8.7
Services	45.0	33.8	23.6	21.0	24.2	26.5

Source: National Bureau of Statistics/IMF in Daramola et al. (2007).

**Table 4.** Comparative appraisal of four production indicators.

Country	Rural population	Arable land % of land area	Arable land/Person	Agricultural tractors
Bulgaria	2,505,616.53	31.85	0.44	102.26
Burkina Faso	9,742,229.74	15.25	0.36	12.27
Burundi	5,945,570.45	37.58	0.15	1.76
India	734,470,693.33	54.26	0.16	129.62
Malawi	10,027,177.14	29.41	0.23	5.16
Nigeria	71,774,534.84	32.94	0.24	6.47
Pakistan	92,220,781.33	27.68	0.15	159.05
Slovak Republic	2,354,014.01	31.25	0.28	156.42
Thailand	42,967,470.83	30.73	0.25	285.75

Source: FAO (2010).

arable land per person, arable land % of land area to tractors per 100 km<sup>2</sup> of arable land for the period 1999 to 2001 (FAO, 2010). This statistics show that Nigeria is behind six of the developing countries compared including India, Bulgaria and Burkina Faso. It is also remarkable that current FAO statistics (FAO, 2010b) put Nigeria's food import bill at 763 million US Dollars while the net trade in food is -3706 million dollars.

#### CONSTRAINTS TO ACHIEVEMENT OF POLICY OBJECTIVES

Some fundamental weaknesses that impede the effectiveness of agricultural mechanization policies and program implementation have been identified in Ademosun (1990) and FMA (2001), they include:

1. Hostile environment where macro – economic policies and the agricultural policy are in disharmony thus resulting in escalating costs of production and reduced purchasing power of farmers.
2. Inconsistency and instability in macro – economic policies which discourage medium and long term investments in agriculture.
3. Poor state of rural infrastructure.
4. Lack of appropriate indigenous technology to reduce the drudgery in agricultural production and processing activities.
5. Inadequate technology
6. Inadequate database for policy formulations, monitoring and evaluation as well as impact assessment.
7. Poor translation and articulation of policy prescription into implementable programme
8. Lack of involvement of beneficiaries in programme

designs monitoring and evolution and implementations arising from under-rating of the knowledge, ability, capability and sensitivity of the small scale farmers.

9. Lag between project costs and budgetary provision resulting in sub-optimal allocation.

10. Fragmentation of farmlands into small unit which are sometimes far apart.

11. Cropping systems not often adequate for mechanizations.

## POTENTIAL AGRICULTURAL MECHANIZATION POLICY FOCUS AREAS

The philosophy in practice worldwide is that national governments provide the basic conditions and act as catalyst to promote a self-sustaining development of agriculture including the sub-sector of mechanization. Therefore in order to properly position the agricultural sector to confront the daunting challenges of the 21<sup>st</sup> century, the government should redirect policies and provide strategic assistance to strengthen the growth of agricultural mechanization sub sector in the following main areas:

1. Land tenure and reform programs to ensure ready access to mechanizable land.
2. Subsidies and Price support for Tractor ownership and management. Even though the extant policy on tractor and equipment use have been towards the establishment of private sector led THUs. In practical terms, it is seldom to see entrepreneurs come quickly forward to fill the gap especially in situation where government has been heavily involved. The development of the private sector to sustain the mechanization efforts, therefore, requires programs, policy incentives and government assistance (Simalenga, 2000).
3. Technical assistance especially in categorization and standardization of tools, machinery and technologies to prevent farmers from purchasing unreliable equipment.
4. Guidelines and standard for Tractors and equipment safety
5. Policy guidelines on equipment for animal husbandry mechanization such as milk collection and processing equipment, egg collection and cleaning, feeders, drinkers and dung cleaners
7. Post harvest technologies and on farm storage systems, and
8. Advancing policies to support Agriculture led entrepreneurship, that is, small and medium scale agro industrial development.

These measures among others will ensure a proper place for the mechanization subsector to grow in *pari pasu* with other branches of the agricultural sector instead of the current scanty mention it has hitherto received in the extant policies. In addition community driven development (CDD) has now become the acceptable

model for sustainable agrarian development, subsequent policies may tap into the ideas of the new paradigm shift through the concept for community farms advocated in Adama et al. (2009).

In other to solve the protracted problem of inadequacy of farm machinery, the Indian approach, which has been yielded considerable result, is recommended for this country. Under this approach, a comprehensive inventory of the existing indigenous tools and implement must be taken. The implements should then be subjected to rigorous testing and improvement in order to increase their efficiency in fields. In this way we would build up a ready-made source of usable indigenous tools to enhance our agricultural activities. However, as noted in Ogunlowo (2003) for any such technology to be adoptable, it must be simple and appropriate for the job, it must be profitable and affordable to the users and it must be environmental friendly.

## CONCLUSION

From the fore going, it can be seen that over the years little in term of policy guidelines have been formulated to achieve the objectives of effective agricultural mechanization process in the Country. Notwithstanding this, there have been several programs and projects that have been created to improve agricultural productivity each with different implementation challenges. As a consequence of this, peasant farmers using primitive tools still constitute the bulk of producers of the food crops consumed in the Country. It is hoped that with continuous and stable democratic structures and the institution of better outlined policies, the elimination of these constraints will eventually translate to better implementation of projects for the development of the sector and overall national growth.

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