

AGRICULTURAL POLICY DIRECTION IN NIGERIA FARM MECHNIZATION AND POST- HARVEST LOSSES: A NEW THINKING.

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Introduction

Trends in farm mechanization worldwide clearly show that there are strong correlations between economic growth and mechanization (FAO and UNIDO, 2008). Those countries that have achieved unprecedented economic growth over the past decades and have succeeded in solving their food security problems have also advanced to higher levels of mechanization in their agriculture. On the other hand, countries that have stagnated economically with significant numbers of their citizens in abject poverty have also lagged behind in agricultural mechanization. Considering the trends in mechanization for the past decades and the increasing globalization of the world's agricultural economy, a key question that arises is whether Sub-Saharan African (SSA) countries, particularly Nigeria can realistically achieve a significant turnaround in development and growth with agricultural sectors that rely to a high extent on human muscle power and hand tools. Farm mechanization has been helpful to bring about significant improvement in agricultural productivity.

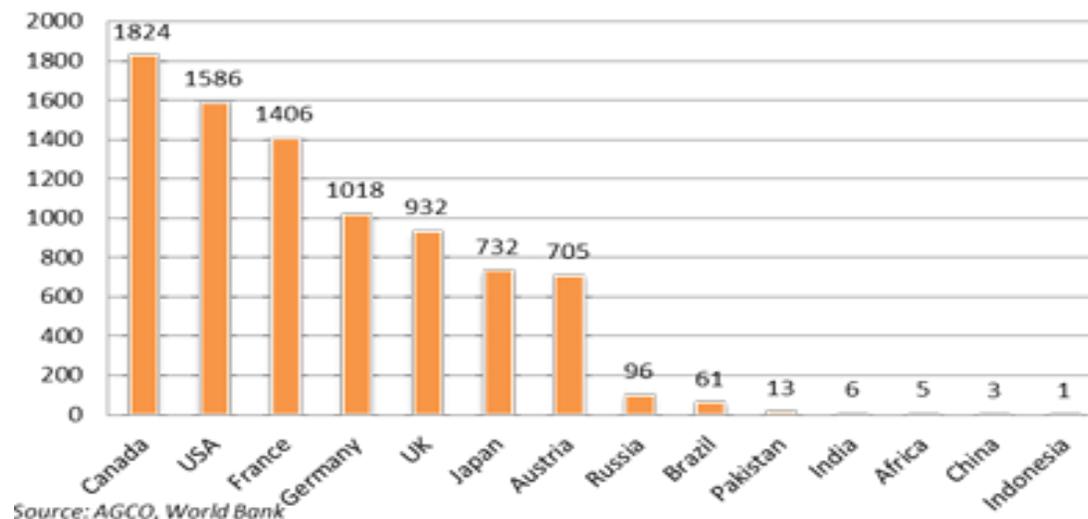


Fig. 1 : Number of tractor per 1,000 farmers and agricultural workers

Figure 1 above shows clearly the state of African continent global farm mechanization with just 5 tractors per 1000 farmer of farm workers as compare with Canada with 1824 tractors per 1000 farmers. The case of Nigeria is more pathetic with over 80% field operations engaged in hoes and cutlasses.

It is painful to say, that from the days of independence till date in Nigeria, we are still yet to practice modern agriculture in the right sense of the word; rather, we have been engaged majorly in traditional farming. The evidences are not farfetched. That over 70% of our adult work force is still engaged in the agricultural space, indicates that we are still into crude farming methods, rather than practise modern agriculture. There shouldn't be more than 10% of the population engaged in the sector in this century. Again, if you take the statistics of tools employed in our farming field operations, you will discover that over 80% are made up of cutlasses and hoes. In spite of the huge amount of money that government at various levels have expended in acquiring machinery like tractors, combined harvesters and other machines for production and processing from Europe and America. Just take a trip to any part of this country where farming is done, the tools you see are majorly cutlasses and hoes.

Modern agriculture is science; it is about technology, about skills, expertise and knowledge driven. Agriculture should not be labour-intensive or practised as a backup business in the 21st century. Unfortunately, the actors on the field right now in Nigeria do not have the requisite skills and knowledge for mpdern agriculture; reason why the heavy dependence on cutlasses and hoes in their work.

The Agricultural mechanization disconnect in Nigeria

Agriculture in Nigeria is dominated by smallholder farmers with low capital, limited technical know-how and limited infrastructure leading to low crop production. The major factors that have hindered the development of agricultural mechanization in Nigeria include:

i) Fragmented lands not suitable to mechanization

The total holding of land is not located in one place, rather, it is found in split plots in several places with small sizes. This restricts power operated tilling, seeding and harvesting machines to perform at optimal efficiency. Even two

wheel tractors, reapers and combines face tremendous problems from frequent turnings in such fragmented lands.

ii) **Poor purchasing capacity of farmers**

The rural people are mostly poor and hardly can buy a costly machine individually. Some resource endowed farmers having a large quantity of agricultural lands possess some costly machines like, tractors, power tillers, power tiller operated seeders, and combine harvesters. They use these machines in their own lands and also operate them on hire basis in others' lands and earn a substantial return. But, the number of such farmers is very limited.

iii) **Lack of quality machines**

Due importance was not given to farm mechanization until the beginning of the century. Earlier, only a few manufacturers came up to fabricate simple manually operated machinery like weeder, thresher, winnower and planter. With the growing needs for foods, the decision makers got the realization that Nigeria agriculture will have no other alternative than to adopt mechanized cultivation to feed her ever growing population. This helped grow some agricultural manufacturing workshops in the country. Many small workshops are manufacturing sub-standard machinery creating adverse impact among the farmers. These small workshop owners, in general, do not use jigs and fixtures and produce different standard machines. They get the prototype from the designers and multiply them. While copying these machines, they do not use exact quality materials and specifications thus producing low quality machines.

iv) **High cost of agricultural machinery:**

The cost of agricultural machinery has risen in recent years due to high inflation rates making it difficult for majority of farmers to afford them.

v) **Low purchasing power of farmers:**

There is threat of hunger and 70 percent of Nigerian population live on less than N100 (US \$0.6) per day. Smallholder farmers' production system is inefficient and there is regular shortfall in domestic crop production with low incomes that limit their purchasing power.

vi) **Low technical knowledge of farmers:**

Most farmers, operators and mechanics who handle agricultural machinery do not acquire adequate technical knowledge. Hence, there is frequent breakdown of machines and implements.

vii) Importation of low quality farm machinery:

Most of farm machinery imported into Nigeria are of low quality and they cannot stand the rigour of tropical climate. They meet soils which may be drier and harder or wetter and stickier than in their countries of origin. Many of the Nigerian soils are so fine in texture that they are almost colloidal and the fine dust are often very abrasive and permeates every small opening in machines and implements. Parts such as wheels, steering bearings, engine cylinder blocks, pistons and machine parts quickly show rapid wear even when what is considered adequate protection for overseas conditions have been given to them. Such equipment is not efficient and are abandoned after few years of usage due to spoilage.

I believe strongly that if we must fix our agriculture and to strengthen food security by having enough to eat and export, as well as to generate and create employment, we must begin to do things differently. Such a move must look into the area of mechanisation. When I say focus on 'mechanisation', I am not talking about going to Europe, America or Asia to import combined harvesters, tractors and other heavy machinery, which are often not suitable for our farm lands. Also, our actors on the field are not skilful enough to manage such equipment; and therefore, they end up being abandoned, becoming huge waste of scarce fund and economic resources. Such wasteful spending has happened several times in the past, under sundry procurements by government, using agricultural development programmes (or ADPs, as they are generally known); so many tractors and other farm machinery were abandoned because the farmers did not have the skills to use and maintain them.

My idea of mechanisation of Nigerian agriculture is simple: that we should look inwards to develop a sustainable approach to mechanisation. The country already has a National Centre for Agricultural Mechanisation (NCAM) in Ilorin, with a mandate to design and fabricate simple labour-saving devices that can be used by Nigerian farmers. NCAM was established in 1990 to develop and promote mechanization technologies for the transformation of the nation's agriculture. Its

specific functions include: to encourage and engage in adaptive and innovative research towards the development of indigenous machines for farming and processing techniques; to design and develop simple and low-cost equipment which can be manufactured with local materials, skills and facilities; and bring into focus mechanical technologies and equipment developed by various institutions, agencies or bodies and evaluate their suitability for adoption. The Centre has a good number of products on their shelves, but rather than give them attention, we are focusing on importation of machinery. Thus, this critical agency that is supposed to transform and modernise the sector is not put to optimal use. My idea and thinking of reducing cutlasses and hoes in our farming space is to look inward and focus on such centres as NCAM and others that can design and fabricate simple farm labour-saving devices.

The use of crude implements, such as cutlasses and hoes, makes farming very unattractive, especially to the youths. Again, the present actors on the fields are aging out; we must begin to prepare for those that will replace them. We may never get the youths involved if we continue the way we practice agriculture. Moreover, this traditional (crude) method of farming can never ensure massive production that is necessary for achieving food security, employment generation and economic prosperity.

Consequently, we must turn to NCAM, to dust up the different prototypes of labour-saving devices available; pick the appropriate ones, put them to test and get them adapted. Then we go into the mass production of these devices. I learnt that the mandate of NCAM is just to produce prototypes; that it is not their duty to mass-produce. Indeed, the responsibility of commercial production is for the industries; hence, I will suggest that there should be deliberate efforts for public-private partnership in the commercial production of such technologies. Nigeria is already blessed with some automobile industries, such as Innoson and PAN, which produce cars, trucks, logistics vehicles and military hardware and other government agencies such as Federal Road Safety Corps. The principle for automobile production is the same, whether it is for a trailer, tractor or car. I believe that if these local automobile companies are given the necessary policy environment and mandate, they would be encouraged to pick these prototypes

from NCAM and mass-produce them for use by our farmers at more affordable prices.

Then the national extension system can be empowered to sensitize, promote and deploy these simple labour saving devices across the nation. With this, we will gradually begin to reduce the percentage of rudimentary tools used in agriculture. If this is done with all sincerity and the needed political will, Nigeria will sooner than later become like one of the fast-developing Asian countries. This was how India and China began to produce appropriate and affordable labour-saving devices for their populations and ecologies to improve their agricultural outputs. Today, despite their vast populations, they are able to feed themselves and have surpluses for export. I believe that Nigeria, being the giant of Africa with population of about 200 million, can sufficiently feed her citizens. No nation can move forward in any meaningful development without fixing its agriculture because a man is as good as what he eats.

Therefore, going forward, let us begin to pay less attention to the import of heavy agricultural machinery. Let us take advantage of NCAM and our automobile industry to build machines that work for us. We must also strengthen our extension system to popularise the technologies among farmers and local fabricators. This is in my idea and thinking of mechanising agriculture in Nigeria. A reduction in drudgery or labour-intensity of agricultural labour through mechanisation would definitely lead to making agriculture an attractive business for all, youths inclusive. These labour- saving devices can be introduced across the agricultural value chain—from land tillage through cultivation, planting, harvesting, to processing, branding, packaging and to the consumers' table.

List of Agricultural Research Institutes with their Mandates

	Commodity/Research Area	Institutes/Centres
1	Arable and Horticulture crops	IAR, IAR&T, LCRI, NCRI, NIHORT, NRCRI
2	Forestry and Tree crops	CRIN, FRIN, NIFOR, PRIN
3	Livestock/Animal Health	IAR&T*, NAPRI, NITR, NVRI
4	Fisheries and Marine Resources	NIFFR, NIOMR
5	Post- Harvest Storage And Processing	FIIRO**, NSPRI,PRODA**
6	Agricultural Mechanization	NCAM
7	Extension & Training	NAERLS, ARMTI
8	Social Science & policy	NISER**
*IAR&T is involved in both crops and livestock research		
**Institutions not coordinated by the ARC		

Mitigating post-harvest losses

The desire for mechanisation also demands that we have the mind-set to reduce postharvest losses. It is on record that over 50% of what we produce in agriculture is wasted between harvest and the table due to damages during processing, decay from ineffective preservation, and insect attacks during storage. Our system has not fully embraced the concept of value chain agricultural development—with the upstream subsector including all areas in production, and the downstream involving activities in postharvest, processing, packaging and marketing. Over 50% of vegetables produced in Nigeria are often lost between the farm and table. In the livestock subsector, animal products, such as meat, eggs and milk, often lose more than 50% of their quality due to certain microbial activities as a result of poor preservation system. We must therefore develop effective cold room systems and technologies to help preserve milk, meat and fish. This cannot happen, of course, without the continuous supply of electricity.

Mechanisation and industrialisation cannot thrive in an environment of poor power supply. For years, Nigeria has not been able to get it right with regard to electricity generation, transmission and distribution. With our population of over 200 million and economic activities, the country should not be producing less than 50 megawatts of electricity; but we are only able to produce an average of between 2 and 5 megawatts for the last 30 years.

It is as if the generation, transmission and distribution of electricity are rocket science projects but there are not. The fact is, if we must get it right in agricultural mechanisation, developing along the value chain, there must be constant supply of power—particularly to reduce postharvest losses in vegetables, livestock and aquaculture products.

Nigeria is in the tropics, with about 10 hours of sunlight on a daily basis. Many nations, especially in the western hemisphere, do not have that privilege. So why won't we take advantage of being in the tropic and go solar; it doesn't have to be gas or hydro all the time, because these have failed us in the last 40 years. China generates about 40% of its total energy requirement from the sun; and china is not in the tropics. So I want to suggest that we encourage private companies, through the provision of a favourable policy environment, to invest in solar devices for electricity generation and utilization.

For any nation, matters of agriculture are matters of life because it is basically about food the first basic critical need of man. I cannot see Nigeria coming out of poverty, insecurity and insurgency without us taking seriously the issue of agriculture. A hungry man they say is an angry man. He is angry because he cannot think straight; no hungry man can reason properly. Moreover, food has no political boundary, has no respect for any region or ethnicity, and has no regard for age or education. Food is a common denominator that must be fixed if we must develop. No nation has ever developed without first fixing its agriculture.

Finally, we need to realise that no success in life happens by accident; it is always by intentional and deliberate actionable planning. Agriculture worked in Nigeria before, why will it not work in the now? Was it not agriculture that gave Nigeria the title 'Giant of Africa'? We discovered oil in the 1960s and thereafter got derailed because of the 'free money' that came into our hands. I think it is now the right time for us to revamp our agriculture, especially as the oil economy is dwindling globally. One lesson we need to learn in this season is that our petroleum-driven economy could be in grave danger. Since agriculture worked for us in the days of Sir Ahmadu Bello, Chief Obafemi Awolowo and Dr Nnamdi Azikiwe, let us return to it. For us to make it work in this age, however, we must

modernise the practice through mechanisation. In addition, there has to be increased investment in technology to facilitate and engage our youths into embracing modern agriculture.

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