MECHANIZATION IN NIGERIA:
YESTERDAY, TODAY AND THE FUTURE

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1.0 INTRODUCTION

- Mechanization simply is the process of changing from working largely or exclusively by hand or with animals to doing that work with machinery.

- Agricultural mechanization is broadly defined to include: the manufacture, the distribution, the operation, the maintenance (on farm and off-farm) of all types of tools, implements, machinery, and equipment for agricultural production (i.e. land clearing, land levelling, tillage activities, planting and crop management etc.), harvesting, crop processing and Irrigation activities.
The agricultural mechanization devices may be powered by human energy (hand-tool technology) draught animals (animal traction power) and mechanical devices (internal combustion engines) or a combination of two or all three.

Agriculture is undertaken in most states of Nigeria by hand-tools technology in about 70-90% of the cultivated land by draught animal power in 10-25%, and mechanical power 5-15% of the cultivated land. This compares unfavourably with countries of Asia (Japan, China, India, South Korea, Malaysia, and Indonesia) Latin America (Brazil, Argentina, Cuba, and Chile) and Europe.
Government past effort to achieve food sufficiency has been met with little success.

Agricultural labour remains scarce, resulting in loss of cropping opportunities.

Farmers cannot find labour for land clearing, land preparation, planting, weeding and harvesting.
1.1 PAST GOVERNMENT EFFORTS TO PROMOTE AND POSSIBLY PRIVATISE MECHANIZED FARMING.

- Thousands of tractors and implements were procured and sold at subsidized prices.
- State and local Governments also established tractors-hiring units which have not been profit oriented and most of them have folded up as of today.
There is however a success story in the population of draught animal power in states like, Kebbi, Sokoto, Zamfara, Kano, Kaduna, Bauchi, Yobe, Gombe, Bornu and some areas of Niger state. This technology has gone a long way towards increasing productivity and reducing drudgery of small and medium scale farmers. But it will take a long while for farmers who have no livestock keeping tradition to adopt.
1.2 PRESENT ATTEMPTS TO PROMOTE MECHANIZATION

- Nigeria estimated tractor population is about 30,000 tractors.
- About 50% are functional
- Showing low mechanization rates of 0.021 hp/ha as against the 1.5hp/ha recommended by FAO.
- Considering, 70million hectares of arable land in Nigeria demanding mechanization activities: Nigeria needs not less than one million tractors with implements.
Present unit of functional tractors is too low and cannot meet the need of the farmers as to make Nigeria self-sufficient in food and material productions.

Private vendors and service providers are being encouraged by the present Federal Government to take over the tractor Hiring/Leasing programme and this will create great potential for mechanization market.
2.0 WHY NEED FOR MECHANIZATION

Mechanization is needed to reduce or eliminate drudgery, make farming creative, reduce rural-urban migration, increase timeliness of performing field operations (planting, weeding and harvesting), increase cropping intensity, increase the productivity of labour and expand the area under cultivation. All the above reasons are aimed at producing more food and raw materials to feed the ever increasing population.

Agricultural mechanization inputs tend to be quite expensive in comparison to the biochemical inputs (improved seeds, fertilizers and pesticides). This has made it difficult for farmers to acquire machinery inputs.
2.1 CHALLENGES AFFECTING MECHANIZATION (TRACTOR OPERATION)

- Lack of continuity of government policy: The various policies of government have not encouraged mechanization.
- Subsidies rendered to farmers are more political than technical in nature, for example about 3 to 4 years ago, State Government gave a subsidy of tractors to tractor Owners/Operation Association of Nigeria (TOOAN, Oyo State). Giving A set of equipment (i.e. tractor, plough and trailer). It shows that the state government never understand how mechanization works.
Farmers in Oyo State today, double plough their land. Then going ahead to plant, weed and harvest the crops manually. Harrow implement is difficult to find in Oyo State.

Despite the many advantages of increasing agricultural mechanization in Nigeria. It is the most controversial and least understood input. This result to the graveyards of agricultural machinery and implements as it was rampant in the 80’s and 90’s.
If agricultural mechanization is to succeed in Nigeria, it is important for all the key players (policy makers, planners, donors, engineers, marketers, agriculturists, technicians and the farmers) to understand the role, and level to which Nigeria agriculture can be mechanized with the consequences of mechanization: - technically, environmentally, Socio-economically etc. This has to be understood in the context of the entire farming system.

Need for honest formulation and implementation of agricultural mechanization. Policies and implementation strategies, enough of empty talking but more of actions.
» Insufficient technical knowledge of importers and in-correct selection and matching of tractors with implements.

» Importation of technically faulty tractors and implements. Nigeria is becoming dumping ground for surplus agricultural equipment product from China and India

» Poor land clearing method

» Use of untrained personnel (i.e. Taxi drivers) to operate tractors.
Poor maintenance culture by not following the maintenance schedule chart.

Operating equipment under difficult terrains thereby threaten life and equipment.

Dishonest practices

Overworking tractors

Lack of incentives for the operators

Lack of sufficient sales service centres by private vendors
Lack of knowledgeable mechanics in the rural areas.

Lack of spare parts to carry out maintenance and repair of broken down tractors.

Agricultural machinery is not kept under shed to prevent rust.

Use of wrong professionals to extend and supervise mechanization machinery operation, thereby causing misunderstanding in communication.
Poor record keeping on machineries

Observed that owners of machineries are more interested in procurement but fail to train the operators of their tractors.

Trainings conducted by tractor vendors are technically and agronomically deficient. Training needs are not well defined and up-to-date.

Many private tractor owners believe that government alone must sponsor trainings for them.
This result in labour force which lack the skills to use mechanization equipment.

Bilateral aid agencies in particular have mostly failed to design their loan for mechanization to take advantage of local fabrication.

There is deceit on the issue of technology transfer from developed nations to Nigeria. No nation is ready to transfer technology. How can they show us the sources of their business?
3.0 ACTION TO BE TAKEN TO OVERCOME CHALLENGES
3.1 CHALLENGES FACED BY LOCAL MANUFACTURES/FABRICATORS

- Nigeria should take all the necessary steps to encourage local manufacture, repair and servicing of agricultural machinery and implements.
- Government should assist local fabricators and manufacturers.
- Imposition of tariffs on imported machinery and implements.
- Controlling importation to strengthen local production of machinery and implements which can be manufactured locally.
Provision of financial assistance to local fabricators such as bank guarantees for concessional loans.

Improve capacity of local fabricators enterprises on research and training of staff for them.

Supply of prototypes and blue prints by government institutions to local fabricators/manufacturers for multiplication.

Sales promotion
Importation of raw materials at duty and excise free to bring down cost.

Standardise our fleet of tractors and implements to a few makes and types.

Need to increase well focus research and development efforts on agricultural mechanization in universities.

In the development of machinery there is needed to advance further from prototype to commercial manufactured machinery.
3.2 CHALLENGES FACED BY OTHER STAKEHOLDERS

- There is need to strengthen institutions and engineering enterprises which offer training to agricultural mechanization professionals and technicians.
- It is necessary to undertake research on a long term basis on tillage methods used.
- Sensitize farmers, operators of tractors, on the likely environmental consequences of inappropriate tillage and land clearing methods.
Bilateral aid agencies should be convinced to design their loan or grant for Nigeria towards our needs to help us develop our own technology instead of bringing to us foreign technology that breakdown fast and no part or fund to or knowledge to repair them.

Any imported equipment must come with appropriate English manual.
On the issue of technology transfer we need to learn some lessons from China. We need to develop our own home breed technology. No nation will transfer technology to us. Stop being lazy. We must be ready to steal it by force. Build it for home consumption and not export and solve our problems.

The Nigeria Government must create an enabling environment to encourage and drive technology development revolution in the country. The farmers should also start to look inward.
4.0 SUGGESTED SOLUTIONS TO THE CHALLENGES

- Avoid use of untrained personnel to operate tractors. It takes time to train a good operator.
- Ensure that agricultural machineries are stored under shed to avoid rust.
- Need for continuous training and retraining of operators, mechanics and supervisors to develop well skill operators.
- Enforce that tractor vendors are mandated to establish after sales centres.
Ensures continuous supply of spare parts of different models and make of tractors common in the country at affordable cost.

Ensure proper land clearing operation to extend tractor life span. Avoid using tractor in bad terrain.

Ensure discipline by operators, mechanics and supervisors.

Introduce incentives to operators to reduce corrupt practices.
Urgent need to hold a national stakeholder workshop to discuss on the way forward.

Need for competent and well trained personnel to handle and supervise operators and mechanics.

Need to conduct management training for the supervisors of tractor operation and maintenance.
Ensure proper record keeping operations as well as the amount generated and spent on equipment to determine its viability.

Ensure that various tractor models marketed in Nigeria are first tested by National Centre for Agricultural Mechanization, Ilorin.

Need for government and private sectors to establish more mechanization extension institutions closer to tractor operators and farmers.
Need for continuity of mechanization programme with little modification when necessary.

Important for tertiary institutions to be involve in training of engineers, technical officers and technicians to devote more efforts on practical trainings on mechanization.

The Federal government needs to sponsor the survey of existing numbers of functional tractors and other machinery in Nigeria and continue to upgrade the data every five year.
4.1 SUGGESTION ON PROCUREMENT OF EQUIPMENT BY USERS

- Before choosing and buying equipment some thought should be given to it;
- The possibilities of adapting existing equipment;
- Size of area to be sown in a single holding and the possibilities of hiring out the equipment to neighbouring farmers;
- The power source available;
The typical condition of seed beds and the level of sophistication required,

Ease with which seed metering and seed size alteration can be made.

Skill level of the operators

Ease of maintenance and availability of spare parts
5.0 CONCLUSION

- Mechanization of crop production should be selective with due consideration to potential area and appropriateness of the technology.
- The Nigerian government and private sectors need to give continuous support to research and extension of mechanization equipment so that the nation can thoroughly be self-sufficient in food and raw material production and processing.
Mechanization should no more be a lip service programme by the various level of governments. Stop preferring equipment imported from China and India at the detriment of home technology development.

India was a food deficient country about three decades ago but now had surplus food partly due to successful agricultural mechanization policy.
We must realise that among the economic challenges lies the nation greatest opportunity to diversify and be self-reliant and self-sufficient in food production.

This can be done by strengthening the capacity of our entrepreneurs to produce machinery using local content and while consumers decide to always buy made in Nigeria products. (Senate President, Bukola Saraki).
THANKS FOR LISTENING