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Involvement of small scale farmers in policy formulation prerequisite for adoption of modern technology in agricultural production in Nigeria

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Abstract
Traditional farming system in Nigeria is markedly subsistence oriented with the attendant poor yield. Efforts by governments to introduce mechanical means by massively importing agricultural machineries and distributing to farmers for mechanization of agricultural practices, have consistently failed because the small farmers who are to use these motorized equipment lack the capacity to sustain and use them. Experiences have shown that only locally manufactured agricultural machineries that can be locally repaired and maintained are more readily adopted by the small scale farmers. Thus, for agricultural mechanization to succeed in Nigeria, the mechanical means required for agricultural operations need to be developed, manufactured in the country. Farmers should also be involved in formulating policies or taking decisions on the affairs that affect them.

Keywords: small scale farmers, agricultural mechanization, policy formulation

Introduction

Right from independence in 1960, the Federal Government of Nigeria have put forward various policies and programmes to attain a middle income status with a good income per capita through mechanized agricultural practices in full realization that agriculture holds the key to development of the economic and political life of the country, contributing over 60% of the country's Gross Domestic Product (GDP), and employing over 70% of the country's economically active population (Ogbulafor 2003) [8]. The country therefore could not afford to toy with agricultural sector of the economy.

The Federal Government envisioned that an accelerated agricultural growth would ensure food security, supply the needed raw materials to the industries, offer employment to the citizens, as well as poverty reduction, and provide surplus for export. But farming system in Nigeria is heavily infested with peasant farmers who are poverty stricken to keep pace with the aspirations of the country. Poverty according to UNECA (2005) [12] is a condition of lacking money and the necessities, such as food, water, education, health care, shelter and clothing, which are needed to successfully live. The level of poverty is measured in terms of daily incomes of US$ 1.25 and US$ 2.00. The level of poverty in developing countries has made the United Nations Organization to adopt the Millennium Development Goals (MDG) aimed at renewing global commitment of member states to reduce poverty and the worst form of human deprivation. UNDP (2008) [13] stated that poverty rates in Sub-Saharan Africa remain as high as 51%.

Despite the fact that over 70% of the active populations in the country are engaged in agricultural production, the level of production is often insufficient to meet the nation's needs (Adama and Onwualu, 2010, Umeghalu, *et al*., 2012) [1, 11].

According to Jonnson and Sindazi (1986) [4], the small scale farmers are not more productive because of the following reasons operating on crop production at their level:

1. Problems encountered in adopting new farming technology namely:
   i) Lack of improved varieties.
   ii) Poor adoption of fertilizers and other essential farm inputs due to high costs.
   iii) Lack of small implements with low costs.
   iv) Inadequate crop protection from weeds, pest and diseases.
2. Problems of organizational and basic development.
   i) Poor developed extension/research linkage.
   ii) Inadequate transport infrastructure in rural areas where agriculture is practiced.
   iii) Lack of properly structured extension activities.
   iv) Poorly developed markets.
   v) Poor processing facilities.
3. Problem of policy.
   i) Defective land tenure policy.
   ii) Inconsistency of government policy.
   iii) Lack of incentives.
   iv) Lack of credit facilities to small scale farmers.

Mechanization of agricultural practices

Agricultural mechanization is the development, introduction and use of mechanized assistance of all forms and at any level of technological sophistication in agricultural production (Onwualu *et al*., 2006). Tractorization which simply means the use of tractors for farm work is always mistaken to mean agricultural mechanization. Agricultural mechanization involves the design, development, operation and maintenance of prime movers and devices for agricultural land development, crop and animal production, processing and storage (Asoegwu and Asoegwu, 2007 [3]; Odigbo, 2016; Onwualu *et al*., 2006). Odigboh, (2016)

however posited that for agricultural mechanization to succeed, all the needed agricultural machines and equipments should, as far as possible be manufactured locally, to ensure their acceptability, adoptability, affordability, reliability, availability, durability, maintainability, manageability, reproducibility, and sustainability. He further advised that importation of machines and equipment not manufactured in the country should only be based on professional advice by experts in the field.

True to this, to increase agricultural production, the Federal Government of Nigeria and some state governments embarked on massive importation of tractors and equipment, and distributed a good number of them to small scale farmers and the rest used to set up Tractor and Equipment Hiring Schemes (Adama and Onwualu, 2010) [1]. But with very few exceptions they failed. This is because, only the commercial farmers have the capacity for good repair and maintenance facilities while the small scale farmers facing serious challenges. Also the tractor hire schemes converted small scale farmers to completely be dependent on an outwards service instead of actively participating and thus they developed laziness and idly waiting for their turn for hired tractor which often never came through.

One of the major reasons why mechanization of agricultural practices failed in Nigeria was that small scale farmers were not taken into consideration during the planning stages of the policies and progarammes to mechanize agricultural production processes in the country. The result is that, identified problems and solutions are not attractive to farmers whose overriding concerns are elsewhere in the system (Jonnson and Sindazi, 1986; Kienzle *et al*., 2013) [4, 5]. Thus the approach of pull down technology diagnosed as appropriate to local farm situation, a major difference from current top down pushing of technologies at farmers, regardless of the specifics of their local situation will in no way offer good result of sustainable agricultural mechanization. Extension workers therefore should rather do well to have a great deal of confidence in recommendations developed in the participatory way on local farms.

Relationship between key players in agricultural mechanization.

Though it is correct to assert that policies and programmes of the Federal Government to mechanize agricultural practices are commendable, it is rather worth pointing out that consideration was not given to farmers who are at the receiving end. Thus, for agricultural mechanization to succeed, mechanization process has to be broken into sectional units (Jonsson and Sindazi, 1986) [4]. These sectional units are as follows:

1. Mechanization with emphasis on animal power for small scale farmers.
2. Rural structure- both human and animal buildings at rural level and village level water supply.
3. Storage and processing of agricultural products.
4. Village workshop- carpentry, blacksmithing, masonry.

Village workshop is very important component of all the other units where manufacturing, repairs, fabrication and maintenance of all kinds of equipment/devices which are used in all other units, particularly village level are carried out (Umeghalu, 1983) [10]. Mechanization system through mechanical means require that agricultural operation needs must be developed, manufactured, distributed to farmers, serviced, repaired and exploited by traditional farmers. For instance, the local tools adopted by subsistence farmers such as hoes, matchets are made locally, repaired and maintained through local technology. In designing the local tools, variations both in shape, sizes etc which are location specific are taken into consideration. Likewise it is apt that before national model or objective for agricultural mechanization are formulated, it is vital to gather all relevant farming statistics. In Nigeria. Some statistics regarding the following existing agricultural operations before mechanizing them are shown in Table 1.

Table 1: Some vital statistics to enhance sustainable mechanization policy formation.

Crop Production	Livestock Production	Storage and Processing	Service Function	Marketing
Land clearing	Land clearing	Drying	Management	Transport
Seed bed preparation	Pasture development.	Shelling	Infrastructure development	Storage
Irrigation	Feeding	Cleaning	Maintenance	Selling
Planting	Watering	Grading	Water distribution	etc
Fertilizer application	Manure disposal	Oil extraction	Transport	
Chemical application	Spaying	Storage	Etc	
Pruning	Treatment	Chemical application		
Weeding	Sorting	Cooking		
Harvesting	Milking	Fermentation		
Threshing	Egg collection shearing transport	Fire wood		
Bailing	etc.	Transport		
Transport		etc		
etc.				

Conclusions and Suggestions

It is evident from the forgoing that the small scale farming system is vital for agricultural production in Nigeria. Also very important is the use of mechanical means to increase agricultural products as more land will be put under cultivation.

However, the need to manufacture these agricultural machineries locally cannot be overemphasized to be easily accepted by local farmers who needed them. It is equally important that linkage should exist between all the key stakeholders in agricultural sector.

References

1. Adama JC, Onwualu AP. Agricultural Mechanization

as a Strategy for Sustainable Food Security in Nigeria. Proceedings of the 10th International Conference of the NIAE, 2010, 31. Enugu.
2. Anazodo UGA. Farm Power and Machinery Management. Invited paper at a National Workshop on cost effective and management of Agricultural Mechanization Infrastructure, organized by agricultural and Rural Management Training Institute. (ARMTI) and NACB. Federal Training Centre, Enugu, 1983, 1988.
3. Asoegwu SN, Asoegwu AO. An overview of Agricultural Mechanization and its Management in Nigeria. Agricultural Engineering International: The CIGR E-Journal, Invited Oven. 2007; 6:ix.
4. Jonsson LO, Sindazi M. Small Farm Mechanization. Invited paper delivered at the Conference on Improved Food Production by Small Farms in Africa organized by Food and Agricultural Organization of United Nations, Rome, 1986.
5. Kienzle J, Ashburner JE, Sims BG. (ed) Mechanization for rural development: A review of patterns and progress from around the world. Integrated Crop Management. 2013; 20:xxiii-xxvii.
6. Sims BG, Kienzle J. Farm Power and Mechanization for Small Farms in Sub-Saharan Africa. Agricultural and Food Engineering Technical Report, FAO Rome, 2006.
7. Odigboh EU. Global Food Crisis: Intensified Agricultural Mechanization Imperative For Nigeria. Lead Paper Presented at The First South-East Regional Conferences of The NIAE held at Nnamdi Azikiwe University Awka, 2008, 12-19.
8. Ogbulafor VE. Obasanjo's Economic Direction 1999-2003. Economic matters. The Presidency Shehu Shagari Way, Abuja, 2003.
9. Okigbo BN. Increased Food Production Through Low-Cost Food Crop Technology at IITA, 1987.
10. Umeghalu ICE. Optimal distribution of repair and maintenance fund for mechanization of agriculture in Anambra State of Nigeria. MSc Thesis submitted to the Department of Agricultural Engineering, Technical University, "Angel Kanchev" Rousse Bulgaria, 1983.
11. Umeghalu ICE, Okonkwo JC, Nwuba EIU. Modern Technologies and Nigerian small scale farmers: Constraints and prospects of its adoption. Scientific Journal of Agricuture. 2012; 1(4):68-73.
12. United Nation Economic Commission for Africa (UNCA) Poverty Profile: Methological note on Measuring Poverty, Economic and Social Policy Division, Addis Ababa, Ethiopia, 2005.
13. United Nation development Programme Human Development report 2007/2008. Fighting Climate Change. Human Solidarity in a Divided World. New York, 2008.