RURAL FARMERS PERCEPTION ON THE USE OF AGRICULTURAL MECHANIZATION IN AGRICULTURAL PRODUCTION IN RIVERS STATE, NIGERIA

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ABSTRACT

The study examined rural farmers' perception on the use of Agricultural Mechanization in agricultural production in Rivers State. The study employed a descriptive survey design to seek the opinions of the respondents. The population of the study consists of all rural farmers in the 23 local government areas in Rivers State. 102 rural farmers were randomly selected from 6 local government areas, giving the total sample size as 612 respondents. The data gathered was analyzed using mean and standard deviation with acceptance mean value of ≥3.00. The study revealed that agricultural mechanization can be used to carry out different farm operation in the farming process. It also revealed that there are lots of benefits in the use of agricultural mechanization in farming, this include; increase in productivity, reduction in time of operation, increase in income generation opportunities, increase in stable development of food system among others. The study also revealed that Scarcity of machinery, Shortage of spare parts, Illiteracy of the farmers, Fragmentation, Lack of capital are some challenges bedeviling the use of agricultural mechanization in the rural areas. However, the study recommended that government should make Agricultural Mechanization available and accessible to farmers as to boost and motivate farmers in using them to maximize production; large area of land should be made available to willing farmers who want to go into large scale production.

Keywords: Agricultural Mechanization, rural farmers, agricultural production

INTRODUCTION

According to Nkakini, Ayotamunoa, Ogaji & Probert (2006) farmers in Rivers State employed only a low level of mechanization. Hilkiah & Okparanma (2004) also noted that some of the factors identified for the low level of agricultural mechanization in Rivers State include continued fragmentation of farmlands, poor capital based of individual farmers and weak commitment to implementation of mechanization programmes. The resulting low productivities were due to poverty, lack of knowledge of the implements, lack of incentive to use machinery in agricultural practices, and traditional tools being cheap and readily available to the rural farmer. Nigerian farmer have often been described as "The man with the hoe", (Odigboh, 2000). This is as a result of farmers' use of crude implements for farming despite the huge revolution that the agricultural industry have undergone in the past decade as countries such as USA, Japan, Thailand, Switzerland, Canada among others have taken mechanization as a technique for improving productivity. Reid (2011) noted that farm mechanization is one factor that has a significant effect in agriculture since the beginning of modern agriculture. Agricultural mechanization according to Wikipedia (2013) is a process of using machinery to do agricultural work, which to great extent increases productivity. Folaranmi (2014) stated that agricultural mechanization is the process whereby equipments, implements and machineries are utilized by farmers to boost food and agricultural production in order to solve the problem of drudgery in production. Agricultural mechanization is

described as a major agricultural input which covers the application of mechanical technology and increased power to agriculture, which is a means of enhancing productivity of land and human labour (Republic of Kenya, 2015). It is the application of machines in the production process in agriculture ranging from land clearing, tilling, planting, harvesting among others, to maximize productivity, reduce time at work and meet up with food demand of the society.

Agricultural mechanization are of different types including the hand tools technology, manual work, animal drought technology, electrical power and renewable energy machine (Maharijan & Cheltri, 2006). These various powers are been used in different region depending on the choice of the farmer and the farm operation the farmer wants to carry out. The basic importance of the use of these implements is to maximize productivity thereby increasing the input to farming activities hence intensifying productivity in the agricultural sector and meeting the high demand of agricultural products. The technique is been employed by farmers at different stages of production. According to Rijk (2016) machines are used in ploughing of land, crop production, planting, stumping, ridging, fertilizer application, weeding, harvesting among others. Other area where mechanization is applicable includes land clearing, tilling operation, harrowing, transportation, processing and storage.

As a result of the adoption of agricultural mechanization, Mbanasor and Onwusiribe (2014) noted that the use of machines, greatly increase farm workers' productivity. Lamidi and Akande (2013) opined that there is reduction in drudgery, improved timeliness and effectiveness in various farm operations thereby bringing more land under cultivation, preserve the quality of production as well help in improving the living condition and notably improve the economic growth of the rural sector. Faborode (2001) and Lawal (2013) stressed that agricultural mechanization is beneficial in that it boost food production, increase information dissemination level, encourage youth participation, encourage multiple cropping, reduce drudgery, ensure food sufficiency, encourage foreign exchange revenue, improved processing and packaging, increase participation, increase economic return to farmers, improved timeless and precision of operation, improve working environment, improve farm worker dignity, increase steady supply of raw materials among others.

Despite these benefits recorded by researchers, Akande (2006) noted that Nigeria farmers have not really key in into this system or techniques as majority are subsistence farmers who cultivate about 1-2 hectares of land usually scattered over a wide range area. FAO (2009) noted that most farmers tend not to welcome the idea of the use of machine in farming which may be attributed to some challenges affecting them in farming including affordability, availability, and lack of maintenance and repair service. El-Hossary (1988) stressed that fragmentation of land with numerous canals, drainages and narrow access roads to farm poses a serious restriction to the use of mechanization. According to Rijk (2016), most farmers raised issues that mechanization has replaced labour thereby putting some farmers out of work, high capital is required for mechanized farming, agricultural mechanization is a male-dominated technology, farm areas are in fragment therefore cannot encourage the use of machine among others. Lamidi and Akande (2013) noted that land tenure system and access to capital have a major setback to the use of mechanization by farmers in Nigeria. Onyema (2010) and Odigboh (2000) reported that despite the heavy benefits in mechanization techniques, Nigeria farmers has access to only less than one percent of this conventional power, thereby attributing it to land tenure system, scarcity of machinery, illiteracy of the farmers, lack of maintenance technicians, inconsistent government policies, poor infrastructure, poverty and inaccessibility to credit, shortage of spare parts, prevailing agronomic practice, lack of trained machinery operators among others. In the study area the practice of land tenure system is a big obstacle in farming. Farmers cannot afford machinery with the high price and maintenance is also difficult because of lack

of technicians. Spare parts are not available because of poor patronage. Having viewed the various operational areas, importance and challenges facing agricultural mechanization in Nigeria, farmers in these areas seem not to be much involved in the use of mechanization as to resolve the use of crude implement in some rural areas in Rivers State. The questions now raised is if rural farmers know various farm operations that mechanization is applied, the benefits associated with the use of mechanization and the challenges on the use of mechanization in farming?

Purpose of the Study
The main purpose of the study is to ascertain rural farmers' perception on the use of agricultural mechanization in agricultural production in Rivers State. Specifically, the study seeks to:
1.   identify farming operation stages where agricultural mechanization are being used.
2.   determine the benefits on the use of agricultural mechanization by rural farmers
3.   ascertain the challenges bedeviling agricultural mechanization in the rural area.

METHODOLOGY
The study was carried out in Rivers State. The state is bounded on the South by the Atlantic Ocean, the North by Imo and Abia State, the East by Akwa-Ibom and the West by Bayelsa and Delta States. This region was chosen as there is substantial number of smallholder rural farmers who depend on agriculture as means of livelihood. The study adopted a descriptive survey design. The population of the study comprise of all the rural farmers in the 23 local government areas in Rivers State. About 102 rural farmers were randomly selected from 6 local government areas, giving the total sample size as 612 respondents. Data for the study were gathered using a structured questionnaire. Collected data were analyzed using mean and Standard Deviation with an acceptance mean value of ≥ 3.00.

RESULTS AND DISCUSSION

Table 1: Mean and standard deviation responses of rural farmers on the various farm operation stages where mechanization are used.

S/N	Variable	WM	SD	Decision
1.	Land clearing	3.09	0.59	Agreed
2.	Stumping operation	3.14	1.59	Agreed
3.	Tilling operation	3.05	0.99	Agreed
4.	Harrowing operation	4.00	0.66	Agreed
5.	Ridging	3.27	1.35	Agreed
6.	Planting activities	4.21	0.90	Agreed
7.	Weeding	3.00	1.42	Agreed
8.	Fertilizer application	3.20	0.72	Agreed
9.	Harvesting	4.20	0.91	Agreed
10.	Transportation	3.61	0.14	Agreed
11.	Processing	4.52	1.00	Agreed
12.	Storage	3.06	0.97	Agreed
	Grand Mean & SD	**3.53**	**0.94**	

Source: Field survey, 2016   WM = weighted mean, SD = Standard Deviation

Findings in table 1 revealed that respondents agreed that land clearing (3.09), stumping operation (3.14), tilling operation (3.05), harrowing operation (4.00), ridging (3.27), planting activities (4.21), weeding (3.00), fertilizer application (3.20), harvesting (4.20), transportation

(3.61), processing (4.52) & storage (3.06) respectively are various farm operation stages where agricultural mechanization can be used in the farming process. This study is complimented by Folaranmi (2014) & Rijk (2016) who noted that in this modern world of technology, there are machines which are used for various farm operations such as land clearing, planting and weeding, harvesting, processing, storage among others. These operations have different implements which are used to execute them at various levels which according to Rijk (2016) help in intensifying productivity in the agriculture sector and meeting the high demand of agricultural products.

Table 2: Mean and standard deviation responses of rural farmers on benefit of the uses of agricultural mechanization by farmers

S/N	Variable	WM	SD	Decision
1.	Ensuring high level of productivity	3.47	0.91	Agreed
2.	Ensuring food security	3.56	1.02	Agreed
3.	Reduce timeliness of operation	3.41	0.86	Agreed
4.	Ensuring steady supply of farm produce	3.16	0.65	Agreed
5.	Ensuring economic growth	4.41	1.96	Agreed
6.	Improving farmers livelihood	3.72	0.86	Agreed
7.	Eliminating drudgery	3.17	0.42	Agreed
8.	Reducing spoilage and wastage of farm produce	4.01	1.06	Agreed
9.	Increasing income generation opportunities	3.07	1.00	Agreed
10.	Increasing stable development of food system	3.50	1.04	Agreed
	Grand Mean & SD	**3.55**	**0.98**	

Source: Field survey, 2016   WM = weighted mean, SD = Standard Deviation

Table 2 revealed that respondents agreed that; Ensuring high level of productivity (3.47), Ensuring food security (3.56), Reduce timeliness of operation (3.41), Ensuring steady supply of farm produce (3.16), Ensuring economic growth (4.41), Improving farmers livelihood (3.72), Eliminating drudgery (3.17), Reducing spoilage and wastage of farm produce (4.01), Increasing income generating opportunities (3.07), Increasing stable development of food system (3.50) respectively were some of the benefits that farmers get as a result of the use of agricultural mechanization in the farming process. Faborode (2001), Lamdi & Akande (2013), Lawal (2013), Mbanasor & Onwusiribe (2014), stressed that agricultural mechanization is beneficial in that it boost increase in food production, reduces drudgery, improves timeless and precision operation, increases sustainable development of food system resulting in improve income, ensures increase in productivity among other numerous benefits. That means when farmers resolve to the use of agricultural mechanization in the agricultural sector, there will be massive production of goods that will meet the food demand of consumers in the market and even on the long storage and preservation of farm produce is ensured as there are sophisticated farm implement used for the preservation of food to avoid spoilage and wastage.

Table 3: Mean and standard deviation responses of rural farmers on the challenges bedeviling agricultural mechanization in the rural areas

S/N	Variable	WM	SD	Decision
1.	Land tenure system	3.55	0.29	Agreed
2.	Scarcity of machinery	4.21	1.60	Agreed
3.	Shortage of spare parts	3.71	0.98	Agreed
4.	Illiteracy of the farmers	3.00	0.20	Agreed
5.	Fragmentation	4.91	1.02	Agreed
6.	Lack of trained machinery operators	4.11	0.21	Agreed
7.	Prevailing agronomic practices	3.45	0.99	Agreed
8.	Lack of access road to the farm	4.32	0.44	Agreed
9.	Lack of maintenance and repairs	3.94	0.97	Agreed
10.	Lack of capital	3.69	1.32	Agreed
	Grand Mean & SD	**3.89**	**0.80**	

Source: Field survey, 2016   **WM = weighted mean, SD = Standard Deviation**

Table 3 revealed that respondents agreed that; Land tenure system (3.55), Scarcity of machinery (4.21), Shortage of spare parts (3.71), Illiteracy of the farmers (3.00), Fragmentation (4.91), Lack of trained machinery operators (4.11), Prevailing agronomic practices (3.45), Lack of access road to the farm (4.32), Lack of maintenance and repairs (3.94) & Lack of capital (3.89) respectively are some of the challenges bedeviling agricultural mechanization in the study area. This study is complimented by the studies of El-Hossary (1988), Odigboh (2000), FAO (2009), Onyema (2010), Lamidi & Akande (2013), Rijk (2016) among other scholars affirmed that, lack of maintenance and repairs, fragmentation, high capital requirement, land tenure system, scarcity of machinery, shortage of spare parts, illiteracy of the farmers among other factors are some of the challenges bedeviling agricultural mechanization in the study areas. Lamidi et al (2013) lamented that these factors have been accused as the major setback to development and use of this modern techniques in Nigeria.

CONCLUSION
Based on the findings of the study, it was concluded that agricultural mechanization can be used by farmers to perform different farm operations ranging from land clearing, stumping, tilling, planting, harvesting, and storage among other operations. It was also deduced that there are lots of benefits that accrued from the use of agricultural mechanization in farming process in that it ensures increased productivity, reduces time spent in the farm, preserve the quality of production, and reduces spoilage and wastage of farm produce and so on. Furthermore, the study also deduced that agricultural mechanization is not widely practiced in rural areas in Rivers State which is attributed to land tenure system, fragmentation of land, scarcity of implements, lack of capital to hire machines, lack of trained machinery operators among other factor are challenging areas that makes farmers in the study areas not to be using agricultural mechanization in their farming process.

RECOMMENDATIONS
Based on the findings of the study, the following recommendations were made:
1) The government should fine a palliative measure as to make agricultural machineries' available and affordable to rural farmers as this will enable them have easy access to farm machinery which will be used in carrying out their farm operations.
2) There should be a well organized workshop for farmers where they should be trained on how to operate different farm implements and at various farm operations which

implement to be used to carry out such operation. This will ease the stress as well reduce capital expenses on hiring farm machine operator. On the other hand, this will help to encourage rural farmers on adopting agricultural mechanization as a modern technique in boosting productivity.

3) Rural farmers should be given a free access to acquisition of land if they actually want to go into commercial farming in the sense that land tenure system should use of land should be reverse as this has discouraged many willing farmers from venturing into full time production due to lack of farmland space. When this is achieved, it will enable farmer employ the use of mechanization as crude implements can no longer work a large area of land.

4) The government should ensure that there is ready market where farm equipment spare parts will be purchase as this is one of the major challenges farmers face after purchasing farm implements. This will equally ensure proper machine maintenance and repair when the develop fault as a cause of operation.

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