

**RURAL FARMERS' PERCEPTION OF THE USE OF AGRICULTURAL MECHANIZATION
IN AGRICULTURAL PRODUCTION IN DELTA STATE NIGERIA.**

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Abstract

The study looked at rural farmers' perceptions of agricultural mechanization in agricultural productivity in Delta State. The respondents' opinions were gathered using a descriptive survey design. The study's participants were rural farmers in Delta State's 25 local government districts. 612 rural farmers were randomly chosen from 6 local government regions for a total sample size of 102. The data was evaluated using mean and standard deviation, with a 3.00 acceptance mean value. The numerous findings revealed the advantages of using agricultural mechanization in farming which includes increased productivity, reduced operating time, more income creation options, and more stable food system growth. The study also found that a lack of machinery, a shortage of replacement parts, farmer illiteracy, fragmentation, and a lack of money are obstacles to agricultural mechanization in rural areas. However, the study recommended that the government make agricultural mechanization available and accessible to farmers to encourage and motivate them to use it to maximize production; large areas of land should also be made available to willing farmers who want to engage in large-scale production.

Keywords: *Agricultural Mechanization, agricultural production , rural farmers,*

Introduction

Farmers in Delta State, according to Nkakini, et al., (2006), use only a limited amount of mechanization. Some of the factors indicated for the low degree of agricultural mechanization in Delta State, according to Hilkiyah and Okparanma (2004), include ongoing fragmentation of farmlands, poor capital bases of individual farmers, and weak commitment to the implementation of mechanization programs. Poverty, a lack of knowledge of the implements, a lack of incentive to adopt machines in agricultural techniques, and cheap and readily available traditional tools to the rural farmer contributed to low productivity. "The man with the hoe" describes Nigerian farmers (Odigboh, 2000). It is due to farmers' continued use of primitive farming implements, notwithstanding the massive upheaval. Agricultural mechanization is a key agricultural input that encompasses the application of mechanical technology and increased power to agriculture to increase land and human labour productivity (The Republic of Kenya, 2015). Mechanization uses machines in the agricultural production process, which includes land clearing, tilling, planting, and harvesting, among other things, to increase productivity, minimize work time, and meet society's food needs. Agricultural mechanization can be employed in the farming process at many phases of the farm operation. Hand tools technology, manual labour, animal drought technology, electrical power, and renewable energy machines are all examples of agricultural mechanization (Maharijan & Cheltri, 2006). These diverse powers have been applied in various regions depending on the farmer's preference and the farm operation that the farmer wants to do. According to Mbanasor and Onwusiribe (2014), the

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employment of machines considerably increases farm worker productivity due to agricultural mechanization. According to Lamidi and Akande (2013), there is a reduction in drudgery, better punctuality, and efficacy in various farm activities, consequently bringing more land under cultivation, preserving the quality of production, and substantially enhancing the rural sector's economic growth. Agricultural mechanization, according to Faborode (2001) and Lawal (2013), boosts food production, increases information dissemination, encourages youth participation, encourages multiple cropping, reduces drudgery, ensures food sufficiency, encourages foreign exchange revenue, improves processing and packaging, increases participation, increases the economic return to farmers, and improves time and precision of operation. El-Hossary (1988) emphasized that land fragmentation, which includes numerous canals, drainages, and narrow agricultural access roads, limits the utilization of mechanization. Most farmers raised concerns, according to Rijk (2016), that mechanization has replaced labour, putting some farmers out of work, that mechanized farming requires a lot of capital, that agricultural mechanization is a male-dominated technology, and that farm areas are fragmented, making it difficult to encourage the use of machines. According to Lamidi and Akande (2013), land tenure and access to capital are important hindrances to farmers' use of automation in Nigeria. According to Odigboh (2000) and Onyema (2010) despite the significant benefits of mechanization techniques, Nigerian farmers have access to only 1% of this conventional power, citing land tenure system, scarcity of machinery, farmer illiteracy, lack of maintenance technicians, inconsistent government policies, poor infrastructure, poverty and inaccessibility to credit, shortage of spare parts, prevailing agronomic practice, and lack of maintenance technicians as reasons. The practice of land tenure is a major impediment to farming in the studied area. Farmers cannot afford the high cost of machinery, and maintenance is difficult due to a shortage of professionals. Due to low demand, spare components are unavailable. After reviewing the many operational sectors, the necessity of agricultural mechanization, and the obstacles it faces, The question now is whether rural farmers are aware of the various farm operations where mechanization is used, the benefits associated with its use, and the challenges associated with its use in farming.

Purpose of the Study

The study's main goal is to find out how rural farmers in Delta State feel about agricultural mechanization in agricultural productivity. The study aims to:

1. Identify the stages of farming operations where agricultural mechanization is used.
2. Determine the advantages of rural farmers using agricultural mechanization.
3. Determine the obstacles to agricultural mechanization in rural areas.

Research Questions

Based on the above purpose, the study sought answers to these questions.

1. What are the stages of operations where automation is applied?
2. What are the benefits of agricultural mechanization to rural farmers?
3. What are the challenges bedevilling agricultural mechanization in the rural areas?

Methodology

The research was conducted in Delta State, located in the coastal Southern part of Nigeria. Edo and Ondo States border Delta State to the northwest, Imo and Anambra to the northeast, and Rivers State and Bayelsa State to the Southeast. This area was chosen because it has a large population of smallholder rural farmers who rely on agriculture. A descriptive survey design was used in the research. The study's population consists of all rural farmers in Delta State's 25 local government districts. 612 rural farmers were randomly chosen from 6 local government regions for a total sample size of 102. A systematic questionnaire was

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used to collect data for the study. With an accepted mean value of 3.00, the collected data were analyzed using mean and standard deviation.

Results and Discussion

Table 1: Mean and standard deviation analysis of response of rural farmers at the various stages of farm operation where automation is applied.

S/N	Variables	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	

Table 1 shows that respondents agreed that land clearing (3.09), stumping (3.14), tilling (3.05), harrowing (4.00), ridging (3.27), planting activities (4.21), weeding (3.00), fertilizer application (3.20), harvesting (4.20), and transportation (3.61), processing (4.52) & storage (3.06).

Folaranmi (2014) and Rijk (2016) complemented this study by pointing out that in today's technological world, machines are employed for a variety of farm tasks such as land clearance, planting and weeding, harvesting, processing, and storage, among others. These operations contain a variety of implements that are employed to carry them out at various levels, according to Rijk (2016), agricultural mechanization aid in increasing agricultural production and satisfying the increased demand for agricultural products.

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Table 2: Mean and standard deviation analysis of rural farmers’ responses on the benefits of agricultural mechanization.

S/N	Variables	WM	SD	Decision
1	Ensuring a 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 a 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	

Table 2 shows that respondents agreed on the following points: ensuring high productivity (3.47), ensuring food security (3.56), reducing timelines of operations (3.41), ensuring a 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), and increasing stable development of the food system (3.50) Agricultural mechanization, according to Faborode (2001), Lamdi & Akande (2013), Lawal (2013), Mbanasor & Onwusiribe (2014), boosts food production, reduces drudgery, improves timeless and precision operation, increases sustainable development of the food system resulting in improved income, and ensures an increase in productivity, among other numerous benefits. That is to say, if farmers decide to use agricultural mechanization in the agricultural sector, there will be massive production of goods to meet the market's food demand, and even long-term storage and preservation of farm produce will be assured because sophisticated farm implements are used to prevent spoilage and waste.

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Table 3: Mean and standard deviation analysis of response of 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	

Table 3 Land tenure system (3.55), scarcity of machinery (4.21), shortage of spare parts (3.71), illiteracy of farmers (3.00), fragmentation (4.91), lack of trained machinery operators (4.11), prevalent agronomic practices (3.45), lack of access road to the farm (4.32), lack of maintenance and repairs (3.94), and lack of capital (3.89) are some of the challenges confronting agricultural mechanization in the study area, according to respondents. Lack of maintenance and repairs, fragmentation, high capital requirements, the land tenure system, scarcity of machinery, shortage of spare parts, and illiteracy of the farmers, among other factors, are some of the challenges bedeviling agricultural mechanization in the study areas, according to El-Hossary (1988), Odigboh (2000), FAO (2009), Onyema (2010), Lamidi & Akande (2013), Rijk (2016), and other scholars. According to Lamidi et al. (2013), these problems have been cited as a key impediment to developing and applying modern techniques in Nigeria.

Conclusion

Based on the study's findings, farmers can employ agricultural mechanization to undertake various farm tasks such as land clearing, stumping, tilling, planting, harvesting, and storing, among others. It was also determined that there are numerous advantages to using agricultural mechanization in the farming process, including higher productivity, reduced time spent on the farm, preservation of product quality, and reduced spoilage and wastage of farm produce, among other things. Furthermore, the study found that agricultural mechanization is not widely used in rural areas in Delta State, which can be attributed to a variety of factors such as land tenure, fragmentation of land, scarcity of implements, lack of capital to hire machines, and a lack of trained machinery operators, among others.

Recommendations

Based on the findings of the study, the following recommendations were made:

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- 1) The government should devise a palliative solution to make agricultural machinery available and affordable to rural farmers, allowing them to have simple access to farm machinery employed in their farming operations.
- 2) Farmers should be instructed on using various agricultural implements and which implements to utilize for specific farm operations during a well-organized workshop. It will relieve stress while also lowering the cost of hiring a farm machine operator. On the other hand, it will encourage rural farmers to use agricultural mechanization as a modern strategy for increasing production.
- 3) Rural farmers should be granted unfettered access to land purchase if they desire to engage in commercial farming. The land tenure system should be reversed, as the lack of arable space has discouraged many willing farmers from moving into full-time production. When this is accomplished, farmers will be able to adopt mechanization because hand tools can no longer work a huge area of land.
- 4) One of the major challenges farmers face after purchasing farm implements is finding spare parts. The government should ensure a ready market for farm equipment spare parts, this will also ensure adequate machine maintenance and repair if a fault develops due to the operation.

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