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Impact of Mechanized Agricultural Cooperative Practices on Commercial Food Production in Nigeria: A Study of Nkanu West L.G.A of Enugu State

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ABSTRACT

The general aim of this research work is to examine "Impact of mechanized agricultural Cooperative practices on commercial food production in Nigeria (A study of Nkanu West L.G.A of Enugu State)". The specific objectives of this research work include the following: to examine the effect of mechanized agricultural Cooperative practices on commercial food production in Nkanu West Local Government Area, to ascertain the role of the government in promoting mechanized agricultural practices in Nigeria.For a successful completion of this research work, the researcher made use of both primary and secondary methods of data collection for information gathering. The data collected were presented in tables and analyzed with simple percentage while the hypotheses stated were tested with chi square. The findings made includes: the majority of the respondentsunderstand the concept of agricultural mechanization, the effects of mechanized agricultural practices on commercial food production in Nkanu West Local Government Area are that it boosts food production, agricultural mechanization had made the level of information dissemination to increase, Reduction in drudgeryand greater area under cultivation. In conclusion, The effects of mechanized agricultural practices on commercial food production in Nkanu West Local Government Area are that it boosts food production, agricultural mechanization had made the level of information dissemination to increase, Reduction in drudgeryand greater area under cultivation, The challenges militating against mechanized agricultural practices in Nkanu West Local Government Area are the prevalent tradition land tenure system, cost of mechanized cultivation, maintenance and repair costandunderutilization of tractors.The researcher therefore recommends that Agricultural scientists and engineers should make haste to transform Nigeria's agriculture through the development of technologies that are appropriate and acceptable to a majority of farmers, the sort of technologies that ensure, among other things, improved varieties and species of plants and animals, provision of appropriate types and quantities of agrochemicals, provision of adequate and sustainable sources of irrigation water, the speedy completion of farm operations, safe processing and storage of farm products, enhanced job satisfaction to the farmers, increasing their income base and ensuring their comfort which will generally preserve the human muscle power.

Keywords: Mechanization of agriculture, food production, Cooperatives

INTRODUCTION

Farm mechanization has been seen as the pivot to agricultural revolution in many parts of the world and has contributed greatly to increased output of food crops and other agricultural products to meet the demands of the ever increasing world population [1,2,3,4]. Mechanization of agriculture has solved food scarcity problems in many countries. Only about 3 percent of the American population is engaged in farming, and one American farmer produces enough food to feed thousands; a family can manage up to 1200 hectares of farmland [5,6].

The importance of agriculture in the Nigerian economy cannot be overemphasized. It is a major occupation providing employment for about 70 percent of the people [7,8]. Despite this, Nigeria is unable to produce enough food and fiber to meet her demand. This could be attributed among others, to the fact

that majority of Nigerian farmers are subsistence smallholder farmers who cultivate between 1-2 hectares, which is usually scattered over a wide area [7,8].

In the U. S, in 1900, 38% of Americans were farmers, 100 years later, there were 3% farmers that produces 47% of total world maize production for Americans and the world because of sophisticated mechanization [9,10]. This is in contrast to Nigeria where farmer is often described as the "hand–hoe farmer" because nearly all of his farm operations are still carried out manually using the inefficient hoe and cutlass. It has been reported by Muhammed, [11,12,13] that less than 2% of the agricultural production in Nigeria is mechanized in the real sense, leaving 98% of the production in the hands of traditional producers. The effect of this dependence on hand tool technology is low output and the technology cannot transform agriculture for increased commercial food production. A number of mechanization inputs for some processes like garri, cassava flour and melon oil have been developed by Research and Development Centers (R&DCs) in Nigeria but are laying "in-situ" [14]. They have not been extended to rural farmers.

The need for mechanization of Agriculture in Nigeria and West Africa has become more acute in recent years due to the urgent need to accelerate food and fibre production for the teeming urban and rural population. [16], summarized the primary objective of agricultural mechanization as: to minimize production cost, optimize protect quality, product the environment and minimize farm production flexibility.

In spite of huge amounts invested in the procurement of agricultural machine in Nigeria, the level of agricultural mechanization continues to be very low [17]. In respect of the above, Nigerian engineers have made a lot of progress in developing proto types of machines relevant to our crops soils and socio-economic conditions.

A major review of economic development in sub sharan Africa (SSA) by the World Bank reveals that from the last decade of the twentieth century upwards, an enormous task will be facing African agriculture. This includes, ensuring food security for a rapidly growing population, contributing substantially to foreign exchange earnings through the production of export crops and providing attractive and gainful employment for the rapidly growing number of unemployed youths [18].

[19], attributed the transformation in American Agriculture to mechanization. But it has been argued that for real progress, growth and sustainable advancement to occur in the agricultural industry anywhere, it is essential to apply in a balanced proportion what is called a trio of technologies comprising the biochemical, socio-economic and engineering (mechanization) technologies. However, it has been stated that the main reason for mechanization is economic e.g. mechanization in Asia, U.S.A and Europe is geared towards increasing or maintaining the farmer's net income. [20], observed that in Nigeria despite the rich land resources coupled with huge oil wealth and generally favourable weather, there has been a nineteen-fold increase in goods importation while [21] noted that the level of agricultural mechanization in Nigeria is still one of the lowest in the world. Ezedinma and [22, 23, 24, 25, 26] described it as even lower than that in some comparable African countries such as Kenya, Senegal and Ghana. It is therefore based on this premise that this project is been designed to study the effects of mechanized agricultural practices on commercial food production.

STATEMENT OF THE PROBLEM

There are many constraints to successful farm mechanization in Nkanu West Local Government Area and they include fragmentation of farmlands or small landholdings due to problems of land tenure system, poor capital base, scarcity of farm machinery and equipment, insufficient farm inputs, poor

infrastructural facilities, land degradation, poor social and economic structures. The constraints to mechanization as they apply to large scale farms in Nigeria as a whole are (1) access to credit, (2) non-setting up of manufacturing and repair services by entrepreneurs, (3) no improved infrastructure, (4) non-affordable and secure access to complementary inputs (fuel, electricity, and larger consolidated plots of land), (5) worst legal and regulatory capacity to protect the rights of owners of machinery, and (6) lower efficiency and capacity of public sector for implementing policy. The study will survey the effects that mechanization of Agriculture production will have on increase food production in Nigeria with special focus on Nkanu West.

OBJECTIVES OF THE STUDY

The broad objective of this study is to appraise the impact of mechanized agricultural cooperative practices on commercial food production focusing on Nkanu West Local Government Area of Enugu State.

The specific objectives include the following:

1. To examine the impact of mechanized agricultural practices on commercial food production in Nkanu West Local Government Area.
2. To ascertain the role of the government in promoting mechanized agricultural practices in Nigeria.
3. To identify the number of mechanized Agricultural farms in Nkanu West.
4. To identify the challenges militating against mechanized agricultural practices in Nkanu West Local Government Area.
5. To proffer solutions to these challenges.

RESEARCH QUESTIONS

The following questions are stated for this study;

1. What are the impacts of mechanized agricultural practices on commercial food production in Nkanu West Local Government Area?
2. What are the roles of the government in promoting mechanized agricultural practices in Nigeria?
3. How many mechanized farm are there in Nkanu West?
4. What are the challenges militating against mechanized agricultural practices in Nkanu West Local Government Area.
5. What are the solutions to these challenges?

RESEARCH HYPOTHESES

Hypothesis One

H_o: Mechanized agricultural practices do not have significant impact on commercial food production in Nkanu West Local Government Area.

H_I: Mechanized agricultural practices have significant impact on commercial food production in Nkanu West Local Government Area.

Hypothesis Two

H_o: The government does not play significant role in promoting mechanized agricultural practices in Nigeria.

H_I: The government plays significant role in promoting mechanized agricultural practices in Nigeria.

Hypothesis Three

H_o: There are no significant challenges militating against mechanized agricultural practices in Nkanu West Local Government Area.

H_I: There are significant challenges militating against mechanized agricultural practices in Nkanu West Local Government Area.

Hypothesis Four

H_o: The solutions to the above challenges are not significant.

H_I: The solutions to the above challenges are significant

SIGNIFICANCE OF THE STUDY

This study will be of enormous benefit to the farmers in Nkanu West Local Government Area as it will enlighten them on the need to adopt mechanized agricultural practices to increase commercial food production.

The recommendations from this study will suggest for better ways of addressing the challe nges of mechanized agricultural practices.

The general populace will understand the concept of mechanized agricultural practices.

Students and other researchers will widen their scope from the information contained in this study.

SCOPE AND LIMITATIONS OF THE STUDY

This study covers effect of mechanized agricultural practices on commercial food production in Nigeria focusing on Nkanu West Local Government Area.

This study will be limited by financial constraints, time limitations difficulty in gathering research materials

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RESEARCH DESIGN AND METHODOLOGY

RESEARCH DESIGN

The researcher used sample survey in this study. Sample survey is defined as a statistical observation in which only a selected part, not all elements, of the totality under study (called the universe in this case) are researched Orji, (2006).

AREA OF STUDY

Nkanu West is a Local Government Area of Enugu State, Nigeria. Its headquarters are in the town of Agbani. Another major town is Umuatugbu-oma in Akegbe Ugwu.

It has an area of 225 km² and a population of 146,695 at the 2006 census.

Nkanu people live within the Enugu East Senatorial zone of the present day Enugu State. They are predominantly farmers. The area lie approximately between latitude 60 30' North and longitude 70 30' East and stands on an estimated excavation of about 763 feet above sea level. According to sources from the defunct state ministry of works, land and transport, Nkanu West occupies an area of about 1602.22 square kilometers.

A colonial officer described the soil of the area as "fairly fertile with a light sandy soil made up of outcrop of laterite nature'. Indeed, the area is endowed with such mineral resources as bandile, salt, copper and notably coal.

Location

Nkanu West shares border in the East witj Ohaozara and Ivo local governments in Ebony state; on the West with Udi LGA, in the North with Nkalagu (Ebonyi) and Isi-Uzo LGA and in the South with Aninri and Awgu LGAs.

SOURCES OF DATA

The data used for this study was obtained through primary and secondary sources of data. Primary sources of data is the original way of gathering information. It is made up questionnaire. Secondary sources were obtained from journals, textbooks and internet

.

POPULATION OF THE STUDY

The population of study consist of the total population of the residents of Nkanu West Local Government Area, Enugu. The local government has a total population of 146,695 at the 2006 census.

DETERMINATION OF SAMPLE SIZE

In order to get a representation of the entire population, the Taro Yamani statistical formula was employed. According to Taro Yamene (1964) the formula is stated as follows:

$$n = \frac{N}{1+N(e)^2}$$

Where n = represents the sample size

N = represents the population

e = represents the margin of error

I = constant

For the purpose of this study, N will be equal to 146,695, e will be assumed to be 5%

Therefore the sample size for this research work will be

$$n = \frac{146,695}{1+146,695\ (0.05)^2}$$

$$= \frac{146,695}{1+\ 146,695\ (0.0025)}$$

$$= \frac{146,695}{1 + 366.74}$$

$$= \frac{146,695}{367.74}$$

$$n = 398.9$$

$$= 399$$

RESEARCH INSTRUMENT

The principal instrumentation used to gather information for this study were through questionnaire and interview questions administered on the respondents.

The questionnaire were distributed personally to various respondents thereby giving the researcher good opportunity of making first hand observation and independent judgment of the research project.

The types of statistical tools used in analyzing the questionnaire are based on simple distribution tables and percentages. The tests of hypothesis were done with the use of Chi-Square (X^2).

SAMPLING TECHNIQUES

In order to get a good representation of the population, the researcher used the stratified random sampling techniques. To make a sample a true representation of the parent population, we first divided the entire population into homogenous groups called strata. By applying the systematic sampling, we selected items from each stratum into the sampling. Using this method, we selected items out of a population of staff.

VALIDATION OF THE INSTRUMENT

To ensure validity of the research questionnaires the set of drafted questions was sent to the research supervisor, an expert in research supervision, who ensured that the questions were clearly appropriate and covered the research objective of the study.

After this a pilot study of two of the respondents was carried out. The combined effort led to modification of some questions, additions, and selection of some other leading to a set of questions that are clear, unambiguous with enough coverage of the research objectives.

RELIABILITY OF THE INSTRUMENT

Reliability is the degree to which an assessment tool produces stable and consistent results. This research project will adopt the test-retest reliability which is a measure of reliability obtained by administering the same test twice over a period of time to a group of individuals. The scores from Time 1 and Time 2 can then be correlated in order to evaluate the test for stability over time.

METHOD OF DATA ANALYSIS

In treating and analyzing of data collected extensive use of tabular and percentage will be paramount. The data collected will be presented in table and analyzed with percentage. The hypotheses will be analyzed by the use of Chi–Square formula.

The formula is shown below:

$X^2 = (O - E)^2 / E$

Where: X^2 = Chi – Square

O = Observed frequency

E = Expected frequency

DATA PRESENTATION AND ANALYSIS

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

The presentation of data collected means the way of arranging the different forms of data obtained through various data collecting techniques to enable the researcher perform analysis and exact new meaning from it. The data collected will be presented in simple table. The data analyses were based on the answer to the key questions received from the various departments. The key questions in the questionnaires will be analyzed by the use of simple percentage. A total of 399 copies of questionnaire were distributed to the respondents and 7 copies were lost while 392 copies were returned. Therefore, the analysis of this study is based on the returned copies of questionnaire.

Table 1: Questionnaire Distribution Table

Respondents	No. of quest. Distributed	No. of quest. Returned	No. of not quest. Returned	% of No. of quest. returned
Adult population	155	153	2	38
Young population	244	239	5	60
Total	399	392	7	98

Source: Field survey, 2019.

In table 1, a total of 155 copies of questionnaire were distributed to the adult population of Nkanu West Local Government, 153 copies were returned while 2 copies were lost representing a return rate of 38% while out of the 244 copies of questionnaire distributed to the young population, 392 copies were returned while 5 copies were lost representing a return rate of 60 but 145 copies were correctly filled and returned which represent 95% of the total questionnaire distributed while 8 copies of questionnaire were not returned representing 5%. 95% will represent a good percentage of respondents in this research work.

PRESENTATION OF DEMOGRAPHIC CHARACTERISTICS

TABLE 2:DISTRIBUTION OF RESPONDENTS BY GENDER

GENDER	NO. OF RESPONDENTS	PERCENTAGE
Male	201	**51**
Female	191	**49**
Total	**392**	**100**

SOURCE: Field Survey, 2019

The above table shows that 51% of the respondents are male while 49% of them are female. This implies that there are more male respondents than females. This implies that majority of the respondents are male.

TABLE 3:DISTRIBUTION OF RESPONDENTS BY MARITAL STATUS

MARITAL STATUS	NO. OF RESPONDENTS	PERCENTAGE
Single	119	**30**
Married	273	**70**
Total	**392**	**100**

SOURCE: Field Survey, 2019

The above table shows that 30% of the respondents are single while 70% of them are married. This shows that most of the respondents used in this study are married. This

shows that most of the respondents are married.

TABLE 4:DISTRIBUTION OF RESPONDENTS BY AGE

AGE	NO. OF RESPONDENTS	PERCENTAGE
20 – 30	62	16
31 – 40	102	26
41 – 50	109	28
51 and above	119	30
Total	392	100

SOURCE: Field Survey, 2019

The above table shows that 16% of the respondents are between the ages of 20 – 30, 26% of them are between the ages of 31 – 40, 28% of them are between the ages of 41 - 50 while 30% of them are from 51 years and above. This depicts that majority of the respondents are matured adults. The analysis shows that the respondents are adult.

ANALYSIS BASED ON KEY RESEARCH QUESTIONS

The analysis of data is based on the returned questionnaires from the respondents.

TABLE 4: Response on whether the respondents understand the concept of agricultural mechanization

OPTIONS	NUMBER OF RESPONDENTS	PERCENTAGE
Yes	250	64
No	142	36
Total	392	100

SOURCE: FIELD SURVEY, 2019

The above table shows that 64% of the respondents stated that they understand the concept of agricultural mechanization while 36% of them said no to this. Therefore, the majority of the respondentsunderstand the concept of agricultural mechanization.

TABLE 5: Impacts of mechanized agricultural practices on commercial food production in Nkanu West Local Government Area

OPTIONS	NUMBER OF RESPONDENTS	PERCENTAGE
Boosts food production	129	33
Agricultural mechanization had made the level of information dissemination to increase	98	25
Reduction in drudgery	90	23
Greater area under cultivation	75	19
Total	392	100

SOURCE: FIELD SURVEY, 2019

The above table shows that 33% of the respondents are of the view that one of the effects of mechanized agricultural practices on commercial food production in Nkanu West Local Government Area it boosts food production, 25% said agricultural

mechanization had made the level of information dissemination to increase, 23% said Reduction in drudgery while 19% said greater area under cultivation. Therefore, the effects of mechanized agricultural practices on commercial food production in Nkanu West Local Government Area are that it boosts food production, agricultural mechanization had made the level of information dissemination to increase, Reduction in drudgeryand greater area under cultivation.

TABLE 6: Roles of the government in promoting mechanized agricultural practices in Nigeria

OPTIONS	NUMBER OF RESPONDENTS	PERCENTAGE
Development in infrastructural facilities	142	**36**
Provision of micro credit to farmers	100	**26**
Legal and regulatory capacity to protect the rights of owners of machinery	80	**20**
The public sector should be efficient for implementing agricultural policies in Nigeria	70	**18**
Total	**392**	**100**

SOURCE: FIELD SURVEY, 2019

The above table shows that 36% of the respondents are of the view that one of the roles of the government in promoting mechanized agricultural practices in Nigeria is development in infrastructural facilities, 26% said provision of micro credit to farmers, 20% said legal and regulatory capacity to protect the rights of owners of machinery while 18% said that the public sector should be efficient for implementing agricultural policies in Nigeria. Therefore, the roles of the government in promoting mechanized agricultural practices in Nigeria are development in infrastructural facilities, provision of micro credit to farmers, legal and regulatory capacity to protect the rights of owners of machineryand the public sector should be efficient for implementing agricultural policies in Nigeria.

TABLE 7: The challenges militating against mechanized agricultural practices in Nkanu West Local Government Area

OPTIONS	NUMBER OF RESPONDENTS	PERCENTAGE
The prevalent tradition land tenure system	132	**33**
Cost of mechanized cultivation	100	**26**
Maintenance and repair cost	85	**22**
Underutilization of tractors	75	**19**
Total	**392**	**100**

SOURCE: FIELD SURVEY, 2019

The above table shows that 33% of the respondents are of the view that one of the challenges militating against mechanized agricultural practices in Nkanu West Local Government Area is the prevalent tradition land tenure system, 26% said cost of mechanized cultivation, 22% said maintenance and repair costwhile 19% said underutilization of tractors. Therefore, the challenges militating against mechanized agricultural practices in Nkanu West Local Government Area are the prevalent tradition land tenure system, cost of mechanized cultivation, maintenance and repair costandunderutilization of tractors

Table 8: The level of impact of mechanized agriculture

Options	NUMBER OF RESPONDENTS	PERCENTAGE
Strongly agree	129	33
Agree	98	25
Disagree	90	23
Strongly disagree	75	19
Total	***392***	***100***

SOURCE: FIELD SURVEY, 2019

Table 4.8 shows that 33% of the respondents are of the opinion that mechanized agriculture has strongly impact agricultural production, while 19% said disagree that mechanized agriculture have not impacted their production.

TABLE 9: Solutions to the challenges

OPTIONS	NUMBER OF RESPONDENTS	PERCENTAGE
Simple low-cost manufactured machines and equipment	194	**49**
Appropriate use of mills	118	**30**
Deliberate policy development and frame-work	27	**7**
Agricultural research institutes in Nigeria should be well equipped	53	**14**
Total	**392**	**100**

SOURCE: FIELD SURVEY, 2019.

The above table shows that 49% of the respondents are of the opinion that one of the solutions to these challenges is the use of simple low-cost manufactured machines and equipment, 30% said appropriate use of mills, 7% said deliberate policy development and frame-work while 14% said agricultural research institutes in Nigeria should be well equipped. Therefore, the solutions to these challenges are the use of simple low-cost manufactured machines and equipment, appropriate use of mills, deliberate policy development and frame-work while andagricultural research institutes in Nigeria should be well equipped.

TABLE 10: The need for agricultural mechanization

OPTIONS	NUMBER OF RESPONDENTS	PERCENTAGE
To minimize production cost	199	**51**
Optimize and protect quality	96	**24**
Minimize farm production flexibility	39	**10**
Ensuring optimum farm output	58	**15**
Total	**392**	**100**

SOURCE: FIELD SURVEY, 2019

The above table shows that 51% of the respondents are of the opinion that one of the objectives of agricultural mechanization is to minimize production cost, 24% said to optimize and protect quality, 10% said minimize farm production flexibility while 15% said ensuring optimum farm output. Therefore, the objectives of agricultural mechanization are to minimize production cost, to optimize and protect quality, minimize farm production flexibilityandensuring optimum farm output.

TEST OF HYPOTHESES

The hypotheses will be tested using the chi-square formula stated below:

$$X^2 = \frac{\Sigma (0 - E)^2}{E}$$

Where:

X^2 = calculated chi-square
0 = observed frequency
E = expected frequency
Σ = summation

The expected frequency (E) is calculated by adding all the observed frequency (0) and dividing by the number of observations.

Decision Rule: If the calculated chi-square value (X^2) is greater than or equal to the table value at 0.05 level of significance, the alternate hypothesis (H_1) is accepted, but if the calculated chi-square value is less than the table value, the null hypothesis (H_0) is accepted.

HYPOTHESIS ONE:

H_0: Mechanized agricultural practices do not have significant impact on commercial food production in Nkanu West Local Government Area.

H_1: Mechanized agricultural practices have significant effect on commercial food production in Nkanu West Local Government Area.

Data from TABLE 8 was used to test the hypothesis

Variables	O	E	O – E	$(O - E)^2$	$\frac{(0 - E)^2}{E}$
Strongly agree	129	98	31	961	9.81
Agree	98	98	0	0	0
Disagree	90	98	- 8	64	0.65
Strongly disagree	75	98	- 23	529	5.40
Total	***392***	***392***			***15.86***

The calculated chi-square value = 15.86

Df = (K – 1) (4 – 1) = 3

Table value at 0.05 of significance and 4 degree of freedom (Df) = 7.37778

Decision: Since the calculated chi-square (X^2) value (15.86) is greater than table value (7.3777), we reject the null hypothesis (Ho) and accept the alternate hypothesis (H_1) which states that mechanized agricultural practices have significant effect on commercial food production in Nkanu West Local Government Area.

HYPOTHESIS TWO:

H_0: The government does not play significant role in promoting mechanized agricultural practices in Nigeria.

H_1: The government plays significant role in promoting mechanized agricultural practices in Nigeria.

Data from TABLE 6 was used to test the hypothesis

Variables	O	E	0 – E	$(O - E)^2$	$\frac{(0 - E)^2}{E}$
Strongly agree	142	98	44	1936	19.76
Agree	100	98	2	4	0.04
Disagree	80	98	-18	324	3.31
Strongly disagree	70	98	- 28	784	8.0
Total	***392***	***392***			***31.11***

The calculated chi-square value = 31.11
Df = (K – 1) (4 – 1) = 3
Table value at 0.05 of significance and 4 degree of freedom (Df) = 7.37778
Decision: Since the calculated chi-square (X^2) value (31.11) is greater than table value (7.3777), we reject the null hypothesis (Ho) and accept the alternate hypothesis (H_1) which states that the government plays significant role in promoting mechanized agricultural practices in Nigeria.

HYPOTHESIS THREE:

H_o: There are no significant challenges militating against mechanized agricultural practices in Nkanu West Local Government Area.
H_I: There are significant challenges militating against mechanized agricultural practices in Nkanu West Local Government Area.
Data from TABLE 7 was used to test the hypothesis

Variables	O	E	0 – E	$(O - E)^2$	$\frac{(0 - E)^2}{E}$
Strongly agree	132	98	34	1156	11.80
Agree	100	98	2	4	0.04
Disagree	85	98	-13	324	1.72
Strongly disagree	75	98	- 23	529	5.40
Total	***392***	***392***			***18.96***

The calculated chi-square value = 18.96
Df = (K – 1) (4 – 1) = 3
Table value at 0.05 of significance and 4 degree of freedom (Df) = 7.37778
Decision: Since the calculated chi-square (X^2) value (18.96) is greater than table value (7.3777), we reject the null hypothesis (Ho) and accept the alternate hypothesis (H_1) which states that there are significant challenges militating against mechanized agricultural practices in Nkanu West Local Government Area.

HYPOTHESIS FOUR:

H_o: The solutions to the above challenges are not significant.
H_I: The solutions to the above challenges are not significant
Data from TABLE 9 was used to test the hypothesis

Variables	O	E	0 – E	$(O - E)^2$	$\frac{(0 - E)^2}{E}$
Strongly agree	194	98	96	9216	94.08
Agree	118	98	20	400	4.08
Disagree	27	98	-71	5041	51.44
Strongly disagree	53	98	- 45	2025	20.66
Total	***392***	***392***			***170.26***

The calculated chi-square value = 170.26
Df = (K – 1) (4 – 1) = 3
Table value at 0.05 of significance and 4 degree of freedom (Df) = 7.37778
Decision: Since the calculated chi-square (X^2) value (170.26) is greater than table value (7.3777), we reject the null hypothesis (Ho) and accept the alternate hypothesis (H_1) which states that there are the solutions to the above challenges are not significant.

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

The following findings are made for this study; The study discovered that 64% of the respondents stated that they understand the concept of agricultural mechanization while 36% of them said no to this. Therefore, the majority of the respondents understand the concept of agricultural mechanization. The researcher found that 33% of the respondents are of the view that one of the effects of mechanized agricultural practices on commercial food production in Nkanu West Local Government Area it boosts food production, 25% said agricultural mechanization had made the level of information dissemination to increase, 23% said Reduction in drudgery while 19% said greater area under cultivation. Therefore, the effects of mechanized agricultural practices on commercial food production in Nkanu West Local Government Area are that it boosts food production, agricultural mechanization had made the level of information dissemination to increase, Reduction in drudgeryand greater area under cultivation.

The study found out that 36% of the respondents are of the view that one of the roles of the government in promoting mechanized agricultural practices in Nigeria is development in infrastructural facilities, 26% said provision of micro credit to farmers, 20% said legal and regulatory capacity to protect the rights of owners of machinery while 18% said that the public sector should be efficient for implementing agricultural policies in Nigeria. Therefore, the roles of the government in promoting mechanized agricultural practices in Nigeria are development in infrastructural facilities, provision of micro credit to farmers, legal and regulatory capacity to protect the rights of owners of machineryand the public sector should be efficient for implementing agricultural policies in Nigeria.

The study discovered that 33% of the respondents are of the view that one of the challenges militating against mechanized agricultural practices in Nkanu West Local Government Area is the prevalent tradition land tenure system, 26% said cost of mechanized cultivation, 22% said maintenance and repair costwhile 19% said underutilization of tractors. Therefore, the challenges militating against mechanized agricultural practices in Nkanu West Local Government Area are the prevalent tradition land tenure system, cost of mechanized cultivation, maintenance and repair costandunderutilization of tractors.

The researcher discovered that 49% of the respondents are of the opinion that one of the solutions to these challenges is the use of simple low-cost manufactured machines and equipment, 30% said appropriate use of mills, 7% said deliberate policy development and frame-work while 14% said agricultural research institutes in Nigeria should be well equipped. Therefore, the solutions to these challenges are the use of simple low-cost manufactured machines and equipment, appropriate use of mills, deliberate policy development and frame-work while andagricultural research

institutes in Nigeria should be well equipped.

The researcher found out that 51% of the respondents are of the opinion that one of the objectives of agricultural mechanization is to minimize production cost, 24% said to optimize and protect quality, 10% said minimize farm production flexibility while 15% said ensuring optimum farm output. Therefore, the objectives of agricultural mechanization are to minimize production cost, to optimize and protect quality, minimize farm production flexibilityandensuring optimum farm output.

CONCLUSION

The majority of the respondents understand the concept of agricultural mechanization. The impacts of mechanized agricultural practices on commercial food production in Nkanu West Local Government Area are that it boosts food production, agricultural mechanization had made the level of information dissemination to increase, Reduction in drudgeryand greater area under cultivation.

The roles of the government in promoting mechanized agricultural practices in Nigeria are development in infrastructural facilities, provision of micro credit to farmers, legal and regulatory capacity to protect the rights of owners of machineryand the public sector should be efficient for implementing agricultural policies in Nigeria.

The challenges militating against mechanized agricultural practices in Nkanu West Local Government Area are the prevalent tradition land tenure system, cost of mechanized cultivation, maintenance and repair costandunderutilization of tractors. The solutions to these challenges are the use of simple low-cost manufactured machines and equipment, appropriate use of mills, deliberate policy development and frame-work while andagricultural research institutes in Nigeria should be well equipped.

The objectives of agricultural mechanization are to minimize production cost, to optimize and protect quality, minimize farm production flexibilityandensuring optimum farm output.

RECOMMENDATIONS

The following recommendations are made for this study:

1. Agricultural scientists and engineers should make haste to transform Nigeria's agriculture through the development of technologies that are appropriate and acceptable to a majority of farmers, the sort of technologies that ensure, among other things, improved varieties and species of plants and animals, provision of appropriate types and quantities of agrochemicals, provision of adequate and sustainable sources of irrigation water, the speedy completion of farm operations, safe processing and storage of farm products, enhanced job satisfaction to the farmers, increasing their income base and ensuring their comfort which will generally preserve the human muscle power.
2. Nigeria's agricultural engineers need to mechanize food production and processing to catch up with increasing population; empower the farmers with mechanization (improved inputs including IT) in order to produce the required results. Since the world is shifting emphasis from the traditional nut and bolt technology in agriculture to a wider spectrum through information technology, Nigerian agricultural engineers and

environmentalists should brace up and get involved in the new technologies for the best interest of the farmer and his environment.

3. To exploit the full potentials of the information and communications technologies, agricultural engineers and environmentalists must develop innovative applications and solutions for the farmer, and lead and guide developments in agro-bio-technological evolution. This is important because of the many demands on agriculture by the society.
4. Agricultural scientists and engineers and the government must find the mechanization technologies suitable and relevant to Nigeria's ecological zones, and fund their spread through granting credits to the farmers.
5. Designers of products, processes and machines should make them from local materials so that they may be readily available, adaptable, reliable and affordable as well as being manageable and environment-friendly. Without these approaches, it will be difficult, if not impossible, to solve Nigeria's food problems through agricultural mechanization and environmental management.

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