



## Level of Effectiveness of Public Tractor Hiring Services among Arable Crop Farmers in Oyo Agricultural Zone of Oyo State, Nigeria

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### Abstract

This study was conducted to examine the level of effectiveness of public tractor hiring system among arable crop farmers in Oyo Agricultural zone of Oyo State. A multistage sampling procedure was used to obtain a primary data from 145 respondents in the study area through a structured questionnaire and interview schedule. The data obtained were analyzed using descriptive instruments such as frequency and percentages while Pearson Product Moment Correlation (PPMC) was used as the inferential statistical tool to test the hypothesis of the study.

Results obtained from the study give it that most of the respondents were married at about 68.3% of the respondents. Majority of the respondents (41.4%) have a farming experience of between 3-7 years. Majorities (82.1%) of the respondents were members of one association or the order and (53.1%) of the respondents has only primary school education. Majority (73.8%) of the respondents sampled have within 3-7 members within their households. An unaffordable hire charge for tillage operation was regarded as the most serious constraint towards public tractor hiring services by the respondents in the study area. Majority (47.6%) of the respondents claimed that the level effectiveness of public tractor hiring services in the study area is moderate. The results obtained from Pearson Product Moment Correlation revealed that some of the selected variables, specifically, farm size ( $r = 0.231$ ,  $p \leq 0.01$ ), income level ( $r = 0.432$ ,  $p \leq 0.01$ ) had significant relationship with the level of effectiveness of public tractor hiring service. Based on the findings of the study, it was concluded that the major sources of information on public tractor hiring utilized by the respondents were from relatives and Extension agents. Also, respondents' major source for public tractor hiring services is from Agricultural Development Programme (ADP) in the study area. Therefore, the study recommended that; The Government should use the Local Government Areas and the extension agents as source of information dissemination to the arable crop farmers in the study area; likewise, Extension agents should be trained and empowered in areas related to tractor usage and the improvement of the state ADP so as to deliver better services in the area of tractor hiring to the respondents.

**Keywords:** Hiring services, Public tractors, Arable crops, Arable crop farmers

## INTRODUCTION

Nigeria is one of the countries in the World that is blessed with both human and material resources (United Kingdom Aid [UKAID], 2012). In terms of human resources, Nigeria has an estimated population of about 163 million people (National Bureau of Statistics [NBS], 2012) that are engaged in agricultural and non-agricultural activities.

Advanced countries in the World that have made remarkable and enviable progress in food production adopted farm mechanization through the use of modern technologies like tractors and other farming implements. For instance, in America 95 percent of her agriculture is mechanized with only 24 percent of her population engaged in agriculture, yet

they produce enough to the extent that they export their outputs to other countries of the World (Ajah, 2014). This portrays the importance of farm mechanization hence, it has been globally virtualized as the pivot to agricultural transformation. The reason for this is based on the fact that it has contributed immensely to the increase in food production and other agricultural raw materials (Akande, 2009).

Although farm mechanization according to Maharjah and Cheltn (2006) encompasses, in its widest sense, hand tools, draught animals and mechanical technologies, tractor is one of the most important mechanical power because it is a major element in farm mechanization (Ishola and Adeoti, 2004).

Since Nigerian farmers have been advised to embrace agricultural mechanization as a way of increasing food production and report by NAERLS and NPFS (2011) indicated that most states in Nigeria including Abuja had some functional tractors, there is every need to identify the factors limiting small-scale farmers access and use of tractors for farm mechanization for farm mechanization in Abuja, Nigeria. This is very important because if tractors are not affordable to farmers or available in public and private offices but not accessible, it makes no meaning to a farmer who needs it for production purposes, Although information on private-owned tractors could not be accessed, it is clear that the number of tractors available was insignificant when compared to the farming population and available land resource in Nigeria. Again, it is necessary because documented evidence revealed that tractors were introduced in Nigeria in the 1950's (Dauda *et al*, 2010) implying that this is not a new technology in Nigeria. Since 1950s till date, the level of adoption and diffusion of farm mechanization should be very high enough for the Nigerian farmers to operate mechanized farms.

About 70% of Nigerians estimated to be 120 million by the National Population Commission (NPC, 1991) are engaged in food production and agricultural related businesses, but the country is still not self-sufficient in food production and supply. With an ever increasing population, it became increasingly difficult to feed the teeming masses and the country resorted to importing food to supplement the one grown at home (Anon, 2005, Alabandan and Yusuf, 2013). As a country, Nigeria is neither in the front row of food producing nor exporting countries of the world (Okereke, 2000). In fact, Nigeria is one of the major importers of food items in the Sub-Saharan Africa. Issues stemming from very little exploration of mechanization as an agricultural practice. To worsen the situation, most of the young and able-bodied men who are supposed to adopt farm mechanization easily are continuously leaving the rural areas for urban citizens in search of jobs with better remuneration. This ugly scenario calls for a serious concern because the inability of Nigeria to feed her teeming population is a pointer to National calamity. This should be addressed because the index for measuring the independence of any nation is her ability to feed her population. In order to improve food production, Nigerian farmers need to adopt farm mechanization due to the fact that it is a means of enhancing human productivity and often with the intention to achieve results beyond the capacity for human labour (FAO, 2008).

Timely information is needed by crop farmers in order to make decision on where to source for power to use on the farm in the form of tractor. Most farmers do not have access to timely information toward tractor hiring or rather get to them late which in most time are no more useful to productive agricultural activities which invariably affect their production and level of income generated in that cropping season. Most farmers find it difficult to determine which types of tractor are needed on their farm based on the types of agricultural practices been engaged in on their farm thereby resulting into destruction of top soil and fragmentation of the farmland.

In order to establish an empirical explanation to some of the claims above, the thrust of this study was to assess the level of effectiveness of public tractor hiring services among arable crop farmers in Oyo Agricultural zone of Oyo State, Nigeria. There is, therefore, the need for thorough insight into the different dimensions of the problem as a means to proposing some solving measures in the effectiveness of tractor hiring service. It is against this background that this research was undertaken.

While specifically, the study described the socio-economic characteristics of the respondents in the study area, examined the sources of information on tractor hiring services in the study area, investigated the types of farm operations carried out by the respondents in the study area, described the frequency of use of tractors by the respondents in the study area, examined the effectiveness of tractor hiring service in the study area, identified the level of benefit derived by the respondents from hiring of tractors in the study area, investigated the constraints militating against the hiring of tractors in the study area.

## METHODOLOGY

This study was carried out in Oyo Agricultural zone of Oyo State, Nigeria. It's an inland state in South-Western Nigeria with capital at Ibadan. It is bounded in the North by Kwara State, in the East by Osun State, in the South by Ogun State and in the West by partly Ogun State and partly by the republic of Benin. Oyo State is predominantly agrarian with about 70 percent rural population (Ajayi, 2001). Majority of the dwellers are predominantly Yoruba people

by ethnicity and little population of other groups including the Hausa people. The area is blessed with fertile land which is suitable for Agriculture.

The population of the study included all the arable crop farmers in Oyo Agricultural zones of Oyo State. A Multistage sampling method was adopted for this study. Oyo Agricultural zone consists of 4 LGAs with each of them representing a Block. The first stage involved a purposive selection of two blocks from Oyo Agricultural zone, that is, Iseyin and Itesiwaju blocks respectively because they are rural base (OYSADEP, 2001). The second stage involved a random selection of forty per cent (40%) of cells from the selected blocks. Therefore, the use of Random table was employed to pick three (3) villages from each of the cells which equaled to a total of six (6) villages. The third stage included a random selection of twenty per cent (20%) of the registered arable crop farmers from the registered villages in each of the three cells. This gave a total number of One hundred and forty-five (145) respondents which constituted the sample size for the study.

Primary data was collected with the aid of a structured interview schedule for this study. However, relevant and current literatures were reviewed for secondary data.

The dependent variable of the study was the effectiveness of public tractor hiring service in the study area. This was measured on a 4 point rating scale of Very Effective (4), Effective (3), Fairly Effective (2) and Not Effective (1). Using mean and standard deviation ( $\bar{x} \pm SD$ ), this was categorized into high, moderate and low effectiveness.

The independent variables of this study included the socio-economic characteristics of the arable crop farmers.

The data for this study was analyzed using both descriptive and inferential statistics tools. Data collected were analyzed with frequency distribution, percentages, mean values and ranking as the main descriptive statistics, Pearson Product Moment Correlation (PPMC) and Chi-square were used to determine the association/relationship between the variables.

## RESULTS AND DISCUSSION

### Socio-economic characteristics of the respondents

The modal age (28%) of the respondents was within the age group 55 - 64 years, 21% were within the age group of 35 - 44 years and 19% of them were within 25 - 34 years of age respectively. However, 17% of the respondents were within the age group of 65-74 years of age, 14% of them were within the age group of 45 - 54 years while 1.0% of them were above the age of 74 years. The mean age of the respondents sampled was 49 years of age. This implies that most of the respondents are still agile and active in their chosen field of work.

Majority (76.6%) of the respondents were male while 23.4% of them were females. This shows male dominance in public tractor hiring among the sampled respondents in the study area. This can also implies that male farmers have access to more input and are mostly large scale farmers which involve the use of more resources, strength and energy to work on their farms. This result is similar to observation of Van Eeredewijk and Danielsen (2015) that labour burden for women was concentrated in weeding, tillage and land preparation; postharvest management and transport of agricultural produce; and chopping and collecting fodder, fetching water and child care.

About 51.7% of the respondents were Muslim and 45.5% of the respondents were Christians. However, small proportions (2.8%) of the respondents were traditional worshippers. This indicates that a higher percentage of the respondents believe in the existence of a supreme being whom they believe oversees their affair. The implication of this is that respondents' religion affiliations do not affect their access to the use of tractor in the study area.

About 68.3% of the respondents were married while 15.2% of them were widowed. 10% each of the respondents were single and divorced respectively. Also, 2.8% of them were separated. This means that a higher percentage of them were married which indicates that they are socially responsible.

Majority (73.8%) of the respondents sampled have within 3-7 persons while 23.4% possessed 8-12 persons in their household. However, 1.4% of the respondents have 13-17 and 18-22 persons as their household size respectively. The mean household size of the respondents was 7 persons. This indicates that a small proportion of the respondents kept a large household size. This may be due to the fact that access to public tractors has catered for the instinct to produce more household size. This finding is in agreement with Ajah (2014) observed that farmers with large household sizes may not be interested in hiring tractor because able and grown-up ones can be used as farm labour.

About 41.4% of the respondents have a farming experience of between 3-7 years, 28.3% have an experience of 13-22 years while 22.1% of the respondents have farming experience between 13-22 years. Also, 6.9% of them have a farming experience between 33-42 years while 1.4% of them have a farming experience of between 43-52 years. The mean year

of experience in farming was 18 years. This indicates that large percentages (41.4%) of the farmers have low experience in farming and this can negatively affect their decision to use inputs including tractor which in return affects their productivity.

The average year spent schooling was 8 years. More than (53.1%) of the respondents have primary school education and 30.3% of them have secondary school education and 9.7% of the respondents have Tertiary education while 6.9% have no formal education. This signifies that a little above the average (53.1%) of the respondents have primary school education but this can be a hindrance to use of tractor in the study area as illiterate farmers may find it difficult to evaluate the importance of the effectiveness of a particular innovation.

Majority (82.1%) of the respondents indicated that they were members of one association or the other while 17.9% of the respondents did not belong to any association. This indicates that majority of the respondents belonged to an association.

#### **Sources of information on public tractor hiring service**

Majority (98.6%) each of the respondents sought information on tractor hiring service from Extension agents and relatives in the study area. 97.2% each of them sourced for their information on tractor hiring from family, friends, farmers' field day and farmers' field trip respective while 95.9% of the respondents sought for information from research institute. However, political campaign (79.3%), fliers (67.6%), Handbills (65.5%), and Short Message Services (SMS) (45.4%) were the least utilized sources of information on tractor hiring in the study area. This indicates that Extension agents and relatives were the main source of information available to the respondents while SMS was least favoured as source of information on tractor hiring service in the study area.

#### **Source of tractor hiring**

Majority (93.1%) of the respondents claimed that they hired tractor from the Local Government Area, 92.4% of the respondents signified that they sourced for tractor from Agricultural Development Programme (ADP) in the study area and 89% of the respondents hired from the Federal Ministry of Agriculture and Rural Development. However, 55.9% of the respondents hired tractors from the Federal Capital Development Authority (Agricultural Unit) in the study area. This indicates that highest percentage of the respondents hired their tractor from the local government Area while the lowest percentage of them hired from Agricultural Unit of the Federal Capital Development Authority in the study area.

#### **Types of farm operation carried out by the respondents**

All(100%) of the respondents involved in land clearing, ploughing and planting respectively. 98.6% of the respondents involved the use of tractor during harvesting, 94.5% each during harrowing and haulage of farm produce. However, 55.9% of the respondents used tractor during the process of ridging the soil, 55.2% of them involved the use of tractor during the shelling operation of their farm produce, 24.8% during slashing of the field while 18.6% of them utilized tractor during agrochemical application of their farm.

This indicates that respondents in the study area mostly utilize tractor during land clearing, ploughing and planting operations on the farm while they barely involved in the utilization of tractors during the process of agrochemical application. This implies that the farmers in the may not be aware that tractors can also be used for ridging, shelling operation, bush slashing and agrochemical applications.

#### **Frequency of hiring of public tractor for farm operation**

About 84.4% each of the respondents hired tractor for operation and haulage virtually every time, 56.9% of the respondents occasionally hire tractor for land clearing while 54.5% of the respondents hired tractor every time during the planting season in the study area.

However, around 40% of the respondents never hired tractor for the following farm operations in the study area; slashing (40%), ploughing (77.9%), agrochemical applications (76.6%) and harvesting (84.8%). The result revealed that amongst the farm operations involved by the respondents in the study area, planting operation was ranked first with a Weighted Mean Score (WMS) of 3.72. Ranked in the second position was the haulage (WMS = 3.61) of farm produce by the respondents while land clearing (WMS = 3.18) occupied the third position.

In contrast, the use of tractor for slashing (WMS = 1.41) operation on the farm was ranked sixth on the table, ploughing was ranked seventh with a WMS of 1.37, harvesting was ranked eight position with a WMS of 0.39 while agrochemical application (WMS = 0.29) was ranked lowest in the ninth position.

The indicates that most of the respondents frequently use tractor for planting operation and haulage activities on the farm while the lowest proportion of them have a reduced frequency of tractor hiring tractor for agrochemical application including fertilizers.

### Charges paid in naira per day by the respondents on farm operations

The result revealed that between 5000-7500 naira was paid for land clearing, the cost of ploughing ranged between 4000-6700 naira per day while harrowing of farm was between 5000-7000 naira per day. Furthermore, ridging of farm land was between 5000-7000 naira per day, Weeding operation was done at the range of 4000-7000 naira per day, 1200-2500 naira was paid per day for agrochemical application while planting operation was done at a range of 1700-2100 naira per day. Also, at a cost which ranged between 4000-6000 naira was stipulated for slashing operation, haulage of farm produce was done between the costs of 5000-7000 naira per day, harvesting of crop was performed between the costs 5000-7500 naira per day while shelling was done between 4000-8000 naira per day. The indicates that costs placed on these farm operations were not specific but ranged between a certain amounts of money based on the bargaining power of the respondents regarding the farm operations, farm size and the distance to farm to be operated on and source of energy for the tractor to work with which when added to other costs of operation will increase the cost of production for the small scale farmers in the study area.

### Benefit derived from tractor hiring service in the study area.

Majority (95.2%) of the respondents claimed that they derived a major benefit from quality and good yields of farm produce, Quality and good yield of farm produce (WMS = 1.95) was ranked first, increase in income and large cultivable land (WMS = 1.92) each were ranked second and third respectively while increase in cropping intensity of crops (WMS = 1.90) was ranked fourth. However, improved spacing of crops (WMS = 1.88) was ranked fifth, food security and improved nutrition for the farm family (WMS = 1.83) was ranked in the sixth position while timely planting (WMS = 1.79) was ranked seventh. The implication of this result is that the respondents showed that quality and good yield is the most ranked benefit derived from tractor hiring while timely planting is the least ranked of the benefits derived from hiring public tractors in the study area.

### Categorization of the respondents by benefit derived from tractor hiring service

About 78.6% of the respondents claimed that public tractor hiring is beneficial to them while 21.4% of them agreed that the hiring of tractor is not beneficial to them. This shows that more than average of the respondents benefitted from public tractor hiring services in the study area. This may probably show the level of education of the respondents which may have spurred their awareness of the presence of public transport hiring services in the study area.

### Effectiveness of public tractor hiring service

Around 83.4% of the respondents submitted that the use of tractor during the process of ploughing of agricultural farmland for planting is effective, 80% of the respondents agreed that tractors are also effective in the preparation of soil for arable crops that thrive well on ridged soil. Conversely, a little below average (41.4%) of the respondents insisted that using tractor as a source of energy in generating electricity was fairly effective while more than average (52.4%) of the respondents were in disagreement with the notion that tractors are effective during the process of pre and post-application of agrochemicals on farm land. The result on the table also revealed that ploughing of agricultural farm using tractor (WMS = 2.89) was the most ranked statement in the measurement of the effectiveness of tractor hiring service. Also, preparation of soil for arable crops that thrive well on ridged soil (WMS = 2.85) was ranked second on the log, tractor coupled with a trailer for hauling agricultural produce (WMS = 2.85) ranked third, the process of planting of seed during planting operation (WMS = 2.48) ranked fourth and harrowing of farmland for proper root formation (WMS = 2.34) ranked fifth.

However, operations that involve the clearing of farmland for crop production was ranked sixth, followed by tractors as a source of energy in generating electricity (WMS = 0.94) ranked seventh and use of tractor during the process of pre and post-application of agrochemicals on farmland (WMS = 0.68) which was the least ranked in the eighth position.

### Level of effectiveness of public tractor hiring services

The result revealed that 47.6% of the respondents rated the level of effectiveness of public tractor hiring services in the study area as moderate (19.48 – 15.56) while 29.0% of them rated the level of effectiveness of public tractor hiring services as high with a score of 19.49. However, 23.4% of the respondents rated the level of effectiveness of public tractor hiring services in the study area as low (15.57). This indicates that a larger percentage of the respondents rated the effectiveness of public tractor hiring services in the study area as moderate. This implies that the categories of respondents that rated the level of effectiveness as low can still move up the hierarchy of the categorization through sensitization program and awareness of other usefulness of tractors rather than the usual planting operation and haulage of agricultural inputs which are synonymous with the study.

### Constraints militating against public tractor hiring services

Majority of the respondents agreed that the following were the very serious constraint militating against hiring tractor in the study area: Unaffordable hire charges (94.5%), fuel scarcity (93.1%), (91.7%) each of lack of spare part and destruction of farm boundary respectively. Moreover, the following were ranked high, based on weighted mean score, in their perceived constraints militating against hiring of tractors in the study area; unaffordable hire charges (WMS = 2.94)

was ranked first, fuel scarcity was ranked second (WMS = 2.93), Destruction of farm boundary (WMS = 2.92) was ranked third and unfaithful/incompetent operator with weighted mean score of 2.90 was ranked fourth. However, the following constraints were ranked lowest; inflexible and inefficient public sector administration (WMS = 2.78) ranked eleventh, small fields with long travel distances (WMS = 2.56) ranked twelfth, non-sustainability of subsidies required to keep the public tractor hire service running (WMS = 2.38) ranked thirteenth and poor infrastructure (WMS = 2.30) ranked fourteenth. This indicates that the respondents perceived unaffordable hire charges for tillage operation as a very serious constraint towards public tractor hiring services in the study area. This may be due to the distance to the targeted farm, availability of fuel or energy for the operation of tractor in the study area.

### Test of hypothesis

**H<sub>01</sub>:** The hypothesis of the study was started in null form as follows, For this hypothesis, PPMC analysis was employed and the result as shown on Table15 revealed that some of the selected variables, specifically farm size ( $r = 0.231$ ,  $p \leq 0.01$ ), income level ( $r = 0.432$ ,  $p \leq 0.01$ ) had significant relations with the level of effectiveness of public tractor hiring service. This implies that the respondents feel that the larger the farm size the more effective is the public tractor hiring service in the study area.

Similarly, the higher the income level of the respondents, the more effective is the public tractor hiring service in the study area. This means that the respondents may be able to commit more of their income into hiring of public tractors which in turn improve their productivity due to increase investment on their farming activities.

**H<sub>02</sub>:** There is no significant association between types of farm operation carried out by the arable crop farmers using tractor and the level of effectiveness of public tractor hiring service in the study area. For this hypothesis, Chi-square analysis was used and the result, as shown in Table16, revealed that a significant association ( $p = 0.01$ ) existed between types of farm operation carried out by the respondents such as Harrowing ( $\chi^2 = 114.77$ ,  $p < 0.01$ ), Haulage ( $\chi^2 = 137.11$ ,  $p < 0.01$ ) and level of effectiveness of public tractor hiring service in the study area. This implies that the higher the level of effectiveness of tractor hiring service in the study area, the high the arable crop farmers hire tractors to harrow their farm land. Similarly, the higher the effectiveness of tractor hiring service, the better the arable crop farmers hire tractors for haulage service during the planting season. Conversely, there was no significant relationship between types of farm operation carried out by the respondents; ridging, agrochemical application, harvesting, shelling and mowing; and level of effectiveness of public tractor hiring services. This implies that there is no association between these farm operations and level of effectiveness of public tractor hiring services in the study area. This indicates that the arable crop farmers do not usually use their hired tractors during the planting season for the farm operations that were not significantly associated with the level of effectiveness of public tractor hiring service.

## CONCLUSION AND RECOMMENDATION

Based on the findings of the study, it is concluded that a sizeable number of the respondents were men, young and very agile. Also, the major sources of information on public tractor hiring utilized by the respondents were from relatives and Extension agents. Majority of the respondent claimed that they sourced for public tractor from Agricultural Development Programme (ADP) in the study area. Likewise, land clearing, ploughing and planting were the types of farm operation they frequently utilized tractor for. Farm size and income level had a significant relationship with the level of effectiveness of public tractor hiring service in the study area.

Hence, as a result, it is recommended that Local Government Areas under which the research was undertaken should organize a training programme that will focus on the young adults in order to empower them such as improving their driving skill of public tractors, land measurement skill and so on with a view to improving food security in the study area, The Government should use the Local Government Areas and the extension agents as source of information dissemination to the arable crop farmers in the study area and Public tractor hiring charges should be subsidized heavily in order to allow the arable crop farmers to have more access to tractors and also to open up more land so as to improve arable crop production in the study area.

**Table 1: Distribution of Respondents by Their Socio-Economic Characteristics**

Socio-economic characteristics	Frequency	Percentage	Mean
<b>Sex</b>			
Male	111	76.6	
Female	34	23.4	
<b>Religion</b>			
Islam	75	51.7	
Christianity	66	45.5	
Traditional worshipper	4	2.8	
<b>Marital status</b>			

Married	99	68.3	
Single	10	6.9	
Separated	4	2.8	
Divorced	10	6.9	
Widow	22	15.2	
<b>Household size</b>			
3 – 7	107	73.8	
8 – 12	34	23.4	
13 – 17	2	1.4	
18 – 22	2	1.4	<b>7</b>
<b>Farming experience(years)</b>			
3 – 12	60	41.4	
13 – 22	32	22.1	
23 – 32	41	28.3	
33 – 42	10	6.9	
43 – 52	2	1.4	<b>18</b>
<b>Years of schooling(years)</b>			
No formal education	10	6.9	
Primary education	77	53.1	
Secondary education	44	30.3	
Tertiary education	14	9.7	<b>8</b>
<b>Membership of an association</b>			
Member	119	82.1	
Non-member	26	17.9	

**Source: Field survey, 2018**

**Table 2: Distribution of respondents by source of information on tractor hiring**

Source of information on tractor hiring	Frequency*	Percentage
Extension Agents	143	98.6
Research institute	139	95.9
Radio jingle	121	83.4
Television	131	90.3
Family	141	97.2
Relatives	143	98.6
Neighbour	135	93.1
Posters	117	80.7
Cooperative Society	137	94.5
Friends	141	97.2
Handbills	95	65.5
Fliers	98	67.6
SMS	66	45.5
Extension Bulletins	127	87.6
Newspaper and Magazines	131	90.3
Political campaign	115	79.3
Farmers field trip	141	97.2
Seminar and Workshop	132	91.0
MTRM-Monthly Technological Review Meeting	130	89.7

**Source: Field survey, 2018**

**\*Multiple responses**

**Table 3: Distribution of respondents based on the source of tractor hiring**

Source of tractor hiring	Frequency*	Percentage
Agricultural Development Programme (ADP)	134	92.4
Federal Ministry of Agriculture and Rural development	129	89.0
Local Government Area	135	93.1
Federal Capital Development Authority (Agriculture Unit)	81	55.9

**Source: Field survey, 2018**

**\*Multiple responses**

**Table 4: Distribution of respondents by type of farm operation carried out using tractor**

Farm Operation	Frequency	Percentage
Land clearing	145	100
Ploughing	145	100
Harrowing	137	94.5
Ridging	81	55.9
Agrochemical application	27	18.6
Planting	145	100
Haulage	137	94.5
Harvesting	143	98.6
Shelling	80	55.2
Slashing	36	24.8

Source: Field survey, 2018

**Table 5: Distribution of respondents by frequency of hiring of tractors by the respondents**

Farm Operation	Every time	Almost every time	Occasionally	Rarely	Never	WMS	Rank
Land clearing	65(44.8)	12(8.3)	68(56.9)	0(0.0)	0(0.0)	3.18	3 <sup>th</sup>
Ploughing	113(77.9)	16(11.0)	16(11.0)	0(0.0)	0(0.0)	1.37	7 <sup>th</sup>
Harrowing	37(25.5)	16(11.0)	88(60.7)	2(1.4)	2(1.4)	2.58	5 <sup>th</sup>
Ridging	79(54.5)	12(8.3)	50(34.5)	2(1.4)	2(1.4)	3.13	4 <sup>th</sup>
Agrochemical application	2(1.4)	2(1.4)	12(8.3)	18(12.4)	111(76.6)	0.29	9 <sup>th</sup>
Harvesting	2(1.4)	2(1.4)	10(6.9)	8(5.5)	123(84.8)	0.39	8 <sup>th</sup>
Haulage	123(84.8)	8(5.5)	6(4.1)	4(2.8)	4(2.8)	3.61	2 <sup>nd</sup>
Slashing	20(13.8)	19(13.1)	20(13.8)	28(19.3)	58(40.0)	1.41	6 <sup>th</sup>
Planting	123(84.8)	10(6.9)	8(5.5)	2(1.4)	2(1.4)	3.72	1 <sup>st</sup>

Source: Field survey, 2018.

**Table 6: Distribution of respondents by charges per operation rendered in Naira/day per Acre**

Farm Operation	Amount/day
Land clearing	5000-7500
Ploughing	4000-6700
Harrowing	5000-7000
Ridging	5000-7000
Weeding	4000-7000
Agrochemical application	1200-2500
Planting	1700-2100
Slashing/Mowing	4000-6000
Haulage	5000-7000
Harvesting	5000-7500
Shelling	4000-8000

Source: Field survey, 2018.

**Table 7: Distribution of respondents by benefits derived from tractor hiring by the respondents**

Benefits derived	Major benefit	Minor benefit	No benefit	WMS	Rank
Increase in Income	133(91.7)	12(8.3)	0(0.0)	1.92	2 <sup>nd</sup>
Larger cultivable land	133(91.7)	12(8.3)	0(0.0)	1.92	2 <sup>nd</sup>



Quality and good yields	138(95.2)	7(4.8)	0(0.0)	1.95	1 <sup>st</sup>
Timely planting	119(82.1)	22(15.2)	4(2.8)	1.79	7 <sup>th</sup>
Improved spacing of crops	127(87.6)	18(12.4)	0(0.0)	1.88	5 <sup>th</sup>
Increase in cropping intensity	131(90.3)	14(9.7)	0(0.0)	1.90	4 <sup>th</sup>
Food security and improved nutrition for the farm family	123(84.8)	20(13.8)	2(1.4)	1.83	6 <sup>th</sup>

Source: Field survey, 2018.

Table 8: Level of benefit derived from tractor hiring by the respondents

Level of benefit derived	Score	Frequency	Percentage
Beneficial	≥1.9	114	78.6
Not-beneficial	<1.9	31	21.4

Source: Field survey, 2018

Grand mean = 1.9

Table 9: Distribution of respondents by effectiveness of public tractor hiring service

Statement	Very Effective	Effective	Fairly Effective	Not Effective	WMS
Operations that involve the clearing of farmland for crop production	42(29.0)	13(9.0)	20(13.8)	70(48.3)	1.19
Use of tractor during the ploughing of agricultural farm for planting	4(2.8)	121(83.4)	20(13.8)	0(0.0)	2.89
In the case of harrowing of farmland for proper root formation	49(33.8)	96(66.2)	0(0.0)	0(0.0)	2.34
Preparation of soil for arable crops that thrive well on ridged soil	4(2.8)	116(80.0)	24(16.6)	1(0.7)	2.85
Tractor effectiveness during the process of planting of seed during planting operation	4(2.8)	86(59.3)	31(21.4)	24(16.6)	2.48
During the process of pre and post-application of agrochemicals on farmland	0(0.0)	30(20.7)	39(26.9)	76(52.4)	0.68
Tractor coupled with a trailer for hauling agricultural produce	6(4.1)	114(78.6)	13(9.0)	12(8.3)	2.79
As a source of energy in generating electricity	20(13.8)	8(5.5)	60(41.4)	57(39.3)	0.94

Source: Field survey, 2018.

Table 10: Categorization of the respondents by level of effectiveness of public tractor hiring services

Level of public tractor hiring service	Score	Frequency	Percentage
High	≥ 19.49	42	29.0
Moderate	19.48 – 15.56	69	47.6
Low	≤ 15.57	34	23.4

Source: Field survey, 2018

Mean = 17.53

Standard deviation = 1.96

Table 11: Distribution of respondents by constraints militating against tractor hiring services

Constraints	Very Serious constraint(3)	Serious constraint(2)	Mild constraint(1)	Not a serious(0)	WMS	Rank
Fuel scarcity	135(93.1)	10(6.9)	0(0.0)	0(0.0)	2.93	2 <sup>nd</sup>
Unaffordable hire charges for tillage operations	137(94.5)	8(5.5)	0(0.0)	0(0.0)	2.94	1 <sup>st</sup>
Frequent tractor breakdown	127(87.6)	18(12.4)	0(0.0)	0(0.0)	2.88	7 <sup>th</sup>

Poor infrastructure	48(33.1)	93(64.1)	4(2.8)	0(0.0)	2.30	14 <sup>th</sup>
Unfaithful/incompetent operator	131(90.3)	14(9.7)	0(0.0)	0(0.0)	2.90	4 <sup>th</sup>
Inadequate tractor	128(88.3)	13(9.0)	4(2.3)	0(0.0)	2.86	9 <sup>th</sup>
Lack of spareparts / mechanic incentive	133(91.7)	10(6.9)	2(1.4)	0(0.0)	2.89	5 <sup>th</sup>
Small fields with long travel distances	83(57.2)	60(41.4)	2(1.4)	0(0.0)	2.56	12 <sup>th</sup>
Inflexible and inefficient public sector administration	117(80.7)	24(16.6)	4(2.8)	0(0.0)	2.78	11 <sup>th</sup>
Non-sustainability of subsidies required to keep the public tractor hire service running	59(40.7)	82(56.6)	4(2.8)	0(0.0)	2.38	13 <sup>th</sup>
Government policy	129(89.0)	16(11.0)	0(0.0)	0(0.0)	2.89	5 <sup>th</sup>
Instability in the price of the farmers' produce	126(86.9)	19(13.1)	0(0.0)	0(0.0)	2.87	8 <sup>th</sup>
Poor accessible road to farms	129(89.0)	12(8.3)	4(2.8)	0(0.0)	2.86	9 <sup>th</sup>
Destruction of farm boundary	133(91.7)	12(8.3)	0(0.0)	0(0.0)	2.92	3 <sup>rd</sup>

Source: Field survey, 2018

Table 12: Summary of correlation analysis showing relationship between some selected socio-economic characteristics of the respondents and the level of effectiveness of public tractor hiring service

Socio-economic Variables	Correlation coefficient(r)	p-value	Remark	Decision
Age	0.174	0.360	NS	Accept H <sub>0</sub>
Household size	- 0.095	0.255	NS	Accept H <sub>0</sub>
Farming experience	0.122	0.143	NS	Accept H <sub>0</sub>
Farm size	0.239**	0.000	S	Reject H <sub>0</sub>
Income level	0.432**	0.000	S	Reject H <sub>0</sub>
Years of schooling	- 0.059	0.483	NS	Accept H <sub>0</sub>

Source: Field survey, 2018

S- Significant NS – Not Significant \*\*Significant at 0.01 level (2-tailed).

Table 13: Table showing types of farm operation carried out by the respondents and the level of effectiveness of public tractor hiring service

Type of farm operations carried out by the responden	$\chi^2$ -cal	df	p-value	Remark	Decision
Harrowing	114.77	2	0.00*	S	Reject H <sub>0</sub>
Ridging	1.99	2	0.16	NS	Accept H <sub>0</sub>
Agrochemical application	107.76	2	0.35	NS	Accept H <sub>0</sub>
Haulage	104.57	2	0.00*	S	Reject H <sub>0</sub>
Harvesting	137.11	2	0.65	NS	Accept H <sub>0</sub>
Shelling	1.55	2	0.21	NS	Accept H <sub>0</sub>
Mowing	36.75	2	0.45	NS	Accept H <sub>0</sub>

Source: Field survey, 2018

\*Significant at 0.01 level df: degree of freedom S: Significant NS: Not significant

## REFERENCES

- Ajah, J.(2014) Factors Limiting Small-Scale Farmers' Access and Use of Tractors for Agricultural Mechanization in Abuja, North Central Zone, Nigeria. European Journal of Sustainable Development, 3, 1, 115-124
- Akande, L.O. (2009). Effects of Agriculture Mechanization on environmental Management in Nigeria: An overview, J. Pure Sci. SciEdu. 4(2): 101-118.
- Alababan B. A. and Yusuf Y. (2013): Tractor hiring schemes in Nigeria: A case study of Federal Capital Territory (FCT), Nigeria: African Journal of Agricultural Research. Vol. 8(47), pp. 5962-5966

4. Dauda S. M., Agidi G. and Shotunde M. A. (2010): Agricultural Tractor ownership and Off-season Utilization in Ogun State South Western Nigeria, *African Journal of Agriculture*, 6(3): 95-103
5. Dauda S.M, John J. M., and Desa A.,(2012): Mechanization Effect on Farm Practices in Kwara State, North Central Nigeria.
6. FAO / UNIDO (2008): Agricultural mechanization in Africa: Time for action, Planning investment for enhanced agricultural production: Report of an expert group meeting, Food and Agriculture Organization of the United Nations, Rome, pp 1-36.
7. Ishola, T.A. and Adeoti J.S. (2004): A study of Farm Tractors Reliability in Kwara State of Nigeria, proceedings of the annual Conference of the Nigerian Institution of Agricultural Engineers, Kwara State, Nigeria November 28-December 2, 2004. (proceeding NIAE: Vol. 26
8. Maharjan, K.L., and Cheltri A.K. (2006): Household Food Security in Rural areas of Nepal: Relationship between socio-economic characteristics and food security status. Paper presented at the international Association of Agricultural economics Conference. Gold Coast, Australia, August, 12-26.
9. NAERLS and NPFS (2011): Agricultural Performance Survey of 2011 Wet Season in Nigeria National Report. National Agricultural Extension and Research Liaison Services and National Programme for Food Security, Federal Ministry of Agriculture and Rural Development, Nigeria, Pp 1-175.
10. National Population Commission (NPC), (2006). Population and Housing Census: Enumerators' Manual, Federal Republic of Nigeria, pp.1 -16.
11. Nigeria Bureau of Statistics [NBS], (2012): Gross domestic product for Nigeria (2011 and Q1 2012). Plot 762, Independence Avenue, Central Business District, Abuja Federal Government of Nigeria, National Bureau of Statistics, Nigeria, pp: 1-15.
12. Okereke, S.N. (2000) Developing Agricultural Human Resource Base for increased Food Production in the next Millennium. In: Ajah J.(2014) Factors Limiting Small-Scale Farmers' Access and Use of Tractors for Agricultural Mechanization in Abuja, North Central Zone, Nigeria. *European Journal of Sustainable Development*, 3, 1, 115-124.
13. UKAID, (2012): Gender in Nigeria Report 2012: Improving the Lives of Girls and Women in Nigeria: Issues, Policies, Action (2nd edition, pp. 1-99), British Council, Nigeria

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