Agricultural production/activities in Nigeria over the past years have largely remained primitive, resulting in very low productivity due to inadequate application of modern technology. There have also been daunting challenges of access to long-term capital needed to employ modern farming equipment, inadequate inputs and storage facilities, weak agricultural extension and out-dated sectoral infrastructure, all resulting to years of low agricultural productivity. Hence, this study investigates the impact of agricultural equipment financing on increased productivity in the Agricultural sector in Nigeria. The study employs the archival and documentary research design which involves secondary data collection. 16 years data on total annual financial expenditure on agricultural equipment and data for agricultural output and export earnings from 2000 to 2015 (16 years) form the population of the study. Data on cumulative annual expenditure on agricultural equipment financing (AEF), an aggregate of technological advancement in mechanized farming (TMF) and agricultural productivity (AP), were employed. The findings reveal that agricultural equipment financing has a significant impact on technological advancement of mechanized farming and that there is a significant relationship between technological advancement of mechanized farming and production output. The study therefore recommends that efforts should be made by agricultural intervention agencies and financial institutions to increase credit financing for agricultural equipment, which is a sustainable measure towards revolutionizing and industrialisation of the economy through technological advancement in the sector.

**Keywords:** Agriculture, Equipment Financing, Mechanization, Productivity, Growth

**1.1 Introduction:**
In Nigeria, agriculture has been traditionally considered as the mainstay of the economy in spite of the growing importance of oil exploration thereby making Nigeria remain essentially an agrarian economy. In the context of the Nigerian economy, agriculture is tied to the various sectors and is essentially for generating broad-based growth and development. The development of agriculture is as old and closely associated as the evolution of mankind, since food is one of the essentials of life, necessitating the dominant role of agriculture in any nation’s development and growth, be it a developed, developing or an under-developed economy. Agriculture serves as both the main traditional occupation and the key to the sustained growth of most developing countries. Stagnation in agriculture is the principal explanation for poor economic performance, while rising agricultural productivity has been the most important concomitant of successful industrialization (Abayomi, 1997).

Nigeria, asserted by Onwualu (2009b), is greatly endowed with a variety of agricultural produce which can provide the stimulus for the growth of processing industries. Value addition in agricultural produce provides ample opportunities for revenue generation and employment
creation. Value addition is a vital component of the overall strategy towards addressing agricultural productivity, curbing post-harvest losses and ensuring food security (Adama, Obasi & Onwualu, 2006; FAO, 2012). Processing agricultural produce into various innovative products promotes market acceptability and gives the products high economic value (Onwualu, 2012). This increases productivity and contributes to economic growth; hence, the need for technology.

Technological applications in the agricultural sector (farm mechanization and processing equipment) have been seen as the pivot for agricultural revolution in many parts of the world; this has greatly contributed to increased output of food crops and other agricultural products to meet the demands of the ever-increasing world population (Akande, 2009). Mechanization of agriculture has solved food scarcity problems in many countries. In the case of the United States of America, only about 3 percent of the entire population are engaged in farming, with an average American farmer producing enough food to feed thousands (Srivastava, Carrol, Roger & Dennis, 2006).

Technological advancement in agriculture, according to Dhiri (2014), is one of the key determinants of high and sustained agricultural productivity and growth over the longer term. It remains a vital economic driver for developed and developing countries and plays critical and significant roles in industrialising economies, especially in low-income countries. The agricultural sector generates a substantial level of revenue and increases real incomes (Christiaansen & Demery, 2007). It employs an estimated 70 percent of the work-force in low-income countries and is a major contributor to economic growth, measured by the Gross Domestic Product (GDP) (World Bank, 2007). However, there has not been much improvement in the growth rate of agricultural productivity in Nigeria; the growth rate for the agricultural sector in 2000 was 4.7%, a slight improvement on the 4.5% recorded in 1999 and 4.25% recorded in 1998 (Olaitan, 2005). The more recent growth rates are 5.9%, 5.6% and 4.0% for the years 2009, 2011 and 2012 respectively; resulting in drop of the GDP growth rate of 7.0%, 7.4% and 6.6% for the respective years (Central Bank of Nigeria, 2013).

1.2 Statement of the Problem:
Agricultural operations in Nigeria over the past years have largely remained primitive with very low productivity due to inadequate applications of modern technology. The cost of agricultural machinery like tractors, harvesters, planters, and so on, is astronomically high and unaffordable for an average Nigerian farmer. This is complicated by the daunting challenge of accessing long-term finance to acquire needed technology to expand their farms, invest in productive assets or buy inputs. This is owing to the fact that, agricultural financing has, for several years, suffered major setbacks through some inhibiting factors, which include low agricultural productivity, lack of capital and inaccessibility to credit facilities, inadequate availability of inputs and storage facilities, a lack of conducive and enabling environment, weak agricultural extension and out-dated sectoral infrastructure. Extant literature revolves around agricultural productivity, financing, economic growth and development; there is however dearth of literature focused on agricultural technological (equipment) financing as it affects productivity and industrialisation in Nigeria; hence, this study.

1.3 Objectives of the Study:
The broad objective of this study is to investigate the implications of agricultural equipment financing on productivity and industrialisation in Nigeria. The specific objectives are:
1. to determine the impact of agricultural equipment financing on the advancement of mechanized farming in Nigeria
ii. to examine the relationship between mechanized farming and increased agricultural productivity in Nigeria

1.4 Statement of Hypotheses:
From the specific objectives, the following null hypotheses were posited:

\( H_01: \) That Agricultural equipment financing has no significant impact on the (technological) advancement of mechanized farming in Nigeria

\( H_02: \) That there is no significant relationship between (technological) advancement of mechanized farming and increased Agricultural productivity in Nigeria.

2.0 Literature Review:

2.1 The Conceptual Framework:

Agriculture has been defined as the production of food and livestock and the purposeful tendering of plants and animals; it is the mainstay of many economies and it is fundamental to the socio-economic development of a nation because it is a major element in national development (Ahmed, 1993; Zubeiru, 2017). In the same view, Okolo (2004) described the agricultural sector as the most important sector of the economy which holds a lot of potentials for the future economic development of the nation owing to its contribution of about 40% of Nigeria’s GDP and provision of livelihood to about 70% of the population. According to Zubeiru (2017), six different contributions of agriculture can be identified to include food, livelihood, market, industrial raw materials, foreign exchange earnings and a source of savings. Today, Nigeria is no longer a major exporter of cocoa, groundnuts (peanuts), rubber produce and palm oil due to overdependence on petroleum as main source of revenue (Onwualu, 2009).

The challenges and constraints that have made it impossible for Nigeria’s agriculture to be developed, according to Onwualu (2010), and Olagunju, Babatunde and Salimonu (2012), include:

Lack of appropriate technology and machinery for the production and processing of agricultural products: The obsolete nature of existing machinery and equipment constitute a great hindrance to processing of raw materials in the country (Onwualu, 2009). Most of the processing equipment is out-dated and lack the necessary spare parts for their maintenance. Consequently, the efficiency and product quality of the industries are greatly affected. This often contributes to the frequent breakdown and closure of such industries (Olagunju, Babatunde & Salimonu, 2012).

There are difficulties in accessing credit facilities for investment in agriculture; for instance, investments in the sector are usually capital-intensive and consequently, fund sourcing has become a necessary aspect of the enterprise. In fact, it is extremely difficult to access credit for working capital from the financial institutions for agribusiness ventures. The high cost of funding arises from the depreciation of the local currency (Naira) against major currencies coupled with high lending rates. Presently, the lending rates fluctuate between 21% and 24% in some banks. The high lending rate encourages services or businesses such as trading and importation rather than productive ventures in the agricultural sector (Olagunju, 2013).
2.1 The Concept of Agricultural Financing:
Agricultural finance is the acquisition and use of capital in agriculture. It deals basically with the supply of and the demand for funds in the agricultural sector of the economy. USAID (2010) defined rural agricultural finance to include all types of finance available to farmers. It is a field of work in which people aim to improve access to efficient sustainable financial services for the agricultural industry, including farming and all related enterprises. It involves all financial services, including savings, transfers, insurance and loans, input supply, processing, wholesaling and marketing. IFAD (2010) further added that agricultural finance refers to all those financial services that focus on on-farm activities and agricultural businesses without necessarily targeting poor people. The crucial role of financing in agriculture cannot be overemphasised. The escalating world population is associated with greater pressures on food and the demand for agro-products that are inputs for further production, thus the need for the use of more sophisticated methods capable of yielding greater outputs is essential (Mbufor, Ochu & Okafor, 2013). Finance in agriculture is very important for improved productivity as technical inputs can only be purchased and used by farmers if they have the required fund at their disposal.

Agricultural finance deals with the financial aspects of the farm business. It includes both macro and microfinance aspects of an agricultural economy. Various scholars consider agricultural finance as underestimated. For instance, agricultural finance is seen as the study of financing and liquidity services or credit provided to farm borrowers. It is also considered as the study of those financial intermediaries who provide loanable funds to agriculture and the financial markets in which these intermediaries obtain their loanable funds. Furthermore, agricultural finance is also seen as the economic study of the acquisition and use of capital in agriculture which deals with the supply and demand for funds in the agricultural sector of the economy (Nzotta & Okereke, 2009).

2.2 Agricultural Mechanization:
Farm mechanization has been seen as the pivot of 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. Through farm mechanization, many industrial raw materials are produced for the rapidly expanding world industries (Ituen, 2009). The mechanization of agriculture has solved food scarcity problems in many countries. In America, only about 3 percent of the population are engaged in farming, feeding the whole population and still exporting (Srivastava et al, 2006). In India, after a severe famine due to the menace of droughts and floods, concerted efforts by the Indian government evolved in researches in Universities and agricultural institutions which developed experimental plot machines, high yielding varieties of crops and associated production and protection technologies which brought about a green revolution (Ituen, 2009).

Agricultural mechanization in Nigeria can be classified into three levels of technology: Hand-Tool Technology (HIT), Draught Animal Technology (DAT) and Engine-Powered Technology (EPT) (Odigboh and Onwualu, 1994). However, for the purpose of this study, the focus is on the engine-powered technology. According to Ugwuishiwu and Onwualu (2009), the Engine-Powered Technology is the highest and most modern level of agricultural mechanization. It refers to a very wide range of implements, machines and equipment powered by a similarly wide range of mobile or stationary motive sources (engines and motors), using petroleum fuels or electricity; power sources and their associated implements are available in size, power rating, level of sophistication and technical complexity that vary tremendously.
Agricultural mechanization has further been described as the development, introduction and use of mechanical assistance of all forms and at any level of technological sophistication in agricultural production. Odigbo (2000) described this as machines to accomplish operational tasks in agricultural production with reductions in human drudgery, improvement of timeliness and efficiency of various agricultural operations, bringing more land under cultivation, preserving the quality of agricultural products, providing better rural living conditions and markedly advancing the economic growth (Azogu, 2009). The primary objective of agricultural mechanization was summarized by Pellizzi (1992) cited in Ituen (2009) as minimization of production costs, optimization of product quality, protection of the environment and minimization of farm production flexibility, change in agro production and processing methods, logistics and equipment (Spore, 2002).

2.3 Empirical Review:
Isa, (2015) carried out a study to determine the Influence of Agricultural Mechanization on Crop Production in Bauchi and Yobe States of Nigeria. The population of the study comprised contact farmers from the five Agricultural Development Programme Zones in Bauchi and Yobe States. The multi-stage sampling technique was used to select three hundred and sixty-eight contact farmers. The questionnaire was used as an instrument to collect data from the respondents, with a four-point rating scale for the respondents to indicate their degrees of agreement or disagreement. The bio-data was analysed using the simple percentage while the mean average was used to answer the research questions. The answers from the research questions indicate that agricultural mechanization has a significant influence on crop production. The null hypotheses were tested using Chi square statistics. The results showed that they were all rejected because their calculated significant (p) values of 0.00 were lower than the 0.05 level of significance. The findings reveal that there was an increase in crop yields, size of farm, income of the farmers and improvements in their standards of living. The study recommended that government should provide mechanized farm tools and equipment to the farmers in the form of subsidies and also ensure that the right category of farmers benefits.

Lamidi and Akande (2013), in their study reviewed the status, challenges and prospects of Agricultural Mechanization in Osun State, Nigeria. Personal observation, oral interview, past records and the questionnaire were used to collect data from various establishments visited in the nine selected Local Government Areas (LGAs) in Osun State. Data was collected from 198 respondents and was analyzed using simple percentages (%). The study reveals that, the deprivation in abundance amongst farmers in the state and in their produce is mainly due to their inability to mechanize agriculture to improve efficiency, cost effectiveness, diversity and competitiveness. Hence, the study concluded that the low rate of adoption and utilization of appropriate mechanization technologies has remained one of the major factors militating against agricultural production in Nigeria.

2.4 Endogenous Growth Theory:
By the mid-1980s, a group of growth theorists had become increasingly dissatisfied with common accounts of exogenous factors determining long-run growth. They favoured a model that replaced the exogenous growth variable (unexplained technical progress) with a model in which the key determinants of growth were explicit. Consequently, the Endogenous (new) growth theory emerged due to some flaws in the exogenous growth theory and holds that economic growth is primarily the result of endogenous and not external forces (Romar, 1994).
The Romar endogenous growth theory which was first presented in 1986 takes knowledge as an input in the production function. The theory aims at explaining the long-run growth by endogenizing productivity growth or technical progress. The major assumptions of the theory are: Increasing returns to scale because of positive externalities; Human capital (knowledge, skills and training of individuals) and the production of new technologies are essential for long-run growth; Private investment in Research and Development is the most important source of technological progress; Knowledge or technical advances are non-rival good.

In the New growth theory, the savings rate affects the long-run economic growth because in this framework, a higher level of savings and capital formation allows for greater investments in human capital and Research and development. The model predicts that the economy can grow forever as long as it does not run out of new ideas or technological advancement. Just like the exogenous growth theory, the endogenous growth theory professes a convergence of nations by the diffusion of technology, that is, a situation where poor countries manage to catch up with the richer countries through the gradual imitation of technology by poorer countries.

3.0 The Methodology:
The choice of research design employed in this study is the archival and documentary research strategy used for descriptive research purposes (Saunders, et al., 2009). This was to allow for the collection of quantitative data to analyse the impact of agricultural equipment financing on the productivity of the sector. The population of this study comprises 16 years data on the total annual financial expenditure on agricultural equipment, agricultural productivity or output and export earnings from 2000 to 2015 (16 years). Secondary data on cumulative annual expenditure on agricultural equipment financing (AEF) and Agricultural productivity indicators were sourced from the CBN’s annual reports, statements of account and statistical bulletins, World Bank reports, Federal Ministry of Agriculture and the National Bureau of Statistics, in line with the time series-based secondary method of data collection.

3.1 Data Analysis and Model Specification:
The two hypotheses formulated in this study were tested using the F-statistics. The F-statistics is a test of the overall significance of the entire variables used in the regression model; it is used to denote whether the joint impact of the explanatory (exogenous/ independent variables) actually have a significant influence on the dependent variable. The decision rule for accepting or rejecting the null hypothesis for any of these tests was based on the Probability Value (PV). If the PV is less than 5% or 0.05 (that is PV < 0.05), it implies that the regressor in question is statistically significant at 5% level; otherwise, it is not significant at that level.

\[ TMF = f(AEF) \]  
\[ AP = f(TM) \] (1) (2)

The study conducted unit root tests using the Augmented Dickey-Fuller (ADF) to ascertain the stationary level of the data before carrying out the cointegration test. The study also investigated both the long-run effects and the short-run dynamics using the Error Correction Model (ECM) approach which gives the short-run coefficient without losing the long-run information. The lag length or order of the variables was selected by using the Akaike Information Criteria (AIC). The choice of AIC is that it gives the heaviest penalties for loss of degree of freedom and also imposes a larger penalty for additional coefficients (Ogwumike & Ofoegbu, 2012). The ECM model provided by Pesaran, Shin and Smith (2001) is given as
\[ \Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 X_{t-1} + \sum_{i=0}^{l} \beta_i \Delta Y_{t-i} + \sum_{j=0}^{l} \beta_j \Delta X_{t-j} + \epsilon_t \]

Linearizing equation (1 to 2) to obtain a steady state Error Correction Model (ECM), we have:

\[ \Delta TMF_t = \beta_0 + \sum_{i=1}^{m} \beta_i \Delta TMF_{t-i} + \sum_{j=0}^{n} \beta_j \Delta AEF_{t-j} + \delta ECT + \epsilon_t \] (7)

\[ \Delta AP_t = \beta_0 + \sum_{i=1}^{m} \beta_i \Delta AP_{t-i} + \sum_{j=0}^{n} \beta_j \Delta TMF_{t-j} + \delta ECT + \epsilon_t \] (8)

Where:
- **AEF** = Agricultural equipment financing
- **TMF** = Technological advancement of Mechanized Farming
- **AP** = Agricultural productivity (outputs)
- **\( \beta_0 \)** = the autonomous parameter estimate (Intercept or constant)
- **\( \beta_1 \) to \( \beta_{12} \)** = Parameter coefficients
- **\( \Delta \)** = First difference operator
- **\( \epsilon_t \)** = The white noise error term
- **ECT** = The error correction term
- **\( \delta \)** = The speed of adjustment parameter

### 4.0 Results and Discussions

**Table 1: Data on Agricultural Equipment Financing, Technological Advancement of Mechanized Farming & Agricultural Productivity, 2000-2015**

<table>
<thead>
<tr>
<th>Year</th>
<th>Agricultural Equipment Financing (AEF)</th>
<th>Technological Advancement of Mechanized Farming (TMF)</th>
<th>Agricultural Productivity (AP) (Constant Basic Prices) (N Billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>41.0</td>
<td>553.48</td>
<td>4,840.97</td>
</tr>
<tr>
<td>2001</td>
<td>55.8</td>
<td>570.08</td>
<td>5,024.54</td>
</tr>
<tr>
<td>2002</td>
<td>59.8</td>
<td>597.50</td>
<td>7,817.08</td>
</tr>
<tr>
<td>2003</td>
<td>62.1</td>
<td>622.56</td>
<td>8,364.83</td>
</tr>
<tr>
<td>2004</td>
<td>67.7</td>
<td>663.03</td>
<td>8,888.57</td>
</tr>
<tr>
<td>2005</td>
<td>48.6</td>
<td>707.87</td>
<td>9,516.99</td>
</tr>
<tr>
<td>2006</td>
<td>49.4</td>
<td>756.73</td>
<td>10,222.47</td>
</tr>
<tr>
<td>2007</td>
<td>149.6</td>
<td>809.16</td>
<td>10,958.47</td>
</tr>
<tr>
<td>2008</td>
<td>106.4</td>
<td>864.19</td>
<td>11,645.37</td>
</tr>
<tr>
<td>2009</td>
<td>135.7</td>
<td>920.20</td>
<td>12,330.33</td>
</tr>
<tr>
<td>2010</td>
<td>128.4</td>
<td>979.56</td>
<td>13,048.89</td>
</tr>
<tr>
<td>2011</td>
<td>255.2</td>
<td>999.40</td>
<td>13,429.38</td>
</tr>
<tr>
<td>2012</td>
<td>316.4</td>
<td>972.76</td>
<td>14,329.71</td>
</tr>
<tr>
<td>2013</td>
<td>343.7</td>
<td>1,030.94</td>
<td>14,750.52</td>
</tr>
<tr>
<td>2014</td>
<td>401.9</td>
<td>1,086.85</td>
<td>15,380.39</td>
</tr>
<tr>
<td>2015</td>
<td>467.6</td>
<td>1,151.32</td>
<td>15,952.22</td>
</tr>
</tbody>
</table>

Source: CBN Statistical Bulletin, 2015; NBS, 2016; World Bank, 2017
Federal Ministry of Agriculture, 2017
Table 2: Summary of Unit Root Test Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>ADF Test Statistic</th>
<th>Order of Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMF</td>
<td>-3.355482(-3.29230)***</td>
<td>I(1)</td>
</tr>
<tr>
<td>AEF</td>
<td>-3.296853(-3.29230)***</td>
<td>I(1)</td>
</tr>
<tr>
<td>AP</td>
<td>-9.332791(-4.440739)*</td>
<td>I(0)</td>
</tr>
</tbody>
</table>

Source: Authors Compilation (2017), E-views 9.0 Output

Table 2 above indicates that TMF and AEF were found stationary at first difference, that is, at order I(1). This means that their ADF test statistic was found greater than their respective tabulated values. However, AP was found stationary at order I(0) as also shown in Table 2. Since the variables were found stationary at different orders (mixed orders), the ARDL approach to co-integration was applied to examine the long-run relationship among the variables. The calculated F-Statistic indicates that the joint hypothesis that the lagged level variable of the coefficients is zero equals 5.027. This figure is greater than the upper bounds of the critical values of all the conventional levels 10% (3.77) and 5% (4.35). This means that the joint null hypothesis of all the lagged level variables of the coefficients being zero is rejected even at 5%. This suggests that there is cointegration of agricultural financing and productivity; hence a long-run relationship between agricultural financing, productivity and economic growth.

4.1 Test of Hypotheses:
The two hypotheses formulated in this study were tested using the F-statistics. The rule for accepting or rejecting the null hypothesis for any of these tests was based on the Probability Value (PV). If the PV is less than 5% or 0.05 (that is, PV < 0.05), it implies that the regressor in question is statistically significant at 5% level; otherwise, it is not significant at that level.

Hypothesis One:

H0: That Agricultural equipment financing has no significant impact on the technological advancement of mechanized farming in Nigeria

Table 3: Regression Result on Agricultural equipment financing and technological advancement of mechanized farming:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMF(-1)</td>
<td>1.043240</td>
<td>0.072362</td>
<td>14.41699</td>
<td>0.0000</td>
</tr>
<tr>
<td>AEF</td>
<td>-0.315938</td>
<td>0.155356</td>
<td>-2.033643</td>
<td>0.0725</td>
</tr>
<tr>
<td>AEF(-1)</td>
<td>-0.006803</td>
<td>0.164025</td>
<td>-0.041474</td>
<td>0.9678</td>
</tr>
<tr>
<td>AEF(-2)</td>
<td>0.423328</td>
<td>0.157438</td>
<td>2.688859</td>
<td>0.0248</td>
</tr>
<tr>
<td>CointEq(-1)</td>
<td>-0.043240</td>
<td>0.072362</td>
<td>0.597552</td>
<td>0.5649</td>
</tr>
<tr>
<td>C</td>
<td>10.28511</td>
<td>46.18392</td>
<td>0.222699</td>
<td>0.8287</td>
</tr>
</tbody>
</table>
By examining the overall fit and significance of the model, it could be observed that the model has better fit. This was captured by the probability F-statistic value of 0.003 which is less than 0.05. The conclusion is that Agricultural equipment financing has a significant impact on technological advancement of mechanized farming in Nigeria.

The coefficient of determination $R^2$ (R-squared), which was used to measure the goodness of fit of the estimated model, further indicates that the model is reasonably fit in prediction. That is, about 79.10 percent change in technological advancement of mechanized farming was due to agricultural equipment financing collectively, while 20.9 percent unaccounted variations were captured by the white noise error term. It shows that agricultural equipment financing has strong or significant impact on technological advancement of mechanized farming in Nigeria. The Durbin Watson (DW) statistics which is also used to test for the presence of serial correlation indicates that there is no autocorrelation among the variables as captured by (DW) statistic of 1.76, and as such, the estimates are unbiased and can further be relied upon for sound policy decisions.

**Hypothesis Two:**

$H0_2$: That There is no significant relationship between technological advancement of mechanized farming and increased agricultural productivity

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*Note: P-values and any subsequent tests do not account for model selection.

Source: Authors’ Computation, 2017 (Eview-9.0)
Table 4: Regression Result on technological advancement of mechanized farming and increased agricultural productivity
Dependent Variable: AP
Method: ARDL
Date: 06/22/17   Time: 23:41
Sample (adjusted): 2002 2015
Included observations: 14 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (2 lags, automatic): TMF
Fixed regressors: C
Number of models evaluated: 3
Selected Model: ARDL(1, 2)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP(-1)</td>
<td>0.183065</td>
<td>0.101999</td>
<td>1.794777</td>
<td>0.1063</td>
</tr>
<tr>
<td>TMF</td>
<td>6.042150</td>
<td>2.950092</td>
<td>2.048123</td>
<td>0.0708</td>
</tr>
<tr>
<td>TMF(-1)</td>
<td>-1.069964</td>
<td>4.188323</td>
<td>-0.255463</td>
<td>0.8041</td>
</tr>
<tr>
<td>TMF(-2)</td>
<td>7.334264</td>
<td>2.774144</td>
<td>2.643794</td>
<td>0.0267</td>
</tr>
<tr>
<td>CointEq(-1)</td>
<td>-0.816935</td>
<td>0.101999</td>
<td>-8.009276</td>
<td>0.0000</td>
</tr>
<tr>
<td>C</td>
<td>-284.8878</td>
<td>431.5919</td>
<td>-0.660086</td>
<td>0.5257</td>
</tr>
</tbody>
</table>

R-squared 0.895297  Mean dependent var. 11902.52
Adjusted R-squared 0.793207  S.D. dependent var. 2690.254
S.E. of regression 221.7334  Akaike info criterion 13.91328
Sum squared resid 442491.2  Schwarz criterion 14.14152
Log likelihood -92.39297  Hannan-Quinn criter. 13.89215
F-statistic 6.981681  Durbin-Watson stat. 1.936327
Prob(F-statistic) 0.001232

*Note: p-values and any subsequent tests do not account for model selection

Source: Authors’ Computation, 2017 (E-view-9.0)

From Table 4, it could be observed that overall the regression model is significant. This was captured by the probability F-statistic value of 0.0012 which is also less than 0.05. Thus, one might conclude that there is a significant relationship between technological advancement of mechanized farming and agricultural productivity in Nigeria.

The coefficient of determination $R^2$ (R-square) shows that the model has a good fit. That is, about 89.52 percent change in productivity output was due to technological advancement of mechanized farming, while 20.9 percent unaccounted variations were captured by the white noise error term. It shows that technological advancement of mechanized farming has strong significant impact on production output. The Durbin Watson (DW) statistics also indicate that there is no autocorrelation among the variables as captured by (DW) statistic of 1.93, and as such, the estimates are unbiased and can further be relied upon for sound policy decisions.

Findings from the study reveal that there is a significant relationship between technological advancement of mechanized farming and productivity. This is in agreement with Isa (2015) who found out that agricultural mechanization has a significant influence on crop production. His findings revealed that there was an increase in crop yields, size of farm, income of the farmers and improvements in their standards of living. He concluded that the influence of
agricultural mechanization on crop production was significant. However, Lamidi and Akande (2013), had a contrary result. Their study revealed that the low rate of adoption and utilization of appropriate mechanization technologies has remained one of the major factors militating against agricultural production in Nigeria. Their finding was buttressed by the results of their analysis which identified shortage of capital, land tenure, small farm holding and fragmented land, poor infrastructural facilities, poor attitudes toward adoption of new innovations and non-availability of storage means as problems.

5.0 Conclusion and Recommendations:
The study concluded that Agricultural equipment financing has a significant impact on technological advancement of mechanized farming in Nigeria. This is based on the findings that, about 79.10 percent change in technological advancement of mechanized farming was due to agricultural equipment financing collectively, while 20.9 percent unaccounted variations were captured by the white noise error term. It shows that agricultural equipment financing has a strong significant impact on technological advancement of mechanized farming in Nigeria. Also, there is a significant relationship between technological advancement of mechanized farming and productivity. That is, about 89.52 percent change in production output was due to technological advancement of mechanized farming, while 10.48 percent unaccounted variations were captured by the white noise error term. It shows that technological advancement of mechanized farming has strong significant impact on productivity.

Based on the findings of the study, the following recommendations are hereby made;

i. Since Agricultural equipment financing has been established to have a significant impact on technological advancement of mechanized farming in Nigeria, it is recommended that efforts should be made by agricultural intervention agencies and financial institutions to increase credit finance allocated to agricultural equipment, which is a sustainable measure towards technological advancement in the sector.

ii. Since it has been established that there is a significant relationship between technological advancement of mechanized farming and productivity, it is recommended that concerted efforts should be made by the government, through supporting agencies and private sector partnership to facilitate local production of needed technology as this will increase technical expertise and help boost mechanized farming and sustain an increasing level of output, processing and packaging of agricultural produce due to technological input.

References


