AGRICULTURAL CROP SUB-SECTOR PRODUCTIVITY ANALYSIS IN NIGERIA BETWEEN 1970 AND 2013

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ABSTRACT

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As a background for agricultural policy analysis, the cardinal sources of productivity gains must be identified and the impact of these factor endowments on productivity investigated. Accounting for input-output affinity is highly critical in modeling agriculture in Nigeria for policy analysis. Efforts made in the past to improve farmers’ productivity appeared to have failed and the extent by which the various factors of production endowments influenced the overall output and productivity was not known. This research effort was therefore intended to strengthen equitable distribution of real income and the nation’s aggregate economic prosperity. Time series data were collected for analysis and the composite agricultural production effort was ruptured into land, labour, capital stocks, materials and time. Isolation analysis, multiple regression analysis, Analysis of variance (ANOVA) and descriptive statistics were employed for the analysis. F-Statistics and T-Statistics were used for the hypothesis testing. Contrary to theoretical expectations, the agricultural labour and capital stock productivity in Nigeria were respectively significant in all distributions (p<0.01), hence the rejection of the null hypotheses and the conclusion that both labour and capital stock productivity were significant to support agricultural investments that were economically feasible. This suggested that agricultural labour in Nigeria were highly effective and productive within human limits. Contrary to a priori expectations, the negative impact of capital stock on partial labour productivity was statistically significant (p<0.05). This was largely attributed to capital widening, suggesting that agricultural production in Nigeria was significantly labour intensive and that the available capital stocks were gender sensitive, and discriminating technically against women who dominated the agricultural sector. The negative impact of capital-labour ratio on partial capital stock productivity was statistically significant (p<0.05). These events created imperfect capital stock adjustment that did not allow full capital-reversing. Capital stock productivity was more consistent with a coefficient of variation of 22.4% compared to labour productivity with a coefficient of variation of 50%. The results showed that increased domestic energy prices rendered agricultural capital stocks obsolete and that subsidized employment (NYS) provided cheap labour that substituted agricultural capital stock and impaired productivity. Advances in agricultural technology had a negative impact on labour productivity and the impact was statistically significant at p<0.01. Farmers health status and public inputs impact were negative and statistically significant respectively at p<0.01 and p>0.05 implying that rural farmers health status and public inputs impaired agricultural productivity.

Keywords: Labour Productivity, Capital-Stock Productivity, Capital-widening, Capital-Reversing, Factor Endowments

INTRODUCTION

The prime sources of real income per capita are productivity gains and productivity slowdown implies regressed living standards (Basu et al, 1997; Chukwu, 2012). As a background for agricultural policy analysis, the cardinal sources of productivity growth must be identified and known for prudent management and utilization (Denison, 1979; Frank and Dele, 1980; Jhingan, 2010). Further, productivity is a major component of long-run agricultural output growth, strongly tied to the quality of production factor endowments and technological progress. Hence, infinitesimal investments on physical and human capital resources degenerates productivity indices (Jonathan,2002;Mankiw,2007). Consequent to capital dilution, amplified farm household demographic statistics is significant for factor accumulation. The efficiency of an agricultural system is explained as output to input ratio either in terms of technical or economic efficiency which are synonymous with agricultural productivity (David, 2012). Nigerian farmers’ real income from various agricultural investment sources were highly volatile, infinitesimal and fast deprecating. The major problem therefore, was that majority of the farmers were vastly living in abject poverty and it was not known whether the observation should be attributed to the farmers’ poor quality production factors endowment. This study was therefore very paramount since Nigerian agriculture economy reflected inefficient use of productive factors endowment and consequently unable to create desirable farm outputs. It was therefore possible to hypothesize that agricultural labour and capital stock productivity were insignificant to support commercial agricultural investments in Nigeria (Chukwu, 2012; Kendrick, 1980; Kopcke, 1980; Miller, et al., 2012; Panneerselvan, 2010)

Experiencing a robust agricultural sector in Nigeria following the results of this study is feasible. Hence, this research effort can aid policy makers generate efficient and prudent policies that can improve agricultural labour and capital stock productivity behavior. This implies that the outcome of this study can contribute to the strengthening of the overall economic growth in Nigeria. Therefore, amplified agricultural productivity behavior suggests first, that the sector will experience increased output at less input and second, with good and effective
agricultural policies, Nigerian farm household units must modify their response behavior to agribusiness shocks and business cycles in Nigeria. The policy induced resurgence in productivity growth was expected to be followed by equitable distribution of real income, suggesting that the participants in Nigerian agricultural sector are receiving a fair share of the aggregate economic prosperity. Therefore, it was possible to suggest that the results of this research effort are of immense value to the government, policy makers, farmers, industries, research scientists and practicing agricultural experts (Michael and Stephen, 2011; Surrey, 1979; Terry and Philip, 1991; Robert, 2003).

Accounting for input-output relationship was highly critical in modeling agriculture in Nigeria for policy analysis. Therefore, the key policy question was how much of the variations in agricultural productivity can be explained by the quality of productive factors endowment (CBN, 2000c; Peterson,1989; Olayide and Earl1982; Pierre and Andre, 2009; Robert, 2003).

**METHODOLOGY**

This research demanded a retrace and analysis of the official statistics from relevant government agencies in Nigeria. The study covered the period between 1970 and 2013. The component technologies embodied in agricultural production functions were disaggregated into high quality human capital stock, high yielding biological units, efficient physical capital stock, abiotic and economic units. Therefore, agricultural production effort was a composite input ruptured into land, labour, capital stock, materials and time among others invested in the farm. Farm inputs also included natural resources such as water, air and light among others. These factors of production when combined in proper and adequate proportions interact to yield the desired outputs that are multiplied by time to estimate efforts expended in farm production (Campbell, et al., 2009; Dwiwedi, 2008; Koutsoyiannis, 2003; Ernest, 1980). Time series data on labour, capital stock, inflation, energy prices, employment subsidy, advances in technology, labour quality, land quality, farmers’ health status, and public inputs collected were first subjected to initial isolation analysis to establish their internal consistency and plausibility. Multiple regression analysis and Analysis of variance (ANOVA) were employed for the analysis while F-Statistics and T-Statistics were used to test the hypotheses. Descriptive statistics was used to further explain the results (Christopher, 1992; Kerry, 2000; CBN 2000a and b, 2010, Koutsoyiannis, 1996; McClave and Sincich, 2000; Pillai and Bagarathi, 2012; Rangaswamy and 2007; Wooldridge, 2006; Robert and John,1997).

Agricultural productivity was therefore, decomposed into partial labour and partial capital stock productivity which were implicitly expressed as Eq. (1) and Eq. (2) respectively:

$$L_{Pt} = f ( L_{1t}, K_{1t}, L_{2t}, K_{2t}, R_{nt}, E_{Pt}, S_{Pt} ) \text{ and } K_{Pt} = f ( L_{1t}, K_{1t}, L_{2t}, K_{2t}, R_{nt}, E_{Pt}, S_{Pt} )$$

and

$$L_{Pt} = f ( L_{1t}, K_{1t}, L_{2t}, K_{2t}, R_{nt}, E_{Pt}, S_{Pt} ) \text{ and } K_{Pt} = f ( L_{1t}, K_{1t}, L_{2t}, K_{2t}, R_{nt}, E_{Pt}, S_{Pt} ) + U \text{ } \ldots \text{Eq. (1)}$$

$$L_{Pt} = f ( L_{1t}, K_{1t}, L_{2t}, K_{2t}, R_{nt}, E_{Pt}, S_{Pt} ) + U \text{ and } K_{Pt} = f ( L_{1t}, K_{1t}, L_{2t}, K_{2t}, R_{nt}, E_{Pt}, S_{Pt} ) + U \text{ } \ldots \text{Eq. (2)}$$

Where $$L_{Pt}$$ and $$K_{Pt}$$ were respectively labour productivity and capital stock productivity and where $$L_{1t}, K_{1t}, L_{2t}, K_{2t}, R_{nt}, E_{Pt}, S_{Pt}$$ labour input, capital stock input, capital-labour ratio, inflation rates, domestic energy prices, employment subsidy, advances in technology, labour quality, land quality index, health status, and public inputs respectively. $$U$$ was the error term while $$F$$ was the transformation function. Equation (1) was explicitly expressed as:

$$L_{Pt} = \alpha + \beta_{1} L_{1t} + \beta_{2} K_{1t} + \beta_{3} L_{2t} + \beta_{4} K_{2t} + \beta_{5} R_{nt} + \beta_{6} E_{Pt} + \beta_{7} S_{Pt} + \beta_{8} T_{At} + \beta_{9} Q_{St} + \beta_{10} A_{Qn} + \beta_{11} H_{S1t} + \beta_{12} P_{Tt} + U$$

Eq. (3)

$$K_{Pt} = \alpha + \beta_{1} L_{1t} + \beta_{2} K_{1t} + \beta_{3} L_{2t} + \beta_{4} K_{2t} + \beta_{5} R_{nt} + \beta_{6} E_{Pt} + \beta_{7} S_{Pt} + \beta_{8} T_{At} + \beta_{9} Q_{St} + \beta_{10} A_{Qn} + \beta_{11} H_{S1t} + \beta_{12} P_{Tt} + U$$

Eq. (4)

$$\log L_{Pt} = \alpha + \beta_{1} \log L_{1t} + \beta_{2} \log K_{1t} + \beta_{3} \log L_{2t} + \beta_{4} \log K_{2t} + \beta_{5} \log R_{nt} + \beta_{6} \log E_{Pt} + \beta_{7} \log S_{Pt} + \beta_{8} \log T_{At} + \beta_{9} \log Q_{St} + \beta_{10} \log A_{Qn} + \beta_{11} \log H_{S1t} + \beta_{12} \log P_{Tt} + U$$

Eq. (5)

Where $$\beta_{1} > 0, \beta_{2} > 0, \beta_{3} > 0, \beta_{4} > 0, \beta_{5} > 0, \beta_{6} > 0, \beta_{7} > 0, \beta_{8} > 0, \beta_{9} > 0, \beta_{10} > 0 \text{ and } \beta_{11} > 0$$. Where $$\alpha$$ was the intercept while the $$\beta$$s were the parameter estimates.

Equation (2) was also expressed explicitly as:

$$K_{Pt} = \alpha + \beta_{1} L_{1t} + \beta_{2} K_{1t} + \beta_{3} L_{2t} + \beta_{4} K_{2t} + \beta_{5} R_{nt} + \beta_{6} E_{Pt} + \beta_{7} S_{Pt} + \beta_{8} T_{At} + \beta_{9} Q_{St} + \beta_{10} A_{Qn} + \beta_{11} H_{S1t} + \beta_{12} P_{Tt} + U$$

Eq. (6)

$$\log K_{Pt} = \alpha + \beta_{1} \log L_{1t} + \beta_{2} \log K_{1t} + \beta_{3} \log L_{2t} + \beta_{4} \log K_{2t} + \beta_{5} \log R_{nt} + \beta_{6} \log E_{Pt} + \beta_{7} \log S_{Pt} + \beta_{8} \log T_{At} + \beta_{9} \log Q_{St} + \beta_{10} \log A_{Qn} + \beta_{11} \log H_{S1t} + \beta_{12} \log P_{Tt} + U$$

Eq. (7)

Where $$\beta_{1} > 0, \beta_{2} > 0, \beta_{3} > 0, \beta_{4} > 0, \beta_{5} > 0, \beta_{6} > 0, \beta_{7} > 0, \beta_{8} > 0, \beta_{9} > 0, \beta_{10} > 0 \text{ and } \beta_{11} > 0$$. Where $$\alpha$$ was the intercept while the $$\beta$$s were the parameter estimates.
RESULTS AND DISCUSSION

The results obtained from the partial labour productivity analysis were as shown in Table 1.

Table 1: Goodness of fit statistics of the partial agricultural labour productivity analysis

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Lin (Eq.3)</th>
<th>Lin-log (Eq.4)</th>
<th>Log-log (Eq.5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>0.95022</td>
<td>0.97375</td>
<td>0.96471</td>
</tr>
<tr>
<td>R²</td>
<td>0.90293</td>
<td>0.94819</td>
<td>0.93066</td>
</tr>
<tr>
<td>SEE</td>
<td>0.83821</td>
<td>0.91257</td>
<td>0.88299</td>
</tr>
<tr>
<td>DW</td>
<td>2.22199</td>
<td>1.96761</td>
<td>2.05280</td>
</tr>
<tr>
<td>Observed F-value</td>
<td>13.95236*</td>
<td>26.61993*</td>
<td>19.52290*</td>
</tr>
<tr>
<td>Sig F-value</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>Regression DF</td>
<td>11</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Residual DF</td>
<td>18</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Tabular F-value (1%)</td>
<td>3.37</td>
<td>3.55</td>
<td>3.55</td>
</tr>
</tbody>
</table>

Sources: Estimates from multiple regression analysis of field data 2013. * = Significant at 1% level.

The results in Table 1, provided the direction and overall strength of the correlation between labour productivity and the combined impact of the explanatory variables. The non-negative quantity, R-square with limits 0 ≤ r² ≤ 1 for Eq. (3), Eq. (4) and Eq. (5) were compared and Eq. (4) which had the least standard error estimate (5%) and the highest explanatory power (95%) was chosen for the test of the null-hypothesis. The adjusted Rsquare of Eq. (4) showed that the R² was not magnified. Hence, Eq. (4) was the most plausible and best choice for the discussions. Eq. (4) also had the greatest number of variables that were statistically significant and agree with a priori expectation. The R² (0.94819) obtained for Eq. (4) was a statistical estimate subject to error and was therefore tested for reliability and degree of confidence using F-Statistics. The results showed that the observed F-value, 26.61993* was statistically significant at all distributions and or specifically at p<0.01 level, contrary to a priori expectations. Hence the rejection of the null hypothesis and the conclusion that agricultural labour productivity in Nigeria was statistically significant to support economically feasible agricultural production. That is, the agricultural labour in Nigeria was highly effective and productive within human limits.

At F* >F(0.01) level of significance and or 99% confidence level, rejecting the null hypothesis was a right policy decision (Gujarati, 1995; Gerald and Brain, 1997; Murray and Larry, 1999). The Durbin-Watson d-statistics test and the modified Durbin-Watson d-test for the period were conducted and the results showed that at 10% level, there were no evidence of autocorrelation existence. The Durbin-Watson statistic was calculated for this study to test multicollinearity existence. The results showed absence of any strong evidence of multicollinearity and this result fortified the independence, accuracy and stability of the parameter estimates. The results showed the results of the partial stock productivity analysis.

Table 2: Goodness of fit statistics of the partial agricultural capital stock productivity analysis

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Lin (Eq.6)</th>
<th>Lin-log (Eq.7)</th>
<th>Log-log (Eq.8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>0.98786</td>
<td>0.97223</td>
<td>0.98652</td>
</tr>
<tr>
<td>R²</td>
<td>0.97587</td>
<td>0.94525</td>
<td>0.97322</td>
</tr>
<tr>
<td>SEE</td>
<td>0.95979</td>
<td>0.90758</td>
<td>0.95481</td>
</tr>
<tr>
<td>DW</td>
<td>2.44003</td>
<td>2.36434</td>
<td>1.65782</td>
</tr>
<tr>
<td>Observed F-value</td>
<td>60.66958*</td>
<td>25.10388*</td>
<td>52.85874*</td>
</tr>
<tr>
<td>Sig F-value</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0000</td>
</tr>
<tr>
<td>Regression DF</td>
<td>11</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Residual DF</td>
<td>18</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Tabular F-value (1%)</td>
<td>3.37</td>
<td>3.55</td>
<td>3.55</td>
</tr>
</tbody>
</table>

Sources: Estimates from multiple regression analysis of field data 2013. * = Significant at 1% level.

As shown in Table 2, expounding the variations in capital stock productivity, the performance of Eq. (6) and Eq. (8) were about the same and better compared to Eq. (7). However, while the parameters in Eq. (6) were in absolute values, Eq. (8) parameters were in constant elasticity. Hence, on the basis of this advantage, in addition
to having the greatest number of variables that were significant and in consonance with a priori expectations, Eq. (8) was chosen for the testing of the null hypothesis and subsequent discussions of the results. The combined impact of the independent variables on capital stock productivity was positive and statistically significant at F* > F(0.01) level. Hence the rejection of the null hypothesis and the acceptance of the alternative hypothesis that the capital stock productivity was significant to support commercial agricultural production in Nigeria. The results further showed that there were neither the incidence of autocorrelation nor multicollinearity. Eq. (4) and Eq. (8) showed the parameter estimates respectively for discussions on agricultural labour and capital stock productivity analysis.

\[ LP_t = \log-0.07** + 0.011\log L_{1,t}** -3.3E-05\log K_{2,t}** + 4.9E-05\log KL_{3,t} -3.7E-05\log R_{4,t} + 1.5E-04\log EP_{5,t} + (0.02) (0.003) (0.0001) (0.002) (2.05E-04) (3.5E-04) \]

\[ 1.8E-04\log ES_{6,t} - 5.6E-04\log AT_{7,t}** + 0.0011\log LQ_{8,t} + 6.2E-05\log AQ_{9,t} - 6E-04\log HS_{10,t}** + 1.1E-04\log PT_{11,t} \] ... Eq.(4).

\[ R^2 = 0.94819 (95%), R^2 = 0.91257 (91%), SEE = 4.57603E-04 (5%), DW = 1.96761, F-Value = 26.61993*, * = Significant at 1%, * = Significant at 5%, *** = significant at 10% and where \( \beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 < 0, \beta_5 < 0, \beta_6 > 0, \beta_7 > 0, \beta_8 > 0, \beta_9 = 0, \beta_{10} > 0 \) and \( \beta_{11} > 0 \).

\[ \log KP_t = \log 7.5 - 0.12\log L_{1,t}** + 1.8\log K_{2,t}** - 2.4\log KL_{3,t}** + 0.14\log R_{4,t} - 0.05\log EP_{5,t}** - 0.42\log ES_{6,t} + 0.03\log AT_{7,t} + 0.98\log LQ_{8,t} - 0.02\log HS_{10,t} - 0.05\log PT_{11,t}** \] ... Eq.(8)

\[ R^2 = 0.97322 (97%), R^2 = 0.95481 (95%), SEE = 0.29853 (2.68%), DW = 1.65782, F-Value = 52.85874*, * = Significant at 1%, ** = Significant at 5%, *** = significant at 10% and where \( \beta_1 > 0, \beta_2 > 0, \beta_3 > 0, \beta_4 < 0, \beta_5 < 0, \beta_6 > 0, \beta_7 > 0, \beta_8 > 0, \beta_9 = 0, \beta_{10} > 0, \beta_{11} > 0 \).

The intercept of Eq. (8) was positive which implied growth, contrary to that of Eq. (4) which did not make economic sense. The impact of the increased number of economically active workforce (L1) on partial labour productivity was positive and statistically significant at p<0.05 level, contrary to its negative impact on partial capital stock productivity at p<0.05 significant level. However, capital stock (K2) input made a significant (p<0.1) impact on partial capital assets productivity but its significant (p<0.05) negative impact on partial labour productivity was contrary to a priori expectations. This was largely attributed to capital widening and which further implied that Nigerian agricultural economy accumulated capital stock assets at infinitesimal rate compared to labour workforce growth rate in agriculture. This therefore suggested that Nigerian agricultural economy was predominantly labour intensive. This observation further suggested that the imported capital stocks employed in Nigeria’s domestic farms were expensive and or gender sensitive. Hence it was possible to conclude that the capital stock inputs available discriminated technically against women who dominated Nigerian agriculture. There is need therefore, to generate appropriate technologies that are not gender sensitive for applications in Nigeria.

The positive impact of capital-labour ratio (KL3) on partial capital stock productivity was statistically significant at p<0.05 level. The positive impact of capital-labour ratio (KL3) on partial labour productivity was statistically insignificant. These observed events appeared to have created imperfect capital stock adjustments that did not allow capital-reversing to take place fully. Thus, adoption of improved farm mechanization techniques for higher profit rate generation was not easily attainable during the studied period in Nigeria. Consequently, capital asset inputs (KL3) in Nigerian agricultural economy did not contribute any significant economic value to gross domestic product (GDP). This appeared to confirm the earlier observation that agricultural production in Nigeria is dominantly labour intensive (Chukwu, 2012 and Okeke, 1995). The observed capital-labour ratio behavior suggested that there were inadequate employment of effective capital stocks in on-farm activities in Nigeria. However, capital stock inputs remained a better and more consistent technological options compared to manual labour inputs as shown in Table 3.

### Table 3: Descriptive statistics of labour and capital stock productivity

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Mean output per input (t)</th>
<th>Standard deviation (( \delta ))</th>
<th>Coefficient of variation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labour productivity</td>
<td>0.004</td>
<td>0.002</td>
<td>50</td>
</tr>
<tr>
<td>Capital Stock productivity</td>
<td>6.275</td>
<td>1.404</td>
<td>22.4</td>
</tr>
</tbody>
</table>

Sources: Field data analysis 2013.

The negative domestic energy price (EP3) impact on capital stock productivity was homogeneous with a priori expectations. This implied that energy intensive agricultural capital stocks were rendered obsolete as domestic energy price thrived. The results also showed that inflation rates (R4) eroded the real income and morale of the participants in Nigeria’s agricultural sector. However, the impact of inflation was not statistically significant. Employment subsidy (ES6) was respectively positively and negatively correlated with labour and capital stock productivity. The results suggested that subsidized employment programmes such as the National Youth Service
Corps (NYSC) provided abundant cheap labour that substituted capital stock in on-farm activities. This consequently, retarded investments on agricultural capital assets but its impact was insignificant. Advances in agricultural technology (AT\_i) were appreciable sources of productivity gains and an embodiment of technological knowledge, skill and experience required to transform inputs into farm outputs. The negative impact of advances in technology on agricultural labour productivity was consistent and statistically significant (p<0.05), suggesting gross inadequacies in skill, knowledge and experience embodied in the agricultural labour and entrepreneurs. These results therefore, showed that labour quality (LQ\_i) which is synonymous to quality of education received did not interact effectively with technological advancements in agricultural production. Hence the impact of labour quality on both labour and capital stock productivity were respectively positive, consistent and statistically insignificant. Land quality index (AQ\_i) did not favour farm mechanization given its negative correlation with partial capital stock productivity. The impact of land quality index was not statistically significant but its positive correlation with partial labour productivity suggested that it favoured labour intensive agriculture. Health status (HS\_i) impact on labour productivity was statistically significant (p<0.01) and the impact was consistently negatively correlated with partial labour productivity. This was attributed to the biodynamics that constrained vitality, causing quality of life to deteriorate through illness and greater energy dissipation in manual farm works. Public inputs (PT\_i) correlated with partial labour and capital stock productivity positively and negatively respectively. The negative impact of public inputs (PT\_i) on capital stock productivity was statistically significant (p<0.05). This implied that public inputs impact on capital stock productivity was very hostile and antagonistic. This was attributed to the poor state of public infrastructures, agricultural facilities and services required to enhance agricultural production.

CONCLUSION

The agricultural labour in Nigeria was highly effective within human limits and the available capital stock assets were significant to support commercial agricultural production that was economically feasible. The negative impact of capital stock assets on labour productivity created capital widening. This suggested that the Nigerian agricultural economy accumulated capital stock assets at a lower rate compared to the rate labour workforce employment grew in the sector. The results further showed that Nigerian agricultural economy was predominantly labour intensive and that the available capital stock was gender sensitive. Productivity response to capital-labour ratio created imperfect capital stock adjustment that did not allow full capital reversing. Thus, the adoption of improved farm mechanization techniques for higher productivity was not attainable. Consistent increase in domestic energy prices rendered the energy intensive agricultural capital stocks obsolete while inflation eroded the real income and morale of the participants in Nigeria’s agricultural sector. Subsidized employments and poor health status of the rural farmers respectively impaired agricultural productivity gains. In conclusion therefore, the observed overall results suggested that Nigerian agricultural economy was professionally specific and educational quality sensitive. Hence, quality education and adequate training in agriculture were urgently required to enhance productivity in agriculture and to strengthen farm outputs in Nigeria.

REFERENCES


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Chukwu, 2014
Frank, M. G. and Dele, W. J. 1980. USA productivity growth by industry, P17-136; New development in Productivity measurements and analysis, Chicago, University of Chicago Press.


Kendrick, J. W., 1980. Survey of factors contributing to the decline in USA productivity growth, P1-21; The decline in productivity growth, Boston USA, Federal Reserve Bank of Boston.


