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Institutions and Agricultural Productivity in Low and Middle-income African Countries

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Abstract: The study examines the impact of institutions on agricultural productivity across 45 countries in Africa. Panel data series for the 45 countries sought from World Bank Development Indicators (WDI), Food and Agricultural Organisation (FAO) and Country Policy and Institutional Assessment (CPIA) were used for the analysis. The other socioeconomic variables considered in this study are agricultural land, investment in agriculture, agricultural employment, and technology. The study estimated the pooled ordinary least squares, fixed effect model, random effect model and system generalised method of moments (GMM). The Hausman test was used to select between the fixed effect and random effect models. At a 5% significance level, the fixed effect model was preferred. Principal Component Analysis was used to generate institution index from six indicators of institutions engaged in the study. The result showed that institution has a significant positive impact on agricultural productivity. The study concluded that the quality of institutions is crucial for advancing agricultural productivity in these countries. It would prevent embezzlement and the existence of poor policies that halt agricultural productivity and the outflow of investment in the sector. In conclusion, in order to constantly promote agricultural productivity, the quality of institutions should be strengthened in these countries. Hence, ways to do so must be addressed by the relevant stakeholders. This includes increased checks and balances to have better control of corruption and improved index for voice and accountability. The study used a panel data and therefore, do not account for the effect of institutions at the country level.
Keywords: Institutions; Agricultural Sector Performance; Agricultural Labour Productivity

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1. Introduction

Western countries have gained riches and wealth in previous decades and centuries, leaving poor and developing countries behind (Zoega, 2015). Moreover, for several years, agriculture in the global economy has experienced a massive reduction in total output and productivity compared to other sectors that exhibit fast growth rates (Xu, 2012). In Africa, the agricultural sector is the largest, accounting for about 15% of the aggregate GDP in the region. It is estimated that over 70% of the population of Africa, equivalent to 1.35 billion people, are engaged in Agriculture (Alhassan, 2021; Block, 2014; Dawuni et al., 2021). Therefore, increasing agricultural productivity through effective policies (Bradfield, Butler &, Hennessy, 2022; Ebere *et al*., 2021; Bradfield, Butler, & Hennessy, 2021) is crucial for food security and Sustainable Development Goals (SDGs), especially SDG-1 & 2, to end extreme poverty and hunger by 2030.

On the other hand, there exists a negative relationship between agricultural productivity, poverty, and food insecurity (Dawuni et al., 2021; Aderemi *et al.*, 2021; Osabohien, Osabuohien & Urhie, 2018; Aderemi *et al*., 2020). An estimate by Thirtle, Piesse, Lusigi and Suhariyanto (2003) explains that a percentage increase in agricultural productivity reduced poverty by 0.72% in sub-Saharan Africa (SSA). Moreover, studies have shown that low agricultural productivity might result from inadequate human and physical capital, insufficient technological progress for commercial agriculture, and poor quality of institutions. A significant limitation of the traditional approach of determining the various sources of productivity increases is the failure to establish the problems experienced in productivity in a flexible institutional context (Djoumessi, 2021, North, 1991).

North (1990) defines institutions as constraints that govern human life and interaction. As constraints, institutions are viewed as policies on what can be done and what cannot. From North (1990)'s definition, it can be ascertained that there are different types of institutions, i.e., one for each aspect of human life- economic, legal, social, political, etc. The role of institutions in every area of the economy has been brought out to the light in most recent literature such as Bradfield et al., (2021) among others. Productivity increases are caused by technological advancements and institutions (Djoumessi; 2021; North, 1991). Institutions are government infrastructure in an economy (Lio & Liu, 2008). Therefore, the dimensions of these institutions determine the quality of the policies implemented (Bradfield et al., 2021). These dimensions include government effectiveness, control of corruption, the rule of law, voice and accountability, political stability, and regulatory quality (Kaufman, Kraay & Mastruzzi, 2005).

These indicators work hand-in-hand in determining the level of agricultural productivity. For instance, with the low implementation of the rule of law, regulatory quality is impeded, low levels of political stability, and corruption levels will rise. The level of corruption is inversely related to government effectiveness, as embezzlement

and other forms of corruption will hamper the government's performance. This may mean that government will result in a lack of transparency and non-accountability. These dimensions or indicators measure the quality of institutions in economies. The quality of governmental policies is the main reason for the difference in agricultural productivity in Africa and other parts of the world. Hence, through qualitative governance, accountability, and institutional framework, there will be an increase in agricultural productivity (Tochukwu *et al.*, 2021; Osabohien, Osabuohien & Urhie, 2018).

There has been literature on agricultural productivity recently, such as Alhassan (2021), Bradfield, Dawuni et al., (2021) and Djoumessi et al., (2021); however, irrespective of the importance of the sector in promoting economic growth and development, and the rise in literature, agricultural productivity has been on the decline for in recent years, especially in SSA. Tittonel and Giller (2013) posit that the sub-region has the lowest labour and land productivity in the world. In 2017, the proportion of agricultural value added to the Gross Domestic Product fell from 18.8% in 1981 to 15.8%, irrespective of the 30.79% rise in the absolute value- from $63 billion in 1981 to $302 billion (Omoju, Oladunjoye, Olanrele & Lawal, 2020).

Agricultural productivity also differs among the countries in the region. This suggests differences in agricultural development policies, the structure of government, and the level of infrastructural development in the region. Africa as a region can gain experience from countries that have high rates of agricultural productivity. The low level of agricultural productivity constitutes many problems, especially in developing regions like Africa. This has a ripple effect from food insecurity to increases in prices. It is of high priority that ways to increase productivity levels are considered. In recent years, researchers have explained how various factors can improve agricultural productivity. Most of these studies concluded that the main difference in productivity among various regions results from institutional heterogeneities.

Despite the increase in literature on the role of institutions on agricultural productivity, most of these studies concentrated on a specific country as a case study over time, and little panel data analysis has been presented in general literature. Moreover, existing literature did not account for the fact that countries of the same income group may have the same quality of institutions. This study examined the quality of institutions in countries in the same income classification and its relation to agricultural productivity. Also, this study explored the impact of other variables such as agricultural land, agricultural employment, investment in agriculture, social protection and technology on agricultural productivity for 45 low and middle-income countries in Africa.

2. Empirical Literature Review

Over the years, the role of institutions on agricultural productivity has attracted several empirical evidence with varied data types - majorly cross-sectional and time-series analyses. Some of the experiments in previous research have been made in single countries and others in several countries. This section of this research consists of varied empirical methods, structured methodologies as well as the results made by previous researchers on the topic. Lio and Liu (2008) explain the effects of governance on agricultural productivity in 127 countries. The study examines panel data for three years, 1998, 2000, and 2002. Two methods were used in the research's analysis. The first is the Cobb-Douglas Production Function, and the results are similar to theoretical expectations- there exists a positive relationship between governance and agricultural productivity. The second methodology employed was the structural equation model.

Yu and Nin-Pratt (2011) studied the relationship between macroeconomic policies and agricultural productivity in sub-Saharan Africa. The period was for 45 years (1984-2006). The Malmquist index used to measure productivity was used. The results show a decline in agricultural productivity that was offset by the improved efficiency of policy interventions. The study recommends that land reform policies should be adopted with high effectiveness to increase agricultural productivity and foster the growth of rural communities. Gilberto (2012) examined the impact of government effectiveness to provide agricultural infrastructure productivity in Philippine countries. The Random-effect GLS regression was applied and the result shows a significant relationship and impact of access to infrastructure on agricultural productivity.

Xu (2012) provided an empirical and theoretical study of agricultural productivity in the nine agricultural sections of the USA and the 27 provinces in China. Data for the USA was from the 1960-1996 time period, while data for China was from 1980-2006. The study adopts the Distance function and Malmquist Productivity Index for measuring productivity for both countries. From the results, the annual growth rate of agricultural productivity in both countries was similar, as they both ranged from 5-17%. This was, however, attributed to the increase in technological advancement, where China was more superior, and little attention was paid to institutions.

Kibonge (2013) examined the relationship between institutions and agricultural productivity in sub-Saharan Africa. The role of political variables and climatic factors were analysed. An output distance function was employed and showed the negative effects of climate change on total factor productivity. This was then said to be a result of the poor quality of institutions. However, there was a 0.6% annual Total Factor growth rate in agricultural productivity due directly to institutions. In a similar study, Abro, Alemu and Hanjra (2014) examined how agricultural policies and institutions affect agricultural productivity and how it then impacts the dynamics of household

poverty in rural Ethiopia. The study used a stochastic production frontier and found that input elasticity insinuates that increasing inputs may increase productivity in the short run. The study also used a fixed-effect model and estimated that agricultural policies increase agricultural productivity, leading to a summed 26.39% increase in consumption per capita in households. This finding is in line with the study by Roessali et al., (2021), which shows that strategy for developing the agricultural sector should focus on institutional factors.

Zoega (2015) examined the effects of institutions on aggregate productivity in 'convergence clubs'- high-income countries. From the methodology employed, Zoega explained that there might be problems in measuring the effects of institutional quality on productivity. The most significant problem mentioned was that there might be multicollinearity because the variables are highly correlated. This means there will be difficulties in measuring the effects of each indicator of institutions on agricultural production. However, the results show that even the smallest number of high-quality institutions can lead to increased productivity.

Álvarez, Barbero, Rodríguez-Pose and Zofío (2017) studied the relationship between institutional quality and trade in 186 countries for the period 1995-2012. The study employed the Poisson Pseudo-Maximum Likelihood estimation method and indicates that institutional conditions and institutions' distance are significant factors for international trade. Also, the factors affecting the quality of institutions are constantly increasing and are never constant. Also, the study posits that this could also be the case for economic growth and productivity. The study recommends that for greater economic dynamism, the quality of institutional policies must be made better and more effective.

Osabohien *et al*. (2018) studied the role of technology and institutional framework on food security in Nigeria. The study adopted three empirical methodologies – the Auto Regression Distributive Lag (ARDL), the Vector Error Correction (VEC), and Co-integration techniques. These were adopted to evaluate and analyse a long-run relationship between specific variables. These methods showed a high level of food insecurity that was attributed to a lack of diversification from the oil sector. This was explained in the research to be due to inadequate institutional reforms. In another study, Osabohien, Osabuohien and Ohalete (2019) explained how the institutional framework affects the long-run performance of the agricultural sector in Nigeria. The research employs the Auto Regressive Distributed Lag (ARDL). The research shows that key variables of institutions like the rule of law and political stability increase productivity and food security by approximately 29% and 69%.

Naab, Abubakari and Ahmed (2019) examined how institutions help address the issue of climate change to increase agricultural productivity in Ghana. The study concludes that institutional problems need to be addressed before their 'indirect' role on agricultural productivity is achieved.

Osabohien, Ufua, Moses and Osabuohien (2020) examined the relationship between food security and agricultural productivity and government accountability in Nigeria's agricultural sector. Results from the model suggest that government effectiveness in agricultural governance promotes agricultural performance, promoting food security in the country. Egbetokun *et al*. (2020) studied feasible institutional quality in North and Southern Africa. The cross-sectional study employed the Generalised Method of Moments to analyse the role of institutions in the sub-regions. Also, Environmental Kuznets Curve (EKC) model was adopted as well. The results indicated that North Africa attained a slower EKC than Southern Africa. As a result, recommendations from the study suggest that institutional quality in both sub-regions should be strengthened, especially in Southern Africa. On the contrary, Alhassan (2021) shows that agricultural productivity initially reduces carbon dioxide emissions to a certain point, beyond which higher agricultural productivity increases carbon dioxide emissions, contradicting the Borlaug hypothesis.

3. Methodology

This study focuses on all low and middle-income countries in Africa. These countries are Algeria, Angola, Benin, Burkina Faso, Burundi, Cameroon, Cape Verde, Central Africa Republic, Chad, Comoros, Congo, Cote d'Ivoire, Democratic Republic of Congo, Djibouti, Egypt, Eritrea, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Morocco, Mozambique, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Sierra Leone, Somalia, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, and Zimbabwe.

A sample of 45 low- and middle-income countries in Africa was selected based on data availability. Therefore, the baseline model for the study is specified implicitly as;

$$AGRP_{it} = f(LND_{it}, AE_{it}, AI_{it}, INS_{it}, TEC_{it}) \quad (1)$$

Equation 1 can be expressed explicitly as:

$$lAGRP_{it} = \alpha + \sigma lLND_{it} + \varphi lAE_{it} + \lambda lAI_{it} + \Phi INS_{it} + \theta lTEC_{it} + v_i + d_t + e_{it} \quad (2)$$

Where: AGRP means agricultural productivity, LND is arable land, AE is agricultural employment, AI is an agricultural investment, INS is Institutions, TEC is technology, v_i is country-specific effect; d_t is time-specific effect, e_{it} is error term that incorporates other variables not included in the model. Furthermore, as shown in equation (2), α is the model's constant, while $\sigma, \varphi, \lambda, \Phi, \Omega$ and θ are the coefficients of the model's independent variables. Also, while the subscript i denotes a sample of the lower-middle income countries (where i = 1...45), t denotes the observation period, 2005-2019.

To control for endogeneity, the study engages the Generalised Method of Moments (GMM), shown in equation (3)

$$lAGRP_{it} = \alpha + lAGRP_{it-1} + \sigma lLND_{it} + \varphi lAE_{it} + \lambda lAI_{it} + \Phi INS_{it} + \theta lTEC_{it} + v_i + d_t + e_{it} \quad (3)$$

Where all variables remain as previously defined, $lAGRP_{it-1}$ is the first leg of agricultural productivity. The variables used for the analysis were gotten from the World Development Indicators as presented in Table 1.

Table 1. Variable Measurement

Variable	Label	Measurement	Source
Agricultural Productivity	AGRP	Agricultural output per worker	WDI
Agricultural Land	AND	Arable land (hectares)	WDI
Agricultural Employment	AE	percentage of total employment	WDI
Agricultural Investment	AI	Investment in Agriculture ($)	FAO
Social protection	SP	policies for social coverage (scale: 1=low to 6=high)	CPIA
Institutions	INS	PCA Index of the six institutional dimensions	Authors
Technology	TEC	Individuals using the Internet (% of the population)	WDI

Note: WDI means World Development Indicators, CPIA means country policy and institutional assessment, FAO means food and agricultural organisation.
Source: Authors'

4. Result and Discussion

4.1. Descriptive Statistics

The features of the variable have been examined through the descriptive analysis, which shows the summary statistics of the variables and their measures. This sub-section indicates the statistical analysis of the variables used in the study- agricultural productivity, agricultural employment, investment in agriculture, technology, and institutions. It also presents the mean value, which is the sum of all values in the group data divided by the number of observations, the median is the middle value of each variable in the data set, the standard deviation is the square root of the variance; the minimum value is the lowest number in the set of data; the maximum value is the highest number in the set of data, and the range is the difference between the maximum and minimum values.

Table 2. Summary Statistics

Variables	Mean	Standard Deviation	Minimum	Maximum
Agricultural Productivity	6.67e+09	1.42e+10	1.23e+07	1.14e+11
Agricultural Land	4551632	6092543	0	3.70e+07
Employment in Agriculture	54.08192	20.012	8.344	92.105
Investment in Agriculture	3.90e+08	7.10e+08	719909	4.88e+09
Social Protection	2.97579	0.56348	1	4.5
Institutions	0.001082	1.0003	-1.7353	1.6711
Technology	10.9697	13.213	.215391	64.803

Source: Authors'

The mean value for Agricultural Productivity is about 6.67 billion units of production from 580 observations. This means that low- and middle-income countries in Africa produced this amount on average during the time period. The minimum and maximum values are at about 12.3 million and 114 billion units of production, respectively. This means that for the panel series, the least amount of productivity experienced from a country was over 12 million units, and the highest amount noticed was over 114 billion production units.

The mean value for agricultural land is about 4.5 million hectares from 530 observations. This means that low- and middle-income countries in Africa used this number of hectares on average during the period. The minimum and maximum values are 0 and 37 billion hectares, respectively. This means that for the panel series, the least number of hectares used in a country was 0 and the highest number of hectares used was over 37 billion hectares. The mean percentage for employment in agriculture is 54%. This means that low- and middle-income countries in Africa employed more than half of the population on average during the time period. The minimum and maximum values are 8% and 92%, respectively. This means that for the panel series, the least amount of employment in agriculture experienced from a country was at about 8%, and the highest percentage of employability in agriculture noticed was about 92%.

The mean value for investment in agriculture is about $390 million from 465 observations. This means that low- and middle-income countries in Africa invested this amount in agriculture on average during the period. The minimum and maximum values are at about $719,000 and $3.9 billion, respectively. This means that for the panel series, the least amount of investment experienced from a country was over $719,000, and the highest amount invested was over $3.9 billion. The mean index for social protection is about 2.98. This means that low- and middle-income countries in Africa had insufficient social protection of their citizens on average during the period. The minimum and maximum indexes are 1 and 4.5, respectively. This means that for the panel series, the minor social protection index from a country was 1, and the highest index noticed was 4.5.

The mean index for institutions is about 0.001 from 675 observations. This means that low- and middle-income countries in Africa had slightly high institutional quality on average during the time period. The minimum and maximum indexes are at about -1.73 and 1.67, respectively. This means that for the panel series, the least institutional quality index from a country was over -1.73, and the highest index noticed was over 1.67. The mean percentage for technology is about 11%. This means that low- and middle-income countries in Africa had, on average, low access to technology during the time period. The minimum and maximum percentages are at about 0.2% and 64%, respectively. This means that for the panel series, the least access to technology experienced in a country was about 0.2% and the highest was about 64%.

4.2. Econometric Result

The econometric result from the pooled, fixed effects and random effects regression model for the sampled 45 countries between 2009 and 2015 are shown in Table 3. The table contains the estimated parameters and the probability values (in parenthesis). The Hausman test was conducted to decide between the fixed effects and the random effects.

Table 3. POLS, Fixed Effects, Random Effects and GMM Result

Variables	Pooled OLS	Fixed effects	Random Effects	System-GMM
	1	2	3	4
Agricultural Productivity (-1)				0.4591* (0.000)
Agricultural land	0.8791* (0.000)	0.7781* (0.000)	40845 (0.000)*	0.2143* (0.000)
Employment in Agriculture	-0.0453** (0.006)	-0.0383 (0.686)	-0.0792 (0.351)	-0.1718* (0.000)
Investment in Agriculture	0.7816* (0.001)	0.5916* (0.000)	0.5811* (0.000)	0.4093* (0.000)
Technology	0.675* (0.000)	0.4442* (0.000)	0.06126* (0.001)	-0.03848* (0.000)
Social Protections	4.6788* (0.000)	6.0631** (0.026)	0.0634** (0.022)	0.1688* (0.000)
Institutions	-0.0786 (0.456)	-0.01187 (0.297)	-0.0126 (0.271)	0.0511* (0.000)
Constant	-9.8768 (0.876)	-7.8572 (0.657)	4.8734 (0.000)*	1.0447* (0.000)
R.sq.	0.98	0.91	0.93	
F-statistics	308.67 (0.000)*	295.65 (0.000)*	-	
Group/observation		38/424	381424	38/389

	38/424			
Wald Chi2	-	-	1877.32* (0.000)	10345.2 (0.000)*
AR(1)				-4.11 (0.005)*
AR(2)				-0.22 (0.828)
Hansen Tests				1.50 (0.472)
Hausman Test Chi2= 0.0066 Prob > Chi2 = 0.2039				

*Note: The p-values are in the parentis ( ), *, **, and ***, means that the elasticity is significant at 1%, 5% and 10% level respectively.*

Based on the probability value of the Hausman test, the random effect model was chosen to be the most appropriate estimator. The model has a goodness-of-fit which an R.sq of 91% represents. The R.sq. indicates that all the independent variables (agricultural land, agricultural employment, investment in agriculture, technology, social protection and institutions) account for 91% of the variations in agricultural productivity. The F-statistics = 295.65, with p = 0.000 indicates that variables in the model are jointly significant.

The elasticity of agricultural land is statistically significant at 1% level. There exists a positive relationship between agricultural land and agricultural productivity. This means a 1% increase in Agricultural Land, holding other variables constant, will result in a 0.7781% increase in Agricultural Productivity, i.e. if agricultural land increases by a single hectare, agricultural productivity will grow by 0.7781%. The coefficient of investment in agriculture is statistically significant at 1% level. There exists a positive relationship between the variable and agricultural productivity. This means that a 1% increase in Investment in Agriculture, holding other variables constant, will increase agricultural productivity by 0.5916 %.

The elasticity of technology is statistically significant at 1% level. There exists a positive relationship between the variable and agricultural productivity. This means a % increase in technology, holding other variables constant, will result in a 0.442% increase in agricultural productivity. The elasticity of social protection is statistically significant at 5% level. There exists a positive relationship between the variable and agricultural productivity. This means a 1% increase in Social Protection, holding other variables constant, will result in a 0.0631% increase in Agricultural Productivity.

To control for issues of endogeneity, the Generalised system Methods of Moments (GMM) is estimated. One of the problems may be that it consists of disturbance autocorrelation in the time series regression analysis**.** Another challenge is that the regressors may be correlated with either past or present values of the disturbances. In the literature, it is accepted that variables that are not significant in the linear static panel model may be due to problems of endogeneity**.** The study, therefore, addresses

this challenge by estimating a two-step system GMM. System GMM is a combination of levels and different dynamic equations that improve on the difference GMM. This is because it supplements the equation in the first difference with the equation in levels and accounts for the correction of measurement errors in the regressors. The preconditions for GMM are that autocorrelation at the first-order autoregressive AR (1) should be statistically significant, while autocorrelation at the second-order AR (2) should be insignificant. The Hasen J test is statistically insignificant; hence the instruments are not correlated with the residuals, and hence they are valid. Therefore, the regressors in the model properly account for more than 75% of the differences in Agricultural Productivity. Also, the Wald chi2 test has a p-value less than 0.05, which implies that all the variables are jointly significant in the model.

On average, the elasticity of the lagged dependent variable is statistically significant at 1% level. There exists a positive relationship between one-time value of Agricultural Productivity and its current estimates. This means a 1% increase in agricultural productivity in the previous year, holding other regressors constant, will result in a 0.51% increase in Agricultural Productivity in the current period at 1% significant level. Hence, agricultural productivity in the previous year exhibits an inelastic relationship with the current value of agricultural productivity.

On average, the elasticity of agricultural land is statistically significant at 1% level. There exists a positive relationship between the variable and agricultural productivity. This means a 1% increase in agricultural land, holding other regressors constant, will result in a 0.12% increase in agricultural productivity in the short run at a 1% significant level. Hence agricultural land and agricultural productivity exhibit an inelastic relationship. This is according to *apriori* expectation. This is self-explanatory, as increasing the number of hectares used for agriculture will increase agricultural productivity in these African countries.

On average, the elasticity of employment in agriculture is statistically significant at 1% level. There exists a negative relationship between the variable and Agricultural Productivity. This means a 1% increase in employment in agriculture, holding other regressors constant, will result in a 0.10% decrease in agricultural productivity in the short run at 1% significant level. On average, the elasticity of investment in agriculture is statistically significant at 1% level. There exists a positive relationship between the variable and Agricultural Productivity. This means a 1% increase in investment in agriculture, holding other regressors constant, will result in a 0.38% increase in agricultural productivity in the short run at 1% significant level.

On average, the elasticity of technology is statistically significant at 1% level. There exists a negative relationship between the variable and Agricultural Productivity. This means a 1% increase in technology, holding other regressors constant, will result in a 0.04% decrease in agricultural productivity in the short run at 1% significant level. This is not according to '*a prior* expectation. This could be a result of a lack of

technical know-how in these African countries. It is not enough to have technology; knowledge of how to use it is essential for productivity as well. This, as explained before, is a result of poor technological advancement in these countries, according to Lewis (1954). Large agricultural labour cannot increase productivity without technological advancement in these African Countries.

The elasticity of social protection is statistically significant at 1% level. There exists a positive relationship between the variable and agricultural productivity. This means a 1% increase in social protection, holding other regressors constant, will result in a 0.17% increase in agricultural productivity in the short run at 1% significant level.

The elasticity of institutions is statistically significant at 1% level. There exists a positive relationship between the variable and agricultural productivity. This means a percentage increase in Institutions, holding other regressors constant, will result in a 0.05% increase in agricultural productivity in the short run at 1% significant level. This implies that for low and middle-income countries in Africa, institutional quality is necessary and for agricultural productivity, which it has a positive relationship with, as expected from the *apriori* expectations. This means that increasing the quality of institutions in these African countries will boost agricultural productivity. The results are supported by the findings from previous studies. Although in different countries and regions, the findings still align. The results of Ahearn et al. (2002), Bharati & Fulginiti (2007), Glaeser et al. (2004), Kherallah & Kirsten (2002), Kibonge (2013), Fulginiti et al (2004) and Lawry et al. (2017) show that institutional quality has a positive relationship with Agricultural Productivity.

5. Conclusion

This study has extensively covered the relationship between institutional quality and agricultural productivity in Africa's low- and middle-income countries. It was discovered that institutional quality has a significant positive impact on agricultural productivity in these countries. However, employment in agriculture and technology showed a negative relationship, though they were significant. This was explained to be a result of poor technological advancement and inadequate technical know-how. The quality of institutions is crucial for the advancement of agricultural productivity in these countries as it would prevent embezzlement and the existence of poor policies that cause halts in agricultural productivity and outflow of investment in the sector.

In conclusion, in order to constantly promote agricultural productivity, the quality of institutions should be strengthened in these countries. Hence, ways to do so must be addressed by the relevant stakeholders. This includes increased checks and balances to have better control of corruption and improved index for voice and accountability, impositions and enforcement of sanctions to ensure adherence to the rule of law, settling political unrest and violence using proven conflict resolution strategies,

provision of social safety nets and promotion of improvement of regulatory quality of government. All these will improve Agricultural Productivity among countries in Africa.

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