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Impact of Agricultural Public Spending on Agricultural Productivity: Case Study of Kenya

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Abstract

Over the past years, a lot of efforts and calls have been made towards raising the levels of agricultural productivity to boost economic growth. This study was to examine the impacts of agricultural public spending on agricultural productivity in Kenya. The study adopted a descriptive research design and used a simple regression model to establish the significance of agricultural public spending on agricultural productivity. The series were transformed into natural logarithms given the inefficient and unreliable empirical results due to sharpness in time series in developing economies like Kenya. Also, log-linear specification provides better and unbiased empirical evidence. Correlation analysis was used to analyze the data and determine relationships between variables with the major determining factors being the correlation (R) and the p-value of significance. The results show that there is a positive and significant relationship between agricultural productivity, and public spending to the agricultural sector. Based on the findings of this study, it is recommended that the government should invest in proper directing and expansion of agricultural public spending which could have significant increasing-effects on agricultural productivity.

Keywords: agricultural productivity; agricultural labour productivity; commercial loans and advances; donor spending; public spending.

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1. Introduction

Agriculture is perceived as an engine for overall economic development of developing countries like Kenya. An increase in the share of government spending to 10%, involving investments in irrigation, agricultural research and extension services to farmers, would lift 1.6 million people above the poverty line [3]. A key emerging challenge for African countries over the years has been to increase agricultural productivity. Increased agricultural productivity can facilitate food production to outpace population growth [4]. Like other developing countries, Kenya uses public spending as a key instrument in promoting agricultural productivity. Although the government of Kenya has strived to improve agricultural productivity through increasing public spending to the agricultural sector, there is little evidence to suggest that these efforts have resulted in any significant impact on agricultural productivity, particularly smallholder agriculture. This study aimed to: (1) assess the impact of agricultural public spending on agricultural productivity in Kenya, (2) assess the impact of agricultural commercial banks credit and advances on agricultural productivity in Kenya and, (3) assess the impact of agriculture donor spending on agricultural productivity in Kenya.

The study adopted a descriptive research design and used a simple regression model to establish the significance of agricultural public spending on agricultural productivity. The series were transformed into natural logarithms given the inefficient and unreliable empirical results due to sharpness in time series in developing economies like Kenya [1]. Also, log-linear specification provides better and unbiased empirical evidence [2].

1.1 Literature Survey

Agriculture is the backbone of Kenya's economy and principal source of livelihood for the poor people. Seven out of ten Kenyans cultivate crops, raise livestock or engage in fishing and forestry [5]. Economic development therefore axes on an improvement in agricultural productivity which, in turn, hinges on the use of productivity-enhancing inputs. Kenya in its key agricultural policies identifies increasing productivity as one of the two strategic thrusts to achieve overall development and growth of the sector. Several countries, such as Burkina Faso and Ghana have made encouraging strides in increasing both public investments and productivity of agriculture from which Kenya could borrow lessons learnt [6].

A report by [7] suggests that in the face of budget constraints faced by countries like Kenya, the government would need to find ways to maximize the impact of their large and increasing expenditures on agricultural labour productivity.

1.2 Empirical Review

1.2.1 Agricultural Public Spending

A study by authors in reference [8] found positive effects of the combined public agricultural research and extension variable on agricultural productivity. An empirical analysis by authors in reference [9] on government spending, growth and poverty supported the view that government spending enhances agricultural productivity.

The analysis further showed that additional government expenditures on agricultural research and extension have the largest impact on agricultural productivity growth. The research concluded that a one percent increase in public spending on agriculture was associated with a 0.15 percent increase in agricultural labour productivity, with a benefit-cost ratio of 16.8. However, the research noted that implications are drawn for prioritizing additional or future public resources.

An empirical analysis by Institute of Economic Affairs in 2013 on public spending on agriculture in Kenya revealed that public spending on agriculture was exceedingly low. Less than the 10% was allocated to agriculture which contravenes the goal set by African leaders in the 2003 Maputo agreement [10]. In the face of such budget constraints faced by countries like Kenya, it is suggested that the government would need to find ways to maximise the impact of their large and increasing expenditures in social sectors on agricultural labour productivity. One way to do that is to first recognise that the mix of social expenditures is not growth-neutral and then, to try and target such expenditures to areas where they have the biggest and most immediate impact on productivity [11].

1.2.2 Agricultural Commercial Bank Loans and Advances

Authors in reference [12] found a positive relationship between commercial bank loans and advances and the level of agricultural output. Federal government capital expenditure contributed positively to the growth of agricultural output in Nigeria.

Authors in reference [13] argued that insufficient funding or credit facilities are among the key factors contributing to the continued underperformance of the agricultural sector. He concluded that credit facilities are significant to agricultural productivity. In their study on measuring and analysing agricultural productivity in Kenya note that the contraction of credit schemes in the agricultural sector is one of the key factors contributing to the decline in both labour and land productivity. In their study, an often-mentioned impediment to agricultural productivity in Kenya especially among small-scale farmers is the lack of credit. To them, it might be argued on the basis of the above findings that increased access to credit can positively influence productivity by increasing the farm's capital base. More directly, access to credit enables farmers to purchase farm materials such as fertilizers, improved seeds, and herbicides that are important for enhancing productivity.

Authors in reference [14] emphasize credit availability issue and state that "Making credit available and ensuring its productive use should therefore form the basic planks of any credit policy to foster agricultural productivity". author in reference [15] in his study on the agricultural credit access by grain growers in Uasin-Gishu County, Kenya noted that inaccessibility to agricultural credit by grain growers in Uasin-Gishu County, has contributed to the low and declining use of farm inputs resulting in a fall in agricultural productivity. He further notes that there is need for facilitation of access to agricultural credit, in order to raise amount of productive investment thereby playing a crucial role in elimination of farmers' financial constraints for investment in farm activities, increasing productivity and improving farm technologies. He further states that agricultural credit enhances productivity and promotes standard of living by breaking a vicious cycle of poverty for small-scale farmers.

According to reference [16] in their analysis of the effect of types of agricultural credit programmes on productivity of small scale farming businesses in Kenya found out that agricultural credit has the capacity to enhance the income of farmers who utilize it by more than 100%. It can therefore be concluded that agricultural commercial bank loans and advances have the potential to substantially improve agricultural productivity but needs to be expanded if considerable positive impact to the sector are to be realized. This provides the need for its inclusion in the model.

1.2.3 Agricultural Donor Spending

Due to the food price crisis, donors have re-focused on agriculture in recent years. The upward trend is largely concentrated in the region's larger countries—Nigeria, South Africa, Kenya, Ghana, Uganda, Ethiopia, and Sudan, which together accounted for 70% of public R&D spending in 2008 [17].

A study by authors in reference [18] estimated donor funding for agricultural R&D, a key influence of agricultural productivity, in Sub-Saharan Africa in 2009 at approximately \$450 million. [19] places the 2008 figure at about \$245.6 million (in constant 2007 prices). [20] using data for 98 less developed countries between 1970-1985 and using variations of grouping these countries (by relative size of agricultural sector, income levels, relative external debt) found that donor spending has improved agricultural productivity in Asia, which is not surprising given the egalitarian nature of land reforms in most Asian countries. Agricultural productivity in Sub-Saharan Africa has been affected to a lesser extent. This evidence, however, has not been found for Middle Eastern and Latin American countries, where land reforms were restricted in scope with distorted goals prompted by government malpractice and unequal distribution of land. Likewise, donor spending has been less effective in boosting agricultural productivity in countries with high levels of external debt.

Reference [21] a proponent of “agricultural –first” approach, recognizes the importance of foreign aid with emphasis on agriculture and states that it has stimulated development in a number of Asian and Latin American countries. The success of the Green Revolution has substantially increased food production in Asia in the late 1960s and 1970s. In this regard, foreign aid intervention has emphasized the importance of agricultural production in tackling food bottlenecks as well as improving social welfare.

2. Research Methodology

The study adopted a descriptive research design since the study was intended to gather quantitative and qualitative data to establish the impact of agricultural public spending on agricultural productivity. An intensive data collection and analysis of required data was conducted at the beginning of this study. According to reference [22] descriptive research was used to obtain information concerning the current status of the phenomena to describe "what exists" with respect to variables or conditions in a situation.

Secondary data was collected on agricultural value added, number of employees in the agriculture sector, agricultural public spending, and agricultural donor spending, and agricultural commercial loans and advances. The data mainly used time series data collected for the period 1973 to 2012. Secondary data was used given its availability and cost effectiveness and convenience [23].

Also, secondary data enables the generation of new insights from previous analyses [24]. A rapid verification process was undertaken to remedy the lack of control over the quality of the secondary data used [25]. It is believed that this process not only enhanced the reliability but also the findings and conclusions of the study.

An analytical model of a linear multiple regression equation of the form shown below was developed as:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + e_1 \quad (1)$$

Where by: Y= Labour productivity (proxy for agricultural productivity); α = Autonomous factors; X_1 = Agricultural public spending; X_2 = Agricultural donor spending. β_1 = Coefficient for Agricultural public spending; β_2 = Coefficient for Agricultural donor spending; e = Error term - Captures all other explanatory variables which influence agricultural productivity but are not captured in the model.

2.1 Regression Model

Table 1: Regression

| Dependent Variable: LOG(LP) | | | | |
|--|-------------|------------|-------------|----------|
| Method: Least Squares | | | | |
| Sample: 1973 2012 | | | | |
| Included observations: 40 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | 10.52016 | 0.450370 | 23.35896 | 0.0000 |
| LOG(ADS) | 0.090830 | 0.019373 | 4.688545 | 0.0000 |
| LOG(APS) | 0.034259 | 0.024698 | 1.387118 | 0.1739 |
| R-squared | 0.719906 | | | |
| Adjusted R-squared | 0.696565 | | | |
| S.E. of regression | | | | 0.096710 |
| Sum squared resid | | | | 0.336699 |
| F-statistic | | | | 30.84276 |
| Prob(F-statistic) | | | | 0.000000 |
| Durbin-Watson stat | | | | 1.130627 |
| Y = 10.52016+0.090830X ₁ +0.034259X ₂ + e ₁ | | | (2) | |

From the regression model in table 1, agricultural donor spending has the highest coefficient and t-statistic of 0.090830 and 4.688545 respectively.

3. Results from the Study

3.1 Agricultural Donor Spending

The agriculture donor spending has a coefficient and t-statistic of 0.090830 and 4.688545 respectively.

The t-statistic is greater than 2 meaning that that donor funds are very significant in influencing the levels of agricultural productivity in Kenya. The coefficient is higher than that of Agriculture public spending thus showing the importance donors in influencing the agricultural productivity.

3.2 Agriculture Public Spending

The Agricultural public spending has a positive coefficient of 0.034259 shows that it positively determines agricultural productivity. Agricultural public spending has a low probability of t that shows a 1.7% chance of the parameter being zero. It shows that an increase of 0.034259 in agricultural public spending will lead to 1% increase in agricultural productivity.

4. Conclusion

It conforms to the observation by Mohan et al (2010) that increasing R&D public expenditure exhibits increasing productivity and the analysis of the GoK budgets over the period 2009/10-2011/12 that shows that donor participation in agriculture and particularly ARD increased from 1.9% to 8.2%.

The study also conforms to those of the Institute of Economic Affairs (2013) in their analysis on public spending on agriculture in Kenya which revealed that public spending on agriculture was exceedingly low at less than the 10%.

Findings of the paper indicate that there is a positive and very significant relationship between agricultural labour productivity, proxy for agricultural productivity, and agricultural donor spending. It is evident that various types of agricultural spending have differential impacts on agricultural productivity. Based on the findings it is recommended that government should continue to encourage expansion of resources by donors to agriculture in order to adequately improve agricultural productivity.

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