Journal of Social Sciences & Humanities
Publisher: Kabul University

Available at https://jssh.edu.af

Impact of Government Expenditure on Economic Growth: Focusing on Afghanistan's Agricultural Sector

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Received: Feb 15, 2025
Revised: April 04, 2025
Accepted: April 24, 2025

Keywords
- Afghanistan
- Agricultural Sector
- *Economic Growth*
- *Government Expenditure*

Abstract: Economic growth denotes to the steady upsurge in a country's real Gross Domestic Product (GDP) and is considered a key area for reducing poverty and achieving sustainable development. To support economic growth and long-term development, government expenditure should focus on engendering an enabling environment for private sector expansion and addressing market inefficiencies. In this context, the existing study examines the encouragement of government spending on economic growth, with particular attention to the agricultural sector in Afghanistan. For empirical analysis, the Augmented Dickey-Fuller (ADF) test, Johansen Co-integration test, and Ordinary Least Squares (OLS) method were employed. Results from the Johansen Co-integration test specify a long-term relationship among government agricultural expenditure, agricultural employment, the exchange rate, and economic growth in Afghanistan. Moreover, regression analysis outcomes show that government spending on agriculture significantly influences the country's economic growth, whereas employment in agriculture and the exchange rate do not have a statistically significant impact. Despite these findings, Afghanistan's agricultural sector continues to face several challenges, such as a lack of highly educated workers, inadequate infrastructure, weak agricultural marketing systems, and limited irrigation facilities. Therefore, it is suggested that the Afghan government increase investment in the agriculture sector and ensure the efficient and transparent use of financial resources. Strengthening this sector would ultimately enhance agricultural productivity and foster economic growth across the country.

To Cite this Article: Hemat, W., Wardak, P., Rashidi, M. H. (2025). Impact of Government Expenditure on Economic Growth: Focusing on Afghanistan's Agricultural Sector. *Journal of Social Sciences & Humanities 2*(2), 12-24. https://doi.org/10.62810/jssh.v2i2.61

INTRODUCTION

The influence of government spending on agriculture and economic development has been widely considered (Dkhar & De, 2018), (Maïga, et al., 2021). Agriculture plays a decisive role in the economies of less developed countries like Afghanistan. Even in developed nations,

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Available online at https://jssh.edu.af/jssh/article/view/61

agricultural development remains a major focus, as the sector delivers food, raw materials for industrial production, and a significant source of revenue (Praburaj, 2018). In today's world, the documents and studies from the industrialized countries and developing countries have exposed that agriculture is the engine of the country's economy, which has a noteworthy contribution to the economic growth in the non-agricultural sectors and overall economy of the countries, and plays a substantial role in poverty reduction (Pingali , 2006). As the population is growing rapidly in the world, therefore food security is an imperative issue for the countries, and agricultural sector is plying a vital and strategic role in food security, to tackle down the hunger undernourishment and guaranteeing food security in the countries the agricultural sector will consider as an important sector and more financial and technical sources have to be allocated to this sector for the purpose of development and expansion (Pawlak & Kołodziejczak, 2020). Afghanistan is known for its inimitable climatic environments, which are ideal for a extensive range of crops, vegetable species, and seed production. And the country was formerly the global leader in raisin production in 1960, and it was a leading international provider of horticulture products in the 1960s and 1970s, with export earnings from the industry accounting for 48 percent of overall export revenues (Yousufi, 2016).

Afghanistan's economy is predominantly agricultural and more than 80 percent of the country's population lives in poverty, with approximately 90 percent of the poor residing in pastoral areas, where agriculture plays an essential part in their livelihoods (Bank, 2014). Foreign financing to Afghanistan has decreased in recent years, but private sector growth will unquestionably remain a focus. It is more significant than ever earlier for Afghanistan to establish a homegrown economy that is not reliant on foreign aid. Civil stability is strengthened by strong economies in which everyone has access to education and appropriate work. A strong private sector generates domestic money, reduces reliance on imports, and creates jobs that subsidize to the country's economy (FAO,2018).

Agricultural growth is one of the effective and important tools for reducing poverty, increasing mutual prosperity among people in society and feeding approximately 9.7 billion people expected by 2050. Agriculture is also important for economic growth; in 2018, it accounted for 4 percent of global GDP, and in some least development countries (LDCs), it can account for more than 25 percent of GDP (Bank,2022). Agriculture plays a crucial role in promoting food security, and numerous scholars have explored the influence of public sector investment in agriculture on broader economic development. In this regard, Chandio and Abdul (2016) conducted a study focused on Pakistan, examining how government expenditure influences agricultural development and economic performance. Applying the OLS technique, along with the ADF unit root test and the Johansen co-integration approach, they uncovered a long-term relationship between agricultural public expenditure, sectoral output, and economic development. Their outcomes confirmed that both agricultural production and government investment in the sector significantly boost the country’s economic development. Nevertheless, the research also found numerous obstacles confronting the agricultural sector, such as limited funding for agricultural programs, poor

infrastructure, insufficient access to markets for farmers, and a lack of adequate irrigation systems. However, a similar study in Nigeria by Iheanacho (2017) using Johansen Co-integration and Granger causality approach to cointegration analysis, the empirical analysis of the article presented that government capital and recurrent expenditure is indispensable for generating new jobs and opportunities in the agricultural sector.

Idoko and Jatto (2018) conducted research on how government expenditure in the agricultural sector influences economic development in Nigeria. To scrutinize the data, they used OLS estimation along with the Johansen Co-Integration approach. Their findings demonstrated a positive and statistically substantial connection between public agricultural expenditure and economic growth, with evidence of a long-term connection among the variables. However, the article also indicated that domestic savings had no meaningful influence on economic development, showing minimal contribution to the nation's economy.

In another study, Saad and Kalakech (2009) explored the impact of different groups of public expenditure on sustainable economic growth in Lebanon during the period from 1962 to 2007. Their research focused on government expenditure in sectors such as defense, education, health, and agriculture. The long-term analysis revealed that investment in education positively influenced economic growth, although in the short term it had a negative effect. Defense spending, conversely showed a negative influence on growth in the long term and was initiate to be statistically insignificant in the short term. Health sector spending was negatively connected with economic development over the long run and had no substantial effect in the short run. Furthermore, government spending on agriculture had no meaningful outcome on economic development in either the short or long run.

Selvaraj (1993) focused on the Indian agricultural sector, emphasizing its dependence on public financing, particularly during the first five-year plan. The study aimed to assess how government spending affected agricultural performance using time series data. Findings suggested that policy decisions regarding agricultural expenditure play a dynamic role in shaping agricultural outcomes. An upsurge in government investment in agriculture was connected with positive growth in the sector, while reduced funding was linked to negative impacts.

Similarly, Tijani et al. (2015) analyzed the association among government agricultural spending and economic development in Nigeria over the period 1970 to 2006. By employing time series data and econometric techniques, their research showed that in the long term, government investment in agriculture significantly boosted economic growth. The study also exposed that while capital expenditure positively influenced growth, recurrent expenditure had no important inspiration on the country’s economic performance.

Sasmal & Sasmal (2016) explored the effect of government spending on economic development and poverty alleviation in India. For the persistence of data analysis, mutually fixed effects and random effects models were used. The outcomes of the article presented that economic growth and public expenditure on infrastructure and developmental sectors

have a positive and noteworthy impact on poverty decrease. In some states of India, the per capita income is very high in comparison to other parts of the country. Therefore, poverty is also in decline mode, and the majority of people have risen above the poverty line in recent years. The country has spent a huge amount of money on the developmental and infrastructure sectors in recent years through the union budget, which has had a positive and important influence on the alleviation of poverty. Magdalena & Suhatman (2020) study examined the influence of government expenditure, domestic investment, and foreign investment on the economic growth of the primary sector in central Kalimantan. For the experimental examination of the data, multiple liner regression was performed. The outcome of the research found that government expenditure, domestic investment, and foreign investment together have a positive and momentous effect on the economic development of the primary sector, while simultaneous domestic and foreign investment have an insignificant influence on economic development, and public expenditure alone has a positive and noteworthy influence on economic development.

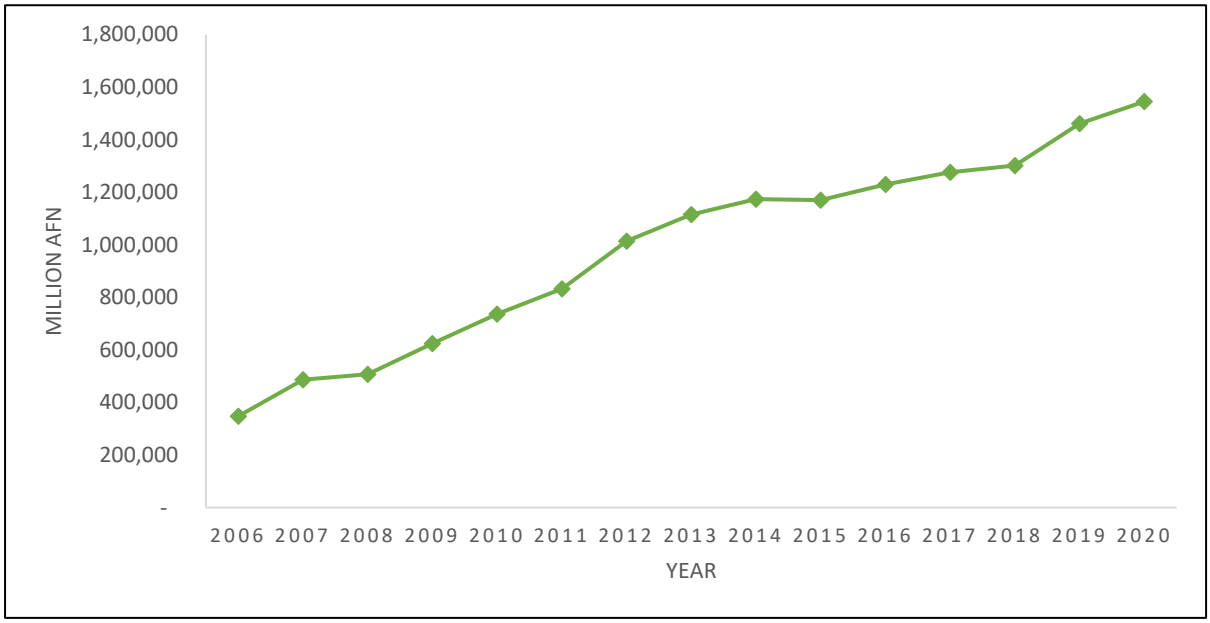

Figure 1: *Gross Domestic Product Trends*

Source: World Development Indicators WDI, 2021

The above Figure 1 depicts the trend in Afghanistan GDP from 2006 to 2020. Afghanistan's GDP was 1.5 trillion Afghani by 2020. The graph clearly showing that the country's GDP trend was increasing up until the year 2012, after which it is increasing but slowly, and the reason is clear in 2013, the USA began withdrawing troops and reducing foreign aid to the country, both of which had a negative consequence on the country's GDP trend.

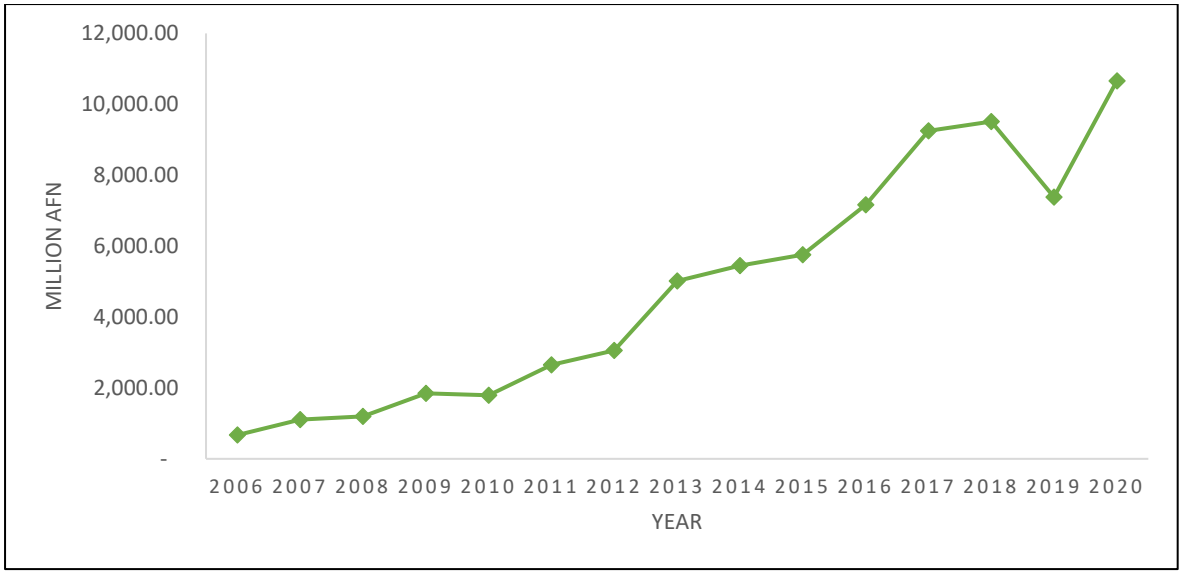

***Figure 2**: Agricultural Expenditure Trends*

Source: Ministry of Agriculture Irrigation and Livestock Expenditure Reports (Qatiya) , 2021

The above Figure 2 displays the trend of government agricultural expenditure from 2006 to 2020. The country spent a very low sum of 671.59 million Afghani in 2006, but this has enlarged with time, with the country's expenditure reaching 10.66 billion Afghani in 2020. Agricultural expenditure in the country fluctuated during the time period specified, although the overall trend was upward.

This article primarily aims to scrutinize the impact of public spending on the agricultural sector and the economic development of Afghanistan between 2006 and 2020. Specifically, it seeks to evaluate how public expenditure on agriculture has subsidized to the country's economic development. Additionally, the article intends to explore the nature of the connection among government investment in agriculture and Afghanistan's economic development. Another key objective is to determine whether a long-run connection exists among agricultural government expenditure and economic development within the country.

RESEARCH METHOD

This article objects to analyze the effect of government expenditure on the agricultural sector and economic growth in Afghanistan during the period from 2006 to 2020. It makes use of time series data covering critical variables such as GDP at constant prices, government agricultural spending, agricultural employment, and the exchange rate. The data has been gained from the Ministry of Agriculture, Irrigation, and Livestock (MAIL, 2022) and the World Development Indicators (World Bank, 2022).

Model Specification

Model specification denotes to the scientific illustration of the connection among dependent and independent economic variables. In the context of post-Keynesian economic thought, numerous development models have been formulated to better understand the role of

government in driving economic growth. These models attempt to address a key issue in development economics: the disparity in wealth between nations. One of the notable models from this school of thought is the Harrod-Domar model, which posits that an economy's output is influenced by its available capital and labor. According to this model, an increase in capital and labor inputs leads to higher levels of production. The following production function is derived grounded on the principles of the Harrod-Domar framework.

Y= F (K, L) ……. (1)

In this model, *Y* represents output, *K* denotes capital, and *L* stands for labor. The Harrod-Domar model assumes a fixed capital-output ratio and argues that economic growth alone may not be adequate to sustain full employment. Consistent with Keynesian thought, the theory maintains that an economy does not inherently achieve stable growth and full employment without intervention. Therefore, the model highlights the critical role of government in stimulating and guiding economic expansion (Harrod, 1939; Domar, 1946). Illustration from this theoretical outline, it can be inferred that

RGDP= F (AGER EX, EMPL, EXR) …… (2)

Where:

GDP = Gross Domestic Product in (million Afghani)

AGR EX= Agriculture Expenditure (million Afghani)

EMPL= Employment in Agriculture (Million people)

EXR= Official exchange rate (annual average based)

Econometrically the model is specified as:

$LnGDP = \beta_0 + \beta_1 LnAGR\ EX + \beta_2 LnEMPL + \beta_3 LnEXR + \mu$…… (3)

Where,

where prefix “Ln” is used for the natural logarithm of the time series variables and β_0 is Intercept and d *β1*, *β2*, and *β3* are the elasticity coefficients of GDP with respect to AGR EX, EMPL and EXR, respectively. “μ” is the white noise error term.

FINDINGS

Table 1 presents the data description for the variables (Ln GDP, Ln AGR EX, Ln EMPL, and Ln EXR) over the period from 2006 to 2020. The outcomes from the Jarque-Bera test specify that all variables have probability values exceeding 0.05. Based on this, the null hypothesis of normal distribution cannot be rejected, confirming that the time series data are normally distributed. Additionally, to assess the presence of multicollinearity within the model, the Variance Inflation Factors (VIFs) were considered. The VIF values for all independent variables were found to be well below 10, signifying that multicollinearity is not a concern in this model.

***Table 1**: Descriptive Statistics*

	Ln GDP	**Ln AGR EX**	**EMPL AGR**	**Ln EXR**
Mean	13.71927	8.177215	1.404894	4.057035
Median	13.92495	8.520431	1.381860	4.014173
Maximum	14.25066	9.274472	1.484419	4.353344
Minimum	12.76008	6.509645	1.349760	3.838429
Standard Deviation	0.452504	0.885816	0.041502	0.182288
Skewness	-0.772916	-0.432236	0.512704	0.422630
Kurtosis	2.395899	1.898291	1.924250	1.680122
Jarque-Bera Probability	1.721583	1.225672	1.380437	1.535339
(P-Value)	(0.422827)	(0.541812)	(0.501466)	(0.465205)
VIF	0	3.523602	2.861779	3.512388

Source: Authors Calculations.

Unit Root Test Result

We used the ADF test to regulate whether the data is stationary or non-stationary, and meanwhile most economic variables are non-stationary at the level, we will check for the existence of unit roots for each variable. If any variable has unit roots, the related series is deemed non-stationary. Non-stationary series estimation can prime to spurious regressions (Granger, 1969). The assessed outcomes of the ADF test is shown in Table 2, explaining that all variables are stationary at first-order difference I (1).

***Table 2:** ADF Test Results*

Variables	**Level I(0)**			**First Order Difference I(1)**		
	Intercept	**Intercept and Trend**	**No Intercept and Trend**	**Intercept**	**Intercept and Trend**	**No Intercept and Trend**
Ln GDP	-3.827314 (0.0137)	-2.33279 (0.3927)	2.513915 (0.9936)	-4.32253 (0.0064)	-5.248263 (0.0059)	-2.958524 (0.0065)
Ln AGR EX	-2.212355 -0.2125	0.87245 (0.9988)	3.016676 (0.9978)	-5.167616 (0.0016)	-3.685682 (0.0701)	-0.97787 (0.2709)
Ln EMPL	-1.472834 (0.5172)	-1.607619 (0.7366)	0.001814 (0.6663)	-1.813728 0.3581	-1.18885 (0.8682)	-2.054060 (0.0424)
Ln EXR	0.476683 (0.9787)	-5.515704 (0.0062)	2.307285 (0.9910)	-2.494869 (0.1385)	-2.480855 (0.3300)	-2.014011 (0.0459)

***Source:** Authors calculations.*

Johansen-Co-Integration Test

The Johansen test of co-integration was accomplished to perceive if the series having a unchanging long-run relationship between the dependent variable (GDP) and the independent variables (AGR EX, EMPL, and EXR). (Johansen, 1988) The outcomes of the Johansen Co-integration tests are show in the Table 3. The values of the Trace statistic (80.35988) and the values of the Max-Eigen statistic (41.08568), which are higher than their critical values (47.85613) and (27.48434), explain that there happens a long-term association between dependent and independent variables. which can reject the null hypothesis of no co-integration. In both, the Trace statistic and Max-Eigen statistic tests specify one and two co-integrating equations at the 5% level.

Table 3: *Johansen Co-Integration Test Results*

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05	p-Value**
None*	0.957593	80.35988	47.85613	0.0000
At most 1	0.852008	39.2742	29.79707	0.0030
At most 2	0.652764	14.43642	15.49471	0.0717
At most 3	0.051376	0.685655	3.841465	0.4076
Trace test indicates 2 co-integrating eqn(s) at the 0.05 level				
*denotes rejection of the hypothesis at the 0.05 level				
** MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05	p-Value**
None*	0.957593	41.08568	27.58434	0.0000
At most 1	0.852008	24.83778	21.13162	0.0143
At most 2	0.652764	13.75077	14.26460	0.0601
At most 3	0.051376	0.685655	3.841465	0.4076
Max-eigenvalue test indicates 2 co-integrating eqn(s) at the 0.05 level				
*denotes rejection of the hypothesis at the 0.05 level				
** MacKinnon-Haug-Michelis (1999) p-values				

Source: Authors calculations.

Regression Analysis

The OLS method was utilized to examine the impact of government expenditure on agriculture and economic growth in Afghanistan, The outcomes of the regression analysis revealed an R-squared value of 96%, indicating a strong model fit, meaning that around 96% of the variation in the dependent variable is reported for by the independent variables. The F-statistic was calculated at 99.15 with a corresponding probability value of 0.0000, highlighting the overall significance of the model. Additionally, the Durbin-Watson (DW) statistic was 2.13, suggesting that serial autocorrelation is not an issue in the model, as shown in Table 4.

The regression outcomes show that a 1% increase in government agricultural expenditure (AGR EX), holding other factors constant, results in a 0.58% rise in real GDP (RGDP). This finding confirms a positive connection among RGDP growth and government investment in agriculture. On the other hand, a 1% rise in agricultural employment (EMPL), keeping other variables constant, leads to a 0.22% decline in RGDP, suggesting a negative association between employment in agriculture and real GDP growth. Given its statistical insignificance, it indicates that employment in the agricultural sector does not significantly contribute to RGDP growth. Similarly, a 1% increase in the exchange rate (EXR) results in a 0.42% decrease in RGDP, also reflecting a negative relationship. However, the exchange rate's effect is statistically insignificant, implying that it does not have a notable influence on real GDP growth

***Table 4**: Regression Results*

Variables	Coefficient	Std. Error	t-Statistics	p-Value
C	11.00682	1.049243	10.49025	0.0000
Ln AGR EX	0.580073	0.054803	10.58459	0.0000
Ln EMPL	-0.227488	1.050208	-0.216613	0.8325
Ln EXR	-0.421763	0.313602	-1344898	0.2057
R-squared.	0.964338			
Adjusted R-squared	0.954612			
Durbin Watson stat	2.13767			
F-statistics	99.15094			

Source: Authors calculations.

DISCUSSION

Focusing specifically on the consequence of public spending on economic growth within Afghanistan's agricultural sector, the findings from the co-integration test and subsequent regression analysis deliver valuable insights into the relationships among government agricultural spending, agricultural employment, the exchange rate, and economic performance. The co-integration results confirm a long-run equilibrium association between these variables, demonstrating that despite short-term fluctuations, government investment in agriculture, shifts in agricultural employment, and changes in the exchange rate are closely tied to economic growth over time. This long-run relationship suggests that changes in any one of these factors will ultimately affect the others, underscoring the structural interconnectedness within Afghanistan’s economy. These outcomes are reliable with the studies by Magdalena and Suhatman (2020) and Musaba et al. (2013), which similarly found a positive link between agricultural government expenditure and economic growth.

The short-run regression analysis also shows a strong model fit, with the independent variables collectively explaining a noteworthy share of the variation in economic growth. In addition, the model passes key diagnostic tests, confirming the robustness and reliability of the results. Among the individual factors, government spending on agriculture is positively

connected with economic growth, suggesting that increased public investment in this sector supports economic expansion. This highlights the critical importance of agriculture in Afghanistan's development, given its role in food security, employment, and rural livelihoods.

On the other hand, agricultural employment shows a negative connection with economic growth, although the result is statistically insignificant. This could specify that, despite a large share of the workforce being engaged in agriculture, the sector's low productivity limits its contribution to economic growth. Thus, simply expanding employment without enhancing productivity through better skills, technology, or efficiency improvements may not yield positive growth outcomes. Similarly, the exchange rate is negatively related to economic growth, but this consequence is also statistically insignificant. This finding proposes that while fluctuations in the exchange rate may influence inflation, the cost of imports, and investment, their direct impact on Afghanistan's economic growth remains relatively weak. This observation supports the findings of Jamal et al. (2019), who noted that increased agricultural employment can lead to higher poverty levels over time, indicating a negative link between agricultural employment and economic growth.

Overall, these findings highlight the vital role of government spending in agriculture as a catalyst for economic growth. However, to fully realize the benefits, it is crucial to complement financial investment with measures aimed at boosting labor productivity, promoting technological adoption, and ensuring macroeconomic stability, particularly in managing the exchange rate. Additional investments in rural infrastructure, education, and agricultural innovation are necessary to reinforce the sector's long-term contribution to sustainable economic development.

CONCLUSION

The study examined the impact and association between government spending on agriculture and economic growth in Afghanistan from 2006 to 2020. For the landscape of the effect and long-run relationship of the variables, the multiple regression (OLS) approach and the Johansen co-integration test were performed to attain the objectives of the study. The results of the study exposed that government expenditure on agriculture has a favorable and substantial association with Afghanistan's economic growth. The outcomes also demonstrated that the variables (GDP, AGR EX, EMPL, and EXR) in the model had a long run relationship. Employment in agriculture and exchange rates, on the other hand, were found to be insignificant. The fact that the country's employment in agriculture and exchange rate did not contribute to economic growth. However, During the past two decades, the country's economy has been dependent on foreign aid, resulting in a large trade deficit and a huge amount of goods imported from other countries, while the country has limited production of goods within the country. The government has also placed a low priority on the industrial sector in order to boost the production of goods. the country needs more foreign currency to import, thus if the currency depreciates in value and the rate of the Afghani rises, it has a negative influence on imports, and imports to the country fall, therefore the exchange rate in

the empirical examination of the data has also insignificant and even the exchange rate has negative influence on economic growth in the country. It is advised that the government implement policies and initiatives aimed at supporting domestic production, especially within the agriculture, industry, and mining sectors. This approach would help establish a sustainable balance between imports and exports and contribute to stabilizing the currency exchange rate. Additionally, monetary authorities should closely monitor the foreign exchange market to prevent unusual currency fluctuations, ensuring their primary objective of maintaining price stability. To further this goal, the government is encouraged to boost public investment in the agricultural sector and foster an environment that encourages private sector involvement in agricultural development, particularly in areas such as processing, preservation, exports, and environmental services.

Acknowledgements

I extend my heartfelt gratitude to all the students who participated in this study; your contributions were invaluable. I would also like to sincerely thank my colleagues for their unwavering support and assistance in completing this research.

Conflict of Interest: The authors declared no conflict of interest.

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