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Contribution of Expenditure to Agriculture Growth in Nepal

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Abstract

Background: Among the different macroeconomic sectors, agriculture is critical to the expansion of Nepal's economy. Agriculture is the main strength for the development of trade and the service industry. Agriculture has become the backward linkage for trade and service. The contribution of expenditure is vital for the growth and agricultural development of Nepal.

Objectives: The purpose of the study is to determine contribution of expenditure to the agricultural economic growth in Nepal.

Methodology: The descriptive and causal research designs were used for the study. Annual time series from 1974/75-2020/21 was used as the data. The research used the Auto-Regressive Distributed Lag model (ARDL) approach of cointegrationa. Moreover, unit root test, bound test, residual diagnostics and normality test were used.

Results: The empirical result indicates a short run good association between the agriculture labor force, gross fixed capital formation, capital expenditure and total food crops and long term collaboration between the agriculture labor force, gross fixed capital formation, total food crops and total cash crops. The disequilibrium is corrected in the one lag period with a speed of adjustment of 0.07 per cent.

Conclusions: The study concludes that there is an association between government expenditure to agriculture growth of Nepal. So, government spending and agriculture expansion are associated in the long run.

Implications: Government expenditure must increase to escalate the economic growth of agriculture, reflected via a source of economic growth in Nepal.

Originality: The study is purely original and nowhere published yet. Likewise, no grants have been obtained during the period of investigation on this issue.

Paper type: Research paper

Keywords: Agriculture, ARDL, expenditure, economic growth

Paper type: Research paper

JEL Classification: Q, C51, C32

Introduction

Agriculture is the prerequisite for the economic development of Nepal. Most Nepalese are highly engaged in the agriculture sector. However, leaving the occupation, especially agriculture, has been increasing. Agriculture has become the subsistence level in Nepal. Using science-led agriculture technology, subsistence agriculture should be transformed into commercial agriculture (Paudel, 2016). The population's reliance on agriculture is gradually decreasing as a result of agriculture's modernization and commercialization as well as the growth of services in the secondary and tertiary sectors.

Moreover, the labour force shifts from agriculture to other sectors. Approximately 60.4 per cent of the total population engaged in the agricultural sector, accounting for only 27 per cent of the country's total GDP, which is expected to decrease to 22.3 per cent at the end of the periodic plan (National Planning Commission, 2020). Agriculture is the backbone of an economy, especially for an underdeveloped country like Nepal. However, the portion of this sector in GDP has consistently declined. After the liberalization period, the input for the industry also decreases. The cultivated land has the potential to produce agriculture in Nepal. The Nepal Labor Force Survey of 2008 reported 73.9 per cent of the population in engaged in agriculture, but that decreased to 60 per cent in 2018 (Ministry of Finance, 2021).

The main source of income is agriculture in Nepal. The population structure changes from rural to urban areas as the workforce has also changed. Moreover, agriculture could not become the source of income for the whole year, either in terms of working days or the wage rate received by the farmers. According to Schultz's theory, the excess population could lead to more production for agricultural growth. Moreover, geographical diversity has offered a variety and immense potential in the agriculture sector of Nepal. By advancing horticulture, vegetable and food crop farming, and different sorts of animal husbandry, it is possible to multiply agriculture production by three to four. Past agricultural development accomplishments haven't been satisfactory. Despite being given top attention, the agriculture sector has not grown as anticipated. (Karna, 2004).

In Nepal, agricultural growth is necessary for survival. However, the shift of labour force from agriculture to other sectors has not brought any social changes and benefits and has not benefitted the secondary and tertiary sectors. Ministry of Finance (2016) revealed that the Nepalese economy is undergoing structural changes. Moreover, the distribution of fertilizer in Nepal and government subsidies to the needy people of Nepal has always been promoted to increase productivity and make the country prosperous. Despite these efforts, Nepal could not prosper in agriculture products because Nepal does not produce chemical fertilizers and depends on imported fertilizers (Paudel, 2016). The country could not achieve the goal of double-digit agricultural growth. In this scenario, this sector demands heavy investment to increase production. In the initial stage of development, the agriculture sector is likely to provide the largest markets for traditional goods. Agriculture and industry growth are complementary. Moreover, overall agriculture productivity in developing countries is less than one-twentieth of the level in developed countries (Thirlwall, 2006).

Despite the different topologies, subsistence agriculture has been a tradition in Nepal since ancient times. Road, electricity irrigation, agriculture labor force, and technological and capital goods adaptation by farmers are crucial to the agriculture growth of Nepal. Nepal lacks commercial farming and occupation. Commercial farming could have a comparative advantage for farmers enabling them to transform the Nepalese economy toward a favorable trade balance, encourage exports, and cut back on agricultural imports.

Nepal has been producing cash and food crops; neither has attracted the farmers. The subsistence type of agriculture, reliance on monsoon, small land holding, labor-intensive agriculture production, and unevenly distributed cultivable land productivity give something to the state of Nepal's agriculture is

deteriorating. Specifically, the recent trend of foreign employment and value creation also hinders the development of this sector. Despite different ups and done in this sector, the Nepali agricultural sector needs fast growth. The cash crops product can help reduce the trade deficit and correct the balance of payments in Nepal. In light of the current scenario, this study intends to identify the factors that influence non-economic growth and explore the role that agricultural goods play in Nepal's economic development.

The paper proceeds: first, a literature review follows the introduction. Second, we describe the research method, i.e., the data collection and analysis procedures. The paper concludes with a discussion of the results, followed by research limitations.

Literature Review

Limited studies examine the contribution of expenditure to the agricultural growth of Nepal. Adhikari (2015) discussed the effect of agriculture on the overall economy of Nepal. According to the study, government spending on agricultural significantly contributes to the GDP. Nevertheless, agricultural investment is not encouraging; agriculture received only about three per cent of overall spending by the government from 2002 to 2014. Similarly, Gauchan (2008) concluded agricultural development contributes to reducing poverty, ensuring food security, and the economy. The government needs investment in suitable technologies, inputs, resource management options, and market facilities to increase agricultural products. Moreover, Wagle (2016) found government expenditure in the agriculture sector does not change much in Nepal. However, the empirical evidence confirmed that investment in the agriculture sector stimulates Nepal's economy. Moreover, Paudel (2016) concludes that subsistence agriculture needs remodeling to an enterprise-based that transforms the economy of Nepal into a positive trade balance by encouraging export and lowering imports of agricultural products. Adhikari (2015) found that Agriculture investment is not promising, getting only approximately three per cent of all government spending between 2002 and 2014. The analysis finds that while domestic savings and foreign direct investment in agriculture were modest, government spending on agricultural contributed significantly to the gross domestic product. The government's spending increased at a significantly slower rate than the ministry of agricultural development's budget. The analysis came to the conclusion that the importance of government spending on agriculture to the national economy. Pant (2013) explored how labor migration affects Nepal's poverty and agricultural growth. To determine the effects of migration on poverty and agricultural output, the study used time series data spanning 19 years using an econometrics model. The study concluded that migration decreases poverty but decreases agriculture production.

Regmi and Weber (1996) concluded that realistic sustainable agricultural development for small farmers is still a fiction. In addition, Wajeetongratana (2020) observed the favorable effect of a number of industrial characteristics on domestic and worldwide markets. The previous studies have focused on the relationship between government spending and economic expansion, labor migration, poverty, and agriculture growth. Opportunities and drawbacks of industrializing agriculture in Nepal for small farmers and the development of sustainable agriculture .This study, therefore, assesses the contribution of expenditure to the agricultural growth of Nepal.

Research Methodology

Data and variables

This study employed secondary sources to examine time series data spanning 47 years, from FY 1974/75 to AD 2020/21. Real gross domestic product in agriculture, non-agriculture labor force, gross fixed capital formation, current expenditure on agriculture, total production of food crops, and total production of cash crops are the variables used for empirical analysis.

Table 1 Sources and Measurement of Variables

Variables Descriptions	Sources	Unit
Real Gross Domestic Production Agriculture (RGDPAG)	Various issues of Economic survey (MOF,2010/11,2020/21)	In ten million
Agriculture Labor Force (ALF)	Various issues of Population Monograph of Nepal (CBS)	In number
Gross fixed capital Formation (GFCF)	Different issues of Economic Survey (MOF),2010/11,2020/21)	In ten million
Current Expenditure on Agriculture (CEXPAG)	Economic Survey (MOF) issued in ,2010/11,2020/21)	In ten million
Total production in Food Crops (TPFC)	Economic Survey, various issues (MOF, 2010–11, 2020–21)	Thousand metric ton
Total Production in Cash Crops (TPCC)	Several issues of the Economic Survey (MOF, 2010–2011, 2020–21).	Thousand metric ton

Table 1 shows the Real Gross Domestic Production Agriculture (RGDPAG) used as an endogenous variable. Agriculture Labor Force (ALF), Gross fixed capital formation (GFCF), Current Expenditure on Agriculture (CEXPAG), Total production in Food Crops (TPFC), and Total Production in Cash Crops TPCC are used as exogenous variables under study.

Model Specification

This study's research design is a causal research design. To examine the connection between agriculture expenditure and agriculture growth, we used the log of real gross domestic product on agriculture, the dependent variable and log of the agriculture labor force, the log of gross fixed capital formation, the log of capital expenditure on agriculture, the log of total production food crops and log of total product cash crops independent variables. To meet the research objectives, we used the following econometric model.

$$RGDPAG_t = \beta 0 + \beta_1 ALF_t + \beta_2 GFCF_t + \beta_3 CEXPAG_t + \beta_4 TPFC_t + \beta_5 TPCC_t + E_t \quad \ldots (1)$$

To confirm the linearity in variables and coefficient researcher has used the natural log transformation in equation (1). The new econometric model (2) is as follows.

$$lnRGDPAG_t = \beta 0 + \beta_1 lnALF_t + \beta_2 lnGFCF_t + \beta_3 lnCEXPAG_t + \beta_4 lnTPFC_t + \beta_5 lnTPCC_t + E_t \ldots (2)$$

Where,

(lnRGDPAGt) = Log of Real Gross Domestic Product on Agriculture
(lnALFt) = Log of Agriculture Labor Force
(lnGFCFt) = log of Gross Fixed Capital Formation
(lnCEXPAGt) = Log of Capital Expenditure on Agriculture
(lnTPFCt) = Log of Total Production Food Crops
(lnTPCCt) = Log of Total Product Cash Crops
t = 1974/75 to 2020/21

Here, β0 is intercepted. β1, β2, β3, and β4 are the coefficients and E_tis the error term. Using equation (2), we examine the connection between the contribution of expenditure to the agricultural growth of Nepal. The available data was converted into real terms by this researcher and then entered into the model.

Results and Discussion

Unit Root Test

Before performing a regression analysis, each time series' data must be stationary. The regression findings won't be accurate otherwise. According to the test data, level form series are false from the unit root. As a result, in the beginning, different data are used for unit root testing. The findings demonstrate that all series are integrated of orders one and that the level forms of data at first difference are entirely free of unit roots.

Table 2 At Level

Regressors		**LNRGDP**			**LNCAPE**		
		AG	**LNALF**	**LNGFCF**	**XPAG**	**LNTPFC**	**LNTPCC**
With Constant	t-Statistic	0.1752	-1.3620	-0.6039	-1.7185	-1.6411	-1.8699
	Prob.	0.9673	0.5904	0.8580	0.4141	0.4520	0.3424
With Constant & Trend	t-Statistic	-1.8285	-1.4851	-1.7452	-2.2444	-4.3829**	-0.9161
	Prob.	0.6710	0.8173	0.7111	0.4526	0.0066	0.9436
Without Constant & Trend	t-Statistic	2.3811	-2.6196**	8.9572	0.1600	3.1171	1.2225
	Prob.	0.9950	0.0102	1.0000	0.7269	0.9992	0.9406
At First Difference							
		d(LNRGDPAG)	**d(LNALF)**	**d(LNGFCF)**	**d(LNCAPEXPAG)**	**d(LNTPFC)**	**d(LNTPCC)**
With Constant	t-Statistic	-6.2062***	-6.2003***	-6.3134***	-6.4155***	-9.0580***	-5.4635***
	Prob.	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
With Constant & Trend	t-Statistic	-6.2331***	-6.3001***	-6.2020***	-6.3396***	-9.0157***	-5.7549***
	Prob.	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
Without Constant & Trend	t-Statistic	-5.4502***	-5.5200***	-1.1284	-6.4433***	-7.5825***	-5.3239***
	Prob.	0.0000	0.0000	0.2307	0.0000	0.0000	0.0000

Notes: (*) Significant at 10%; (**) Significant at 5%; (***) Significant at 1% and (no) Not Significant

Lag Length based on AIC

Table 2 shows the unit root's findings, which is essential for the conformation of stationary data. The log agriculture labor force and log of total product food crops are stationary at a level. However, the log of real agriculture gross domestic product, the log of gross fixed capital formation, the log capital expenditure in agriculture, and the log of total product cash crops are stationary at first difference.

Table 3 Selected Model: ARDL (3, 3, 4, 0, 3, 2)

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.***
D(LNRGDPAG(-1))	0.031784	0.102279	0.310761	0.7609
D(LNRGDPAG(-2))	0.062106	0.097657	0.635960	0.5358
D(LNRGDPAG(-3))	0.858763	0.367327	2.337873	0.0360
LNALF	-0.089172	0.089069	-1.001151	0.3350
LNALF(-1)	0.363993	0.109058	3.337595	0.0053
LNALF(-2)	0.227679	0.109623	2.076934	0.0582
LNALF(-3)	-0.359063	0.094613	-3.795055	0.0022

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
D(LNGFCF)	0.466853	0.172739	2.702650	0.0181
D(LNGFCF(-1))	-0.519713	0.227556	-2.283891	0.0398
D(LNGFCF(-2))	0.499472	0.202648	2.464725	0.0284
D(LNGFCF(-3))	0.444984	0.183046	2.430988	0.0303
D(LNGFCF(-4))	-0.350707	0.180299	-1.945148	0.0737
D(LNCAPEXPAG)	0.102277	0.013404	7.630224	0.0000
LNTPFC	1.279483	0.214206	5.973149	0.0000
LNTPFC(-1)	-0.028637	0.252062	-0.113612	0.9113
LNTPFC(-2)	-1.089820	0.246067	-4.428950	0.0007
LNTPFC(-3)	-0.354288	0.244960	-1.446310	0.1718
D(LNTPCC)	0.943190	0.337035	2.798490	0.0151
D(LNTPCC(-1))	-0.253616	0.098699	-2.569584	0.0233
D(LNTPCC(-2))	0.219577	0.092024	2.386085	0.0329
C	1.580261	1.619429	0.975813	0.3470
R-squared	0.934199	F-statistic	9.228297	
Adjusted R-squared	0.832967	Prob (F-statistic)	0.000094	

Table 3 shows the results of the ARDL model. The variables D(LNRGDPAG(-3)), LNALF(-1), LNALF(-2), D(LNGFCF), D(LNGFCF(-2)), D(LNGFCF(-3)), D(LNCAPEXPAG), LNTPFC, D(LNTPCC)and D(LNTPCC(-2)) are significant with one per cent with the coefficient 0.858763, 0.363993, 0.227679, 0.466853, 0.499472, 0.444984, 0.102277, 1.279483, 0.943190 and 0.219577 respectively. However, LNALF (-3) (LNGFCF (-1)) D (LNGFCF (-4)) LNTPFC (-2) and D(LNTPCC(-1)) are significant at one per cent with a negative coefficient -0.359063, -0.519713, -0.350707, -1.089820, and -0.253616 respectively.

The one per cent increase in the independent variable, i.e. D (LNRGDPAG (-3)), leads to increase economic growth of 0.858763 per cent. Similarly, the one per cent increase in the independent variable, i.e. LNALF (-1), leads to increase economic growth of 0.363993 per cent. In the same way, the one per cent increase in the independent variable, i.e. LNALF (-2), leads to increase economic growth of 0.227679 per cent. Furthermore, the one per cent increase in the independent variable i.e. D (LNGFCF), leads to an increase in the economic growth of, 0.466853 per cent. Besides, the one per cent increase in the independent variable, i.e. D (LNTPCC), increases the economic expansion that 0.943190 per cent. Moreover, the one per cent increase in independent variable i.e. D (LNTPCC (-2)) leads a faster rate of economic growth 0.219577 per cent.

The value of R^2 is 0.934199, which means the independent variable of ARDL is explained to the dependent variable under the study. Because the level of R2 will be higher and can never be lower (Dougherty, 2011). Moreover, the probability F statistics is 0.000094, showing the long-term association between independent and dependent variables under study. Khan et al. (2020) found agriculture has long-term causal connections with business, services, and overall economic expansion. Moreover, (Wagle, 2016) confirms that expenditure on the agriculture sector causes Nepal's economic growth.

The agricultural labor force has a positive association with agricultural growth. Similarly, Gross fixed capital formation has a positive combination with agriculture growth. Moreover, Capital expenditure on agriculture and cash crops has a positive association with agricultural growth in Nepal.

Bound Test

The table below contains the results of the bound test.

Table 4

F-Bounds Test		Null Hypothesis: No levels of relationship		
Test Statistic	Value	Significant	I(0)	I(1)
			Asymptotic:n = 1000	
F-statistic	14.33455	10%	2.08	3
k	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15

Table 4 shows the bound test results, which show the model's calculated F-statistics is higher (14.33455) than the upper bounds (critical value), even at a 1% significance level. As a result, the null hypothesis of no co-integration is rejected, indicating that the variables under consideration have a long-term relationship.

Long-run relationship with exogenous variables

Table 5 Long-run relationship

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNALF	3.029538	25.15829	0.120419	0.9060
D(LNGFCF)	11.42412	92.69690	0.123242	0.9038
D(LNCAPEXPAG)	2.160198	17.40398	0.124121	0.9031
LNTPFC	-4.081905	34.90080	-0.116957	0.9087
D(LNTPCC)	19.20219	159.8368	0.120136	0.9062
C	33.37673	286.4956	0.116500	0.9090

Table 5 shows the outcomes of the long-term interaction between the dependent and independent variables. LNALF, D(LNGFCF), D(LNCAPEXPAG), and D(LNTPCC) have the coefficients of 3.029538, 11.42412, 2.160198, -4.081905 and 19.20219 and are not statistically significant under the study. Long-term evidence indicates a connection between the elasticity of food crop production and the agricultural growth of Nepal. It is because a food crop that has not been a priority is only the means to subsistence crops in Nepal. Neither food crop is sufficient for the appetite or export. Moreover, the flexibility of the agricultural work force, in the long run, elasticity of gross fixed capital formation, elasticity of capital expenditure, and elasticity of food crops have not made any significant contribution to the agricultural growth of Nepal.

Error Correction Model

The divergence from a long-run equilibrium between the independent variables is examined and corrected using ECM. The following table shows the result of the Error Correction Model in the long run.

Table 6 Error correction model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNRGDPAG(-1), 2)	-0.920870	0.072347	-12.72859	0.0000
D(LNRGDPAG(-2), 2)	-0.858763	0.092916	-9.242382	0.0000

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNALF)	-0.089172	0.064189	-1.389217	0.1881
D(LNALF(-1))	0.131384	0.064347	2.041789	0.0620
D(LNALF(-2))	0.359063	0.064955	5.527894	0.0001
D(LNGFCF, 2)	0.466853	0.129171	3.614225	0.0031
D(LNGFCF(-1), 2)	-0.593748	0.193740	-3.064667	0.0090
D(LNGFCF(-2), 2)	-0.094276	0.196100	-0.480755	0.6387
D(LNGFCF(-3), 2)	0.350707	0.133844	2.620262	0.0212
D(LNTPFC)	1.279483	0.137858	9.281146	0.0000
D(LNTPFC(-1))	1.444109	0.161900	8.919730	0.0000
D(LNTPFC(-2))	0.354288	0.154554	2.292326	0.0392
D(LNTPCC, 2)	0.943190	0.085687	11.00738	0.0000
D(LNTPCC(-1), 2)	-0.219577	0.058763	-3.736627	0.0025
CointEq(-1)*	-0.047346	0.003910	-12.11006	0.0000

Table 6 shows the outcomes of the error correction model. The variables are D(LNRGDPAG(-1), 2), D(LNRGDPAG(-2), 2), D(LNALF(-1)), D(LNALF(-2)), D(LNGFCF, 2), D(LNGFCF(-1), 2), D(LNGFCF(-3), 2), D(LNTPFC), D(LNTPFC(-1)), D(LNTPFC(-2)), D(LNTPCC, 2), D(LNTPCC(-1), 2). At a one per cent level of significance, they are significant with -0.920870, 0.131384, 0.359063, 0.466853, -0.593748, 0.350707, 1.279483, 1.444109, 0.354288, 0.943190 and -0.219577 coefficient respectively.

The Coint Eq (-1) has a negative coefficient of -0.047346 with a one per cent level of significance. In the long run, the deviation will be corrected with one year lag with a speed of adjustment of 0.07 per cent. In other words, the disequilibrium will be corrected in one lag period with a speed of adjustment of 0.07 per cent. The study found that the selected independent variables will converge at the speed of 0.07 per cent to get the equilibrium in an economy. A decline of 0.92 percent results from the real gross domestic product on agriculture's first difference log increasing by one per cent over the one-lag period and log of real gross domestic product on agriculture. Similarly, the one per cent increase in the first difference of log of real gross domestic product on agriculture in the lag period of two indicates a decrease of 0.85 per cent log of real gross domestic product on agriculture. In the same way, the one per cent increase in the first difference log of gross fixed capital formation in the lag period of one leads to a decrease of 0.59 per cent log of real gross domestic product on agriculture. Moreover, the one per cent increases in the first difference log of total output on cash crops in the lag period of one leads to a decrease of 0.21 per cent log of real gross domestic agricultural production.

However, the one per cent increases in the first difference log of the agriculture labor force in the lag period of one leads to a 0.13 per cent log of real gross domestic product on agriculture. In addition to it, the one per cent increase in the first difference log of the agriculture labor force in the lag period of two leads to an increase of 0.35 per cent log of real gross domestic product on agriculture. Similarly, the one per cent increase in the first difference log of gross fixed capital formation leads to an increase of 0.46 per cent log of real gross domestic agricultural production. Moreover, the one per cent increase in the first difference log of gross fixed capital formation in the lag period of three directs to an increase of 0.35 per cent log of real gross domestic agricultural production in Nepal.

Similarly, the one per cent increase in the first difference log of total production on food crops leads to an increase of 1.27 per cent log of real gross domestic agricultural production. In addition, the one per cent increases in the first difference log of total production on food crops in the lag period of one leads

to an increase of 1.44 per cent log of real gross domestic agricultural production in Nepal. Moreover, the one per cent in the first difference log of total output on food crops in the lag period of two expands to an increase of 0.35 per cent log of real gross domestic agricultural production. And the one per cent increase in the first difference log of total cash crop production leads to a 0.94 per cent log of real gross domestic product on agriculture in Nepal.

Stability Diagnostic

ARDL CUSUM and CUSUM square are presented below:

Figure 1 CUSUM

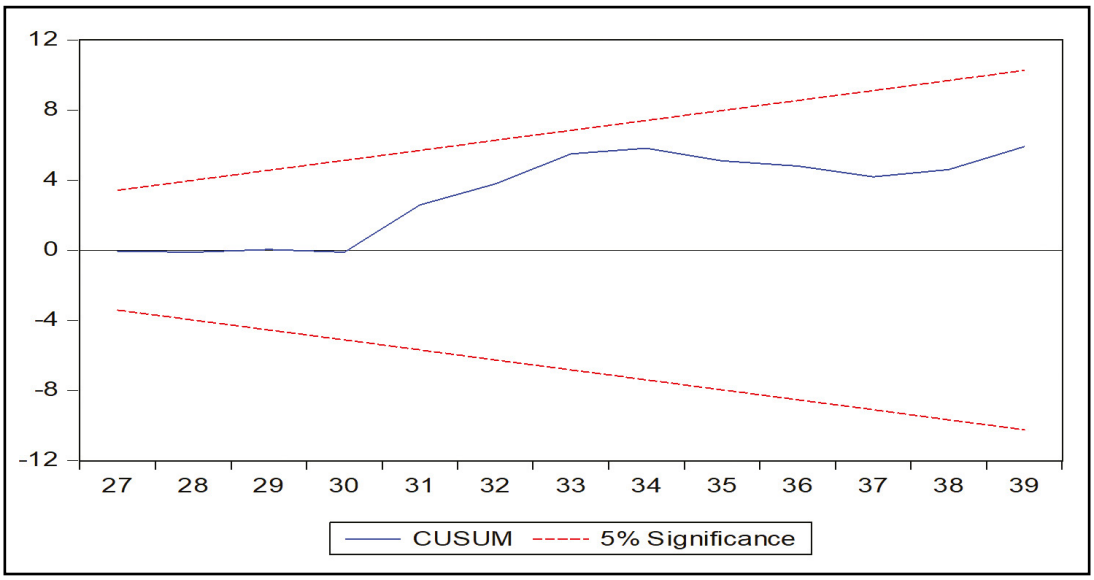

Figure 1 shows the CUSUM statistics graphic for LNNGDP within the five per cent significance level's critical lines. The CUSUM plot is within the critical limit, indicating that the model one is stable and the stability of the log of agriculture real gross domestic product.

Figure 2 CUSUM SQ

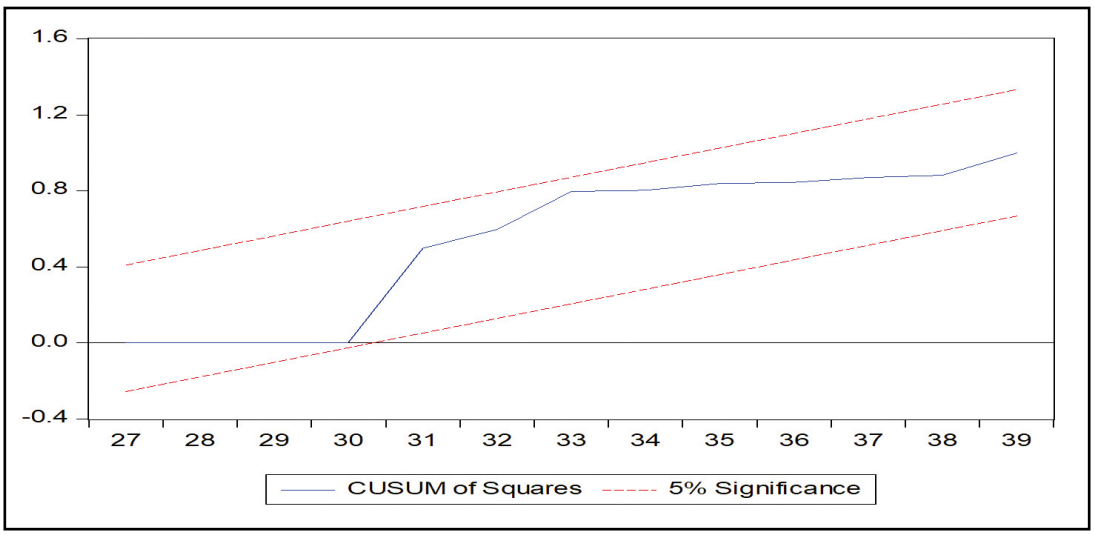

Figure 2 CUSUMSQ values for LNNGDP are plotted within the crucial lines at a five per cent significance level. The plot of CUSUMSQ lies within the critical limit implying the stability of model one and the stability of the log of agriculture real gross domestic product.

Serial correlation LM test

One of the properties of classical regression is that the dependent variables must not be correlated if correlated, then the classical assumption is violated, and spurious regression occurs under study. The null hypothesis under study is there is no correlation.

Table 7 Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.422782	Prob. F(2,11)	0.6654
Obs*R-squared	2.426999	Prob. Chi-Square(2)	0.2972

Table 7 shows the results of the serial correlation; especially the Probability of Chi-square (2) is 0.2972, which is greater than five per cent. The results mean that accepting the null hypothesis, which means no serial correlation, is under study.

Heterostekesdacity test

The Heterostekesdacity assumes that the model's error term has constant variance and is mutually uncorrelated. The result of the Heterostekesdacity is presented as follows. The null hypothesis is there is no Heterostekesdacity under study

Table 8 Breusch-Pagan-Godfrey Test for Heteroskedasticity

F-statistic	1.602619	Prob. F(20,13)	0.1929
Obs*R-squared	24.18920	Prob. Chi-Square(20)	0.2342
Scaled explained SS	2.467772	Prob. Chi-Square(20)	1.0000

Table 8 shows that the model has no Heterostekesdacity meaning null hypothesis is accepted. The model has no multicollinearity since the variance influencing factor is less than ten per cent. The result shows that the Prob. The Chi-Square (24) value of statistics is greater than 5 per cent, which is 02342. This means there is no multicollinearity under the study.

Normality Test

In addition to the graphical evaluation of normalcy, there are normality tests. The Jarque-Bera test is one of the tests used to gauge normalcy.

Figure 3 Normality test

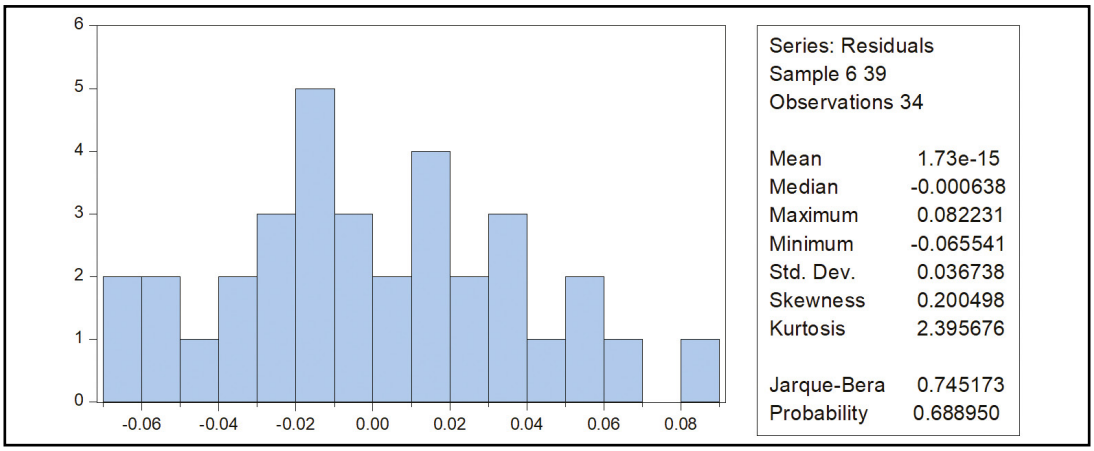

Figure 3 shows the results of the normality test. The probability of Jarque -Beas is greater than 5 Per cent. This means the distribution of the data is normal. In other words, the figure itself is in the bell curve shape in nature. Thus the data is normally distributed.

The one per cent increase in capital expenditure on agriculture increases the rate of economic growth of 0.102277 per cent. The one per cent increase in the third lag of agriculture GDP itself leads to an increase in agriculture economic growth of 0.858763 per cent. Similarly, the one per cent increase in the lag of the agricultural labor force results in an acceleration of the economic growth of 0.363993 per cent. Furthermore, the one per cent increase in gross fixed capital formation leads to a rise in agriculture's economic growth rate of 0.466853 per cent. Moreover, the one per cent increases in the first difference of log real gross domestic product with three lag leads to expansion the economic growth of 0.858763 per cent. Similarly, the one per cent increase log of the agriculture labor force with two lag increases the economic expansion that 0.227679 per cent. Besides, the one per cent increases in the first log of log of total product cash crops increased economic growth is the result of 0.943190 per cent. Moreover, the one per cent increase in the first difference of total product cash crops with two lags increases the economic growth of 0.219577 per cent.

In the long run, the selected variables do not have any significant relation with agricultural growth, suggesting that the labor for has not been engaged in agricultural production, which is a matter the seriousness in an agrarian economy like ours. Moreover, gross fixed capital formation has not provided any noteworthy change in the agricultural economy. The question might be the usefulness of agricultural subsidies provided each year by the government the Nepalese farmers. It sings misuse of agriculture subsidies. Moreover, cash crops and foods, which are Nepal's major crops, do not support growth in the long run, meaning we lack the production of agricultural output. These suggest that capital formation, education attainment, and agriculture expenditure could not contribute to the agricultural growth in Nepal. As Byerlee et al. (2009) found, the function of agriculture needs to be carefully prioritized.

The main empirical results prove the positive relationship between labor force and agriculture growth. The results are consistent with (Wijaya et al., 2021), (Mahmud & Rashid, 2006), (Haque et al., 2019), and (Yousuf et al., 2019). In the same way, the study found positive relationship exists between gross fixed capital formation and growth. The results confirm the arguments of (Ahmed & Acet, 2020), (Abina & Boluwatife, 2021), and (Haque et al., 2019). Moreover, the study finds a agriculture growth and spending have a favorable correlation in Nepal. These findings confirm that (Shik, 2020) agricultural budget positively affects agricultural development. It is not the sole element influencing the expansion of agriculture. Moreover, Chandio et al. (2016) found that government spending on agriculture and agricultural output contribute to Pakistan's agricultural and economic prosperity. However, Matthew and Mordecai (2016) found public agricultural expenditure significantly negatively impacts agricultural output. Similarly, result of the study suggests cash crops have a strong connection to agricultural expansion (Asaleye et al., 2020). They found funding for a cash crop has a positive impact on agricultural output. The production of cash crops could generate money immediately by exporting the output. Similarly, Lyimo and Losaru (2022) found that Tanzania's economic expansion is positively correlated with the export of agricultural cash crops. Moreover, Fuglie (2010), and Praburaj et al. (2018) found that increased agricultural output and productivity contribute substantially to the overall economic growth of the nation .

Conclusions

The investigation regarding the contribution of agriculture labor force, gross fixed capital formation, and agriculture expenditure cash crops jointly make a big difference because of the goodness of fitting. The new independent variables are the agriculture labor force, gross fixed capital formation, and cash crops production. The study concludes a noteworthy connection between government capital agriculture expenditure and the real agriculture growth of Nepal. Moreover, the agricultural labor force

and cash crops production also significantly contribute to agricultural expansion in the near future. Government spending in Nepal has produced a number of insightful findings with practical application. The estimation of the ARDL model initiates the econometric analysis. From both theoretical and economic angles, the results are tenable and justified. The government of Nepal therefore, needs to increase government expenditure to increase the agriculture growth rate in Nepal. As Adhikari (2015) stresses, agriculture government spending is essential for the GDP, which becomes the backbone for the expansion of Nepal's economy. Methodologically, in this paper, Auto Regressive Distributed Lag (ARDL) Model, followed by a bound test, has been used. Thus, the conclusions reached by this study might not agree with those reached using other approaches. Second, the dynamic study analysis is best performed with quarterly or monthly data. Nevertheless, labour force, more precisely, the agricultural labor force is calculated via the population growth rate of each successive year in Nepal. The study's third limitation is that it covers only the data from 1974/75 to 2020/21.

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