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Contribution of the Agricultural Sector in the Economic Development in Nepal

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Abstract

This study examines the contribution of agricultural sector in the economic development of Nepal. Economic development is the dependent variable. The selected independent variables are agricultural sector contribution, agricultural sector to gross value added, agricultural employment, and agricultural productivity. The study is based on secondary data. The total number of observations for the study consists of 60 for the study period of 2010/11 to 2021/22. The data were collected from ministry of finance and economic survey of Nepal. The correlation coefficients and regression models are estimated to test the significance and importance of contribution of agricultural sector in the economic development of Nepal.

The study showed a positive impact of agricultural sector contribution on economic development. It indicates that higher the agricultural sector contribution, higher would be the economic development. Similarly, the study showed a positive impact of agricultural sector to gross value added on economic development. It indicates that higher the agriculture sector to gross value added, higher would be the economic development. Likewise, the study showed a positive impact of agricultural employment on economic development. It indicates that increase in agricultural employment leads to increase in economic development. Further, the study also showed a positive impact of agricultural productivity on economic development. It indicates that increase in agricultural productivity leads to increase in economic development.

Keywords: agricultural sector contribution, agricultural sector to gross value added, agricultural employment, agricultural productivity, economic development

1. Introduction

Agriculture is a major source of food, clothing, and shelter, but the literature has reported that in spite of Nigeria's rich agricultural resource endowment, there has been a gradual decline in agriculture's contributions to the nation's economy (Manyong *et al.*, 2005). Economic growth is defined as the achievement of yearly increases in both the total and per capita output of goods and services in a country (Akpakpan, 1987). Economic development is defined quantitatively as a process of improvement in the general welfare of the entire society usually manifested in desirable changes in various aspects of the society such as; reduction in the level of unemployment, regional inequalities, absolute poverty; rise in real output of goods and services and improvement in the technique of production; improvement in literacy, housing condition, health and government services; improvement in the level of social and political consciousness of the people; greater ability to draw on local resources both human and materials to meet local needs(self-reliance) and a reduction in pollution and or environmental degradation (Akpakpan, 1999). According to Foster and Rosenzweig (2010), there are two major drivers of successful agricultural technology in

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developing countries: first one is the availability and affordability of technologies; and second one is farmer expectations that adoption will remain profitable both which determine the extent to which farmers are risk averse. There are number of factors which drive the above expectations, ranging from availability and size of land, family labor, prices and profitability of agricultural enterprises. De Janvry *et al.* (2011) argued that the availability of land helps to reduce the liquidity constraints faced by households and also reduces risk aversion. On the other hand, ownership of large tracts of land can facilitate experimentation with new agricultural technologies, and also determine the pace of adoption as large land owners are more likely to be the early adopters.

Izuchukwu (2011) examined the analysis of the contribution of the agricultural sector on the Nigerian economic development. The study revealed that there is a positive relationship between Gross Domestic Product (GDP), and the three independent variables (Domestic Saving, Government Expenditure on Agriculture and Foreign Direct Investment on Agriculture). Likewise, Odetola and Etumnu (2013) assessed the contribution of agriculture to economic growth in Nigeria. The study concluded that the agriculture sector has contributed positively and consistently to economic growth in Nigeria, reaffirming the sector's importance in the economy and the crop production sub sector contributes the most to agriculture sector growth and that growth in the agriculture sector is overly dependent on growth of the crop production subsector. In addition, Omorogiuwa *et al.* (2014) observed the role of agriculture in the economic development of Nigeria. The study showed that in-depth research on the development of the agricultural sector is essential to the progress of the country. Further, Olajide *et al.* (2012) analyzed the agriculture resource and economic growth in Nigeria. The study showed a positive impact on gross domestic product (GDP) and agricultural output. Likewise, Raza *et al.* (2012) investigated the role of agriculture in economic growth of Pakistan. The study showed that there is a significant role of agriculture sub-sectors towards the economic growth. Similarly, Bint *et al.* (2021) observed the contribution of the agriculture sector in economic growth: An empirical analysis. The study concluded that real agricultural value added has a significant positive impact on real GDP per capita in the long-run. Likewise, Okyere and Jilu (2020) investigated the impact of export and import to the economic growth of Ghana. The study showed that there is no significant causal relationship between imports in international trade and GDP growth. Similarly, Obisike *et al.* (2020) assessed the impact of international trade on Nigerian economic growth: Evidence from oil terms of trade. The study revealed that the international trade both in oil and non-oil are vital for economic growth. Likewise, Fullerton *et al.* (2012) investigated the nexus between exports, imports and economic growth. The study found that imports play a more critical role than exports do for economic growth. Further, Mayasa *et al.* (2014) analyzed the effect of trade liberalization on economic growth. The study showed that trade openness has a positive and significant impact on economic growth.

In the context of Nepal, Maharjan (2020) analyzed the climate risk and food security: An evidence from Nepal. The study found that many farmers in the country struggle to secure funding to invest in modern technology, inputs, and other agricultural resources due to lack of access to finance and credit has resulted in low productivity, poor crop yields, and limited income for farmers. In addition, Khanal *et al.* (2020) examined the legislative and institutional arrangements made for agricultural development in Nepal. The study found that strong political commitment and active involvement of stakeholders are needed to redesign

programs and activities as per the restructuring of the governance systems federal, provincial and local levels for a true agricultural revolution to occur. Similarly, Pradhan (2015) analyzed the need for policies and programs. The study found that agricultural transformation is essential for reducing poverty and achieving economic growth in Nepal. Likewise, Gautam (2020) examined the agricultural policy and rural development in Nepal: A review. The study found that there is a positive relationship between technological adoption and agricultural transformation. Further, Singh (2019) examined the progress and challenges of agricultural transformation in Nepal. The study found a positive relationship between government investments, land and property rights that more funding for agriculture is required, along with improved institutions, laws, and access to financing and markets.

The above discussion shows that empirical evidence vary greatly across the studies on the contribution of agricultural sector on the economic development. Though there are above mentioned empirical evidence in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The major objective of the study is to examine the contribution of agricultural sector on the economic development of Nepal. Specifically, it examines the relationship of agricultural sector contribution, agricultural sector to gross value added, agricultural employment, and agricultural productivity with the economic development of Nepal.

The remainder of this study is organized as follows. Section two describes the sample, data and methodology. Section three presents the empirical results, and the final section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from ministry of finance and economic survey report from 2010/11 to 2021/22, leading to a total of 60 observations. This study is based on descriptive as well as causal comparative research designs.

Thus, the study is based on the 60 observations.

The model

The model used in this study assumes that economic development depends upon contribution of agricultural sector. The dependent variable selected for the study is economic development. Similarly, the selected independent variables are agricultural sector contribution, agricultural sector to gross value added, agricultural employment, and agricultural productivity. Therefore, the model takes the following form:

$ED = f(\text{agricultural sector contribution, agricultural sector to gross value added, agricultural employment, and agricultural productivity})$

More specifically, the given model has been segmented into the following models:

$$ED_{it} = \beta_0 + \beta_1 ASC_{it} + \beta_2 ASGVA_{it} + \beta_3 AE_{it} + \beta_4 AP_{it} + e_{it}$$

Where,

ED_{it} = Economic development for a particular time period.

ASC_{it} = Agricultural sector contribution to the economy.

$ASGVA_{it}$ = Agricultural sector's contribution to gross value added.

AE_{it} = Agricultural employment.

AP_{it} = Agricultural productivity.

The following section describes the independent variables used in this study along with the hypothesis formulation.

Agricultural sector contribution

Aattar and Elouardirhi (2022) analyzed the contribution of the agricultural sector to economic growth. The study found that the agricultural sector has a positive and significant impact on the growth rate of real GDP per capita in the short and long run. Similarly, Mucavele (2013) assessed the real share of agriculture in economic growth and reduction of poverty in 3 countries including Malawi, Mozambique and Zambia. The study revealed that in all 3 countries, agriculture has an impressive role in economic growth and poverty reduction. In addition, Olajide *et al.* (2012) analyzed the relation of agriculture sources and economic growth in Nigeria in the period of 1970 to 2010 using the least squares method. The study found that the relation between gross domestic production and the agriculture sector is positive. Based on it, this study develops the following hypothesis:

H_1 : There is a positive relationship between agricultural sector contribution and economic development.

Agriculture sector to gross value added

The Agriculture Sector's Gross Value Added (GVA) is a measure that quantifies the contribution of the agriculture industry to the overall economy of a country. Mehnatfar *et al.* (2015) analyzed the impact of value-added economic sectors on economic growth in the fourth development plan with emphasis on the agriculture sector by using panel data methods in the period 2005 to 2009. The study revealed that growth of the agriculture sector in provinces of the country has a positive and significant effect on GDP growth. Likewise, Ceylan and Ozkan (2013) investigated the relationship between agricultural value added and economic growth in the European Union accession process. The study showed that the agriculture sector to gross value added has a positive impact on economic development. Based on it, this study develops the following hypothesis:

H_2 : There is a positive relationship between agriculture sector to gross value added and economic development.

Agricultural employment

Agricultural employment refers to the number of people who are engaged in agricultural activities, including farming, forestry, fishing, and related occupations. The high ratio of employment of the agriculture sector in undeveloped countries doesn't show good productivity but reminds us of its importance in the present economic situation (Esfandiyari and Tarahomi, 2009). Chinsinga and Chasukwa (2018) observed the effects of agricultural policy, employment opportunities and social mobility in rural Malawi. The study found that even though agricultural production is the main occupation in Malawi, young people do

not value agriculture as a means of upward social mobility. Likewise, Diao *et al.* (2019) examined the effect of various channels of growth on the decrease in poverty and the overall growth rate in six low-income countries of Africa. The study revealed that industrial growth is less effective in reducing poverty than agricultural growth because a high percentage of the population (about 70%) live in rural areas. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between agricultural employment and economic development.

Agricultural productivity

Armand *et al.* (2013) analyzed the effect of export of agriculture products on economic growth of Cameron in the period of 1975 to 2009 using the VECM model. The study concluded that export of agriculture products has a significant positive effect on economic growth of Cameron in the studied period. Likewise, Bezhani (2013) investigated the economic effect of agriculture products on the economic growth of Albania. The study revealed that improving the situation of agriculture products and increasing the amount of production, has a positive effect on Albania's exports. Moreover, Muhammad and Atte (2006) examined agricultural productivity and its determinants in Nigeria. The study revealed that the major factors affecting agricultural productivity in Nigeria are GDP growth rate, population growth rate and consumer price index. Similarly, Omorogiuwa *et al.* (2014) analyzed the historical and current perspective about the development of agriculture in Nigeria, in light of its productivity. The study found that in-depth research on the development of the agricultural sector is essential to its productivity. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship between agricultural productivity and economic development.

3. Results and discussion

Descriptive statistics

Table 1 presents the descriptive statistics for the Nepalese economy development used in this study during the period 2010/11 to 2021/22.

Table 1

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables for the study period of 2010/11 to 2021/22. The dependent variable is ED (Economic development). The independent variables are ASC (Agriculture sector contribution), ASGVA (Agricultural sector's contribution to gross value added), AE (Agricultural employment), and AP (Agricultural productivity).

Variables	Minimum	Maximum	Mean	S.D
ED	0.43	8.98	4.84	2.34
ASC	21.58	34.00	26.94	4.75
ASGVA	23.90	37.40	28.57	3.90
AE	62.26	71.00	65.11	2.62
AP	5.35	11.55	7.92	2.01

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients is computed, and the results are presented in Table 2.

Table 3

Pearson's correlation coefficients matrix

This table shows the correlation coefficients of dependent and independent variables from the study period of 2010/11 to 2021/22. The dependent variable is ED (Economic development). The independent variables are ASC (Agriculture sector contribution), ASGVA (Agricultural sector's contribution to gross value added), AE (Agricultural employment), and AP (Agricultural productivity).

Variables	ED	ASC	ASGVA	AE	AP
ED	1				
ASC	0.422	1			
ASGVA	0.128	0.502	1		
AE	0.268	0.802**	0.653*	1	
AP	0.186	0.867**	0.118	0.607*	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 2 shows that there is a positive relationship between earnings per share and stock price. It indicates that higher the earnings per share, higher would be the stock price. Similarly, there is a positive relationship between dividend per share and stock price. It indicates that higher the dividend per share, higher would be the stock price. Furthermore, there is a positive relationship between price to earnings ratio and stock price. It indicates that the increase in price to earnings ratio leads to an increase in stock price. Moreover, there is a positive relationship between return on equity and stock price. It indicates that the increase in return on equity leads to an increase in stock price. In contrast, the size of the firm has a negative relationship with stock price. It shows that higher the size of the firm, lower would be the stock price.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 3. More specifically, it shows the regression results of agriculture sector contribution, agricultural sector's contribution to gross value added, agricultural employment, and agricultural productivity with economic development.

Table 3

Estimated regression results of agriculture sector contribution, agricultural sector's contribution to gross value added, agricultural employment, and agricultural productivity on economic development

The results are based on time series data with 60 observations for the period of 2010/11 to 2021/212 by using the linear regression model and the model is $ED_{it} = \beta_0 + \beta_1 ASC_{it} + \beta_2 ASGVA_{it} + \beta_3 AE_{it} + \beta_4 AP_{it} + e_{it}$ where the dependent variable is ED (Economic development). The independent variables are ASC (Agriculture sector contribution), ASGVA (Agricultural sector's contribution to gross value added), AE (Agricultural employment), and AP (Agricultural productivity).

Model	Intercept	Regression coefficients of				Adj. R _{bar} ²	SEE	F-value
		ASC	ASGVA	AE	AP			
1	10.452 (2.708)*	0.208 (1.474)				0.096	2.224	2.171
2	7.040 (1.299)		0.208 (1.474)			0.082	2.433	0.167
3	20.459 (1.153)			0.240 (0.881)		0.021	2.363	0.776
4	20.459 (1.153)				0.217 (0.597)	0.062	2.410	0.357
5	20.459 (1.153)	0.413 (2.736)**	0.208 (1.474)			0.784	2.911	2.684
6	6.746 (0.619)	0.036 (6.532)**	1.869 (7.593)**	2.203 (3.722)**		0.783	3.786	0.097
7	2.895 (6.156)**	1.440 (5.109)**	1.849 (7.560)**	2.021 (2.565)**	0.217 (0.597)	0.784	9.599	3.000

Notes:

- i. Figures in parenthesis are t-values.
- ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- iii. Economic development is the dependent variable.

Table 3 shows that the beta coefficients for agricultural sector contribution are positive with economic development. It indicates that agricultural sector contribution has a positive impact on economic development. This finding is similar to the findings of Aattar and Elouardirhi (2022). Similarly, the beta coefficients for agriculture sector to gross value added are positive with economic development. It indicates that agriculture sector to gross value added has a positive impact on economic development. This finding is consistent with the findings of Ceylan and Ozkan (2013). Likewise, the beta coefficients for agricultural employment are positive with economic development. It indicates that agricultural employment has a positive impact on economic development. This finding is similar to the findings of Diao *et al.* (2019). Moreover, the beta coefficients for agricultural productivity are positive with economic development. It indicates that agricultural productivity has a positive impact on economic development. This finding is similar to the findings of Muhammad and Atte (2006).

4. Summary and conclusion

Agriculture is the bedrock of economic growth, development and poverty eradication in the developing countries. The contribution of the agricultural sector to economic development is a multifaceted and crucial aspect of a nation’s overall progress. This study showed that in-depth research on the development of the agricultural sector is essential to the progress of the country.

This study attempts to examine the contribution of the agricultural sector on the economic development of Nepal. The study is based on secondary data. The total number of observations for the study consists of 60 from the study period of 2010/11 to 2021/22.

The major conclusion of this study is that agricultural sector contribution, agricultural sector to gross value added, agricultural employment, and agricultural productivity have positive impact on economic development. The study also concludes that agricultural employment followed by agricultural productivity is the most influencing factor that explains the changes in the economic development of the Nepal.

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