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Assessing the Contribution of Agriculture for Boosting Nepalese Economy

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Abstract

Agriculture sector is the main components of economic development of developing countries like Nepal. This sector contributes boosting economy in terms of GDP, employment and food security, as more than 60% of Nepalese residents chose agriculture as their primary source of income. The increase in output and productivity in this sector is crucial for reducing poverty through long-term, high-growth economic growth. Increased agricultural production and output are important contributors to the country's overall economic development. This study aims to look at how the agriculture sector contributes to the Nepalese economy's growth. Using data collected over a 20-year period, a simple linear regression model has applied to determine the economic impact of farm sector production on real GDP. The study finds a positive impact of agriculture sector on real GDP and other sectors. Though, agriculture sector has been facing diversified challenges improving its production in Nepal.

Keywords: Agriculture, Contribution, Impact, Economic growth, Descriptive statistics.

Introduction

The agriculture sector is a major component of national economy of Nepal. This industry contributes to the economic success of rich countries like the United States and is critical to the growth of developing countries like Nepal. This sector contributes to a country's economic development by providing non-agricultural industries with food and raw resources, hence creating demand for goods produced in those sectors. According to the dual economic model, the agricultural sector was viewed as a low-productivity area from which labor and materials might be extracted and used in the modern high-productivity industrial sector (Lewis, 1955).

Agriculture sector's contributions differ in the three rural worlds. The way of agriculture works for development varies across countries depending on how they rely on agriculture as a source of growth and the instrument for poverty reduction. The agriculture is assumed to a major source of growth which accounting for 32 percent GDP growth on average mainly agriculture is a large share of GDP. The agriculture is a source of livelihoods for around 86 percent of rural people (WB, 2008).

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Agriculture, which employs more people than any other sector, has long been recognized as the backbone of Nepal's economy. According to the findings, in addition to having a direct impact on farmer income, the agriculture sector can also contribute to enhance economic development outside of agriculture, resulting in more jobs and economic growth. Increasing agricultural productivity increases farm incomes, increases food supply, lowers food prices, and creates more job opportunities (DFID, 2007). Poor rural households' increasing diversification of income sources away from their own farms, and notably away from agriculture activities, has sparked a renewed focus on agriculture (Fraser, 2009).

Gauchan (2008) stated that the agriculture sector, which accounts for more than a third of GDP and employs two-thirds of the country's workforce, is critical to every citizen's livelihood. This industry is thought to be critical in raising income, alleviating poverty, and improving Nepalese citizens' living standards. Appropriate activities and future strategic directions for enhancing the agriculture sector's performance in order to secure national food security, economic growth, and poverty reduction.

Agriculture is the mainstay of economic prosperity, contributing 27 percent to GDP and supporting the livelihoods of 60.4 percent of the people. This sector also contributes to high and inclusive economic growth by improving and transforming it in a scientific manner so that production and productivity can be increased (NPC, 2019).

Agriculture makes a significant contribution to Nepal's economy in a variety of ways. From decades to decades, this sector has been a major contributor to job creation and real GDP. Though, to yet, the position of this industry has not been modernized or marketed. The purpose of this research is to assess the agricultural sector's contribution from several angles.

Literature Review

Nepal is classified as an agro-based country, with agricultural activities remaining the primary source of employment and income for the majority of Nepalese. The agriculture industry accounts for roughly a third of total GDP. In this study, many research related materials have been analyzed in relation to the contribution and role of the agriculture sector. All of the studies emphasized the importance of agriculture in terms of employment, citizen earnings, and real GDP. Hwa (1989) used cross-section data to investigate the role of agriculture in economic growth and discovered that agricultural growth contributes to overall economic growth through its favorable impact on total factor productivity. This empirical evidence backs up the idea that agricultural and rural development should be prioritized and adequately supported as part of a larger development plan.

The agriculture industry contributes significantly to rural development, with the primary potential contributions of farming in terms of providing jobs, enterprises, and environmental services. The agriculture sector needs financial and social infrastructural support (EC, 2000).

Gauchan (2008) investigated the agricultural sector's contribution to economic growth, food security, and poverty reduction. As he stated, agriculture plays a larger role in raising income, alleviating poverty, and improving the living standards of Nepalese people. The report recommends that suitable actions and future directions be taken to improve the agricultural sector's performance in order to secure national food security, boost economic growth, and reduce poverty.

Agriculture's contribution to green growth was investigated by Blandford (2012). Agriculture's productivity rise has played a significant influence in OECD countries' economic growth, according to the research. Agriculture's rate of growth in total factor productivity outpaced that of several other industries. The implementation of a green growth plan in agriculture is fraught with difficulties. The expected increase in demand for food and agricultural raw materials as the world's population and earnings grow, placing significant pressure on limited resources. Economic progress and job creation in such industries were fueled by labor liberated from agricultural pursuits.

Praburaj (2018) found that when rural areas become more industrialized and urbanized, their per capita agricultural productivity rises, resulting in a higher demand for industrial production.

Rukundo (2019) explored the importance of agriculture in state growth from a sectoral perspective. The article concentrated on agriculture, which was thought to be a source of energy for all communities in terms of food security and an innovation hub for their chronological growth. Agriculture has been subjected to a series of adjustments and upgrades as a result of changing generations' requirements and technical advancements in order to respond to present and future trends in agriculture output and security, which includes food, health, and market exchanges.

The National Planning Commission (NPC) (2019) has stressed the importance of major investment in the agriculture sector in order for the country to become food self-sufficient and economically independent. The Agriculture Development Strategy (ADS, 2015-2035), which serves as a blueprint for the agriculture sector's overall development, and the Sustainable Development Goals (SDGs) have been used as guiding documents. To make the industry competitive, the ADS stresses commercialization, mechanization, and diversification of agricultural and livestock goods. Under the Sustainable Development Goals, the Fifteenth Plan has concentrated on mobilizing resources in agriculture to fulfill the goals of eradicating hunger, guaranteeing food security and nutrition, and promoting sustainable agriculture (SDGs).

The Indian GDP contracted by 23.9 percent but agriculture grew by 3.4 percent in the first quarter in 2020. The agriculture contributed only 15-16 percent of GDP, could not overturn contraction in other sectors, but along with rural sector, which could jump start the economy if it fixed its ills and transformed. The agriculture can do largely better if we change the way of farm, focus more on allied sectors, livestock, fisheries and forests and build strong growth links with the non-farm rural economy that along with agriculture, contributes some 46 percent of NDP (Agrawal,2020).

The World Bank (2020) remarked that agriculture can support reduce poverty, raise incomes and improve food security for 80 percent of the world's poor who stay in rural areas and work in farming.

Research Problems and Objectives

In developing countries like Nepal where the majority of people depend on agriculture for their livelihood, agriculture makes a significant contribution to the economy. Despite the fact, this sector faces a number of challenges that limit its performance, competitiveness, and contribution. The agriculture sector has been dealing with a wide range of issues caused by both internal and external sources. Internal problems are strongly tied to a company's restrictions and vulnerabilities, whereas external difficulties stem from the larger environment.

The overall objective of the study is to analyze the contributory position of agriculture sector in the economy. The specific objectives are as:

i. To analyze the trends of agriculture of Nepal.
ii. To examine the relationship between agriculture sector production and real GDP of Nepal.

Research Method and Data

This research is both descriptive and analytical so that the descriptive research design has been used to analyze the data. Different tables and diagrams have been offered as necessary in descriptive and analytical research design. The impact of the agriculture sector on real GDP has also been studied using econometric and statistical methods and models. The contribution of the agriculture sector to the economy has been examined using both public and unpublished relevant literature. The situation has examined by using data from government and non-government sectors.

The following equation has been used to estimate the impact of agriculture sector on real GDP:

The impact of agriculture sector production (ASP) on real GDP is estimated by:

$$GDP_t = \beta_0 + \beta_1 ASP_t + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (i)$$

Where, GDP is the real gross domestic product. The β_0 is constant;β_1 is coefficient parameter. The increase in agriculture sector production (ASP) contribution is expected to be increase in real GDP.

Results and Discussion

Agriculture production has been steadily expanding in recent years. In 2019/20, Nepal is expected to produce a substantial amount of food crops, accounting for roughly 45.2 percent, vegetables 16.8 percent, industrial crops 14.5 percent, cash crops 13.3 percent, and other crops 10.2 percent. Food grains, cash crops, pulses, fruits, and spices increased in production during that time, while vegetables, industrial crops, and oilseeds fell.

Industrial crops had the highest production among agricultural crops, while oilseeds had the lowest.

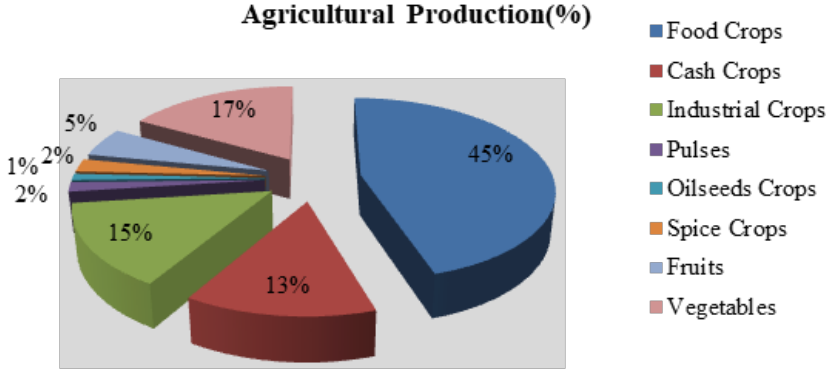
Table-1: *Production Status of Agricultural Crops*

Details	Area (Thousand in Hectare)	Production (Thousand in Metric Tons)	Change in Production (%)	Productivity (Metric Tons in Per Hectare)
Food Crops	3418.2	10992.7 (45.21%)	2.9	3.22
Cash Crops	430.7	3229.7(13.30%)	3.6	7.50
Industrial Crops	118.6	3519.0(14.47%)	-4.5	29.68
Pulses	340.7	404.2(1.66%)	5.8	1.19
Oilseeds Crops	258.1	278.3(1.14%)	-1.4	1.08
Spice Crops	70.3	550.3(2.26%)	1.3	7.83
Fruits	-	1249.7(5.14%)	6.1	-
Vegetables	-	4089.2 (16.82%)	-4.3	-
		24313.1 (100%)		

Source: *Economic Survey, 2019/20.*

Table-1 depicts the agricultural production status of Nepal. Food crops contribute the significant portion of agriculture production in Nepal.

Figure-1: ***Agricultural Production as Types of Crops***



The current state of agriculture output in Nepal is depicted in Table 1 and Figure 1. Food crops have the highest output rate of 45.21 percent, followed by vegetable crops in second place, industrial crops in third place, and so on.

Investment Structure of Small Farmers

Small Farmer Development Program (SFDP) has partnered with 829 cooperatives, and the number of members getting services from these cooperatives has increased by 17.2

percent from the previous year, reaching 8 lakh 14 thousand 4 hundred and 71 in 2019/20. More than 4 million people were expected to profit from the initiative. Credit investment increased by 16 percent under the SFDP Program, reaching Rs.12.2446 billion. During the same period, loan collections climbed by 19 percent, while investment amounts climbed by 19 percent, reaching Rs. 21.9099 billion, compared to the previous year. Small farmers' shares, savings, and reserve funds have increased by 18 percent, totaling Rs. 37.404 billion. This program generated Rs. 45.9057 billion in the previous year's equivalent period, and increased by 21% to Rs. 55.7686 billion in the current year's corresponding time. A total of Rs. 15.8829 billion has been distributed to 137,970 small animal holder farmers in 59 districts through the Small Farmer Development Program. The farmers have reared 759,089 meat and dairy livestock from the loan disbursed in the same period (Table-2).

Table-2: *Status of Livestock Credit from 2014/15-2019/20.*

Details/Year	*2014/15*	*2015/16*	*2016/17*	*2017/18*	*2018/19*	*2019/20*
No. of credit transaction Institution	313	355	405	446	476	487
No. of Farmers taking credit	53680	68816	83242	102746	115983	137970
Loan approved (Rs. in ten million)	614.05	883.22	1223.29	1629.32	2060.12	2559.6
Loan investment (Rs. in ten million)	423.71	588.16	772.49	1035.05	1234.59	1588.3
Animal Number	295796	378098	449939	550833	677138	759089

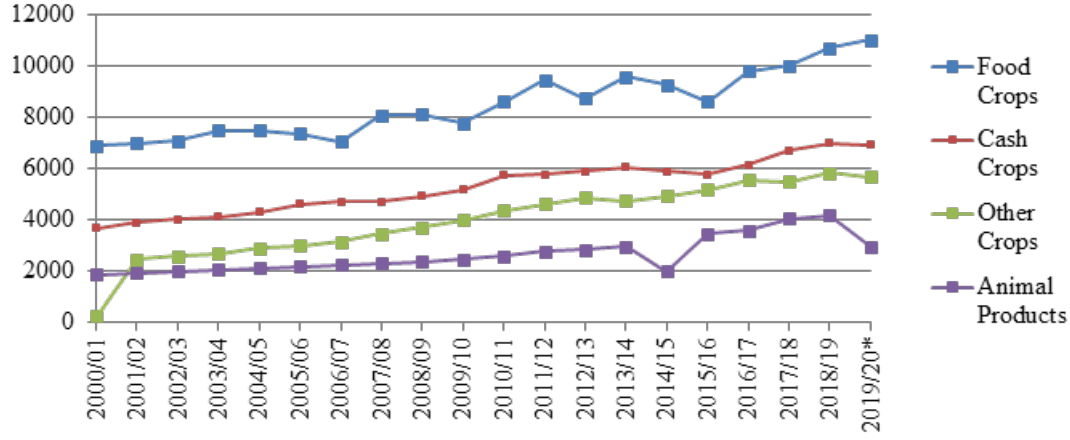
Source: MOF**,** Economic Survey 2019/20.

Trade Status of Agriculture Products

Agriculture items are among Nepal's most important exports. In the international market, Nepal exports vegetables, tea, spices, fats and oils, animal feed, and jute and other forest fibers. Nepal imports a variety of goods, including paddy, rice, maize, vegetables, fruits, animal feed, fat and oil, cotton, and other items. In 2018/19, Nepal imported Rs. 51.80 billion in food crops and Rs. 40.82 billion in 2019/20. Paddy and rice imports accounted for 60% of total imports of foodstuff. During that time, Nepal's exports were only Rs. 17 million. In 2019/20, Nepal imported Rs.1.78 billion worth of meat, fish, and cooked fish, as well as Rs.3.80 billion worth of cardamom, ginger, turmeric, chilli, and other spices. In 2019/20, Nepal exported agricultural items such as tea, coffee, ginger, pulses, and other crops. Agricultural items accounted for around 30% of Nepal's overall export trade and 15% of its total import commerce (MoF, 2019). From 2000/01 to 2019/20, Figure-2 displays the changes in food crops, cash crops, other crops, and animal goods. It also depicts the area of food and cash crops during that time. Food crops were 6889 metric tons in fiscal year 2000/01, cash crops 392.50 metric tons, other crops 238.55 metric tons, and animal product was 1858.98 metric

tons, whereas in fiscal year 2019/20, food crops were 10992.67 metric tons, cash crops 6918.30 metric tons, other crops 5679.68 metric tons, and animal product was 5679.68 metric tons. All crops have increased significantly during the research periods.

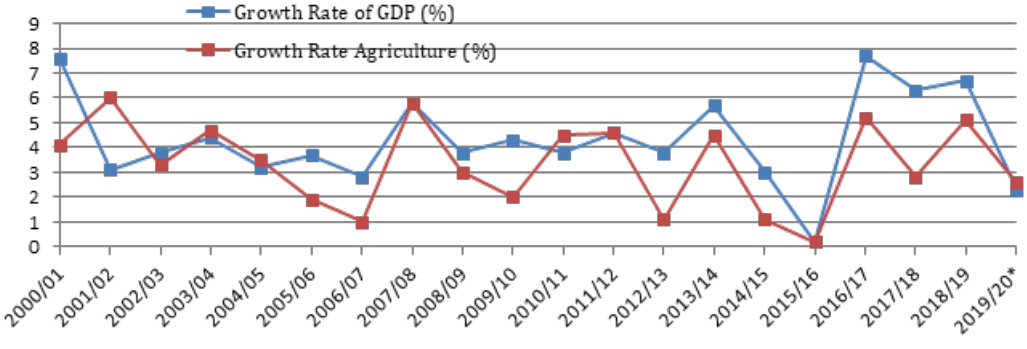
Figure-2 *Production Status of Major Crops of Nepal*



Source: Economic Survey 2019/20.

Figure-2 depicts the increasing trends of food crops, cash crops, other crops and animal products in the study periods. Figure 3 depicts the real GDP and agriculture sector trends and growth rates from 2000/01 to 2019/20. In 2000/01, the real GDP was Rs.394.05 billion, but by 2018/19, it had grown to Rs.850.93 billion. Similarly, in 2000/01, the agriculture sector contributed 38.33 percent (Rs.151.06 billion) to real GDP, whereas in 2019/20, the agriculture sector contributed 32.24 percent (Rs.280.59 billion). The growth rate of real GDP falls between 0.2 percent and 7.7 percent during the study period, whereas the growth rate of agriculture sectors remains between 1 percent and 6 percent.

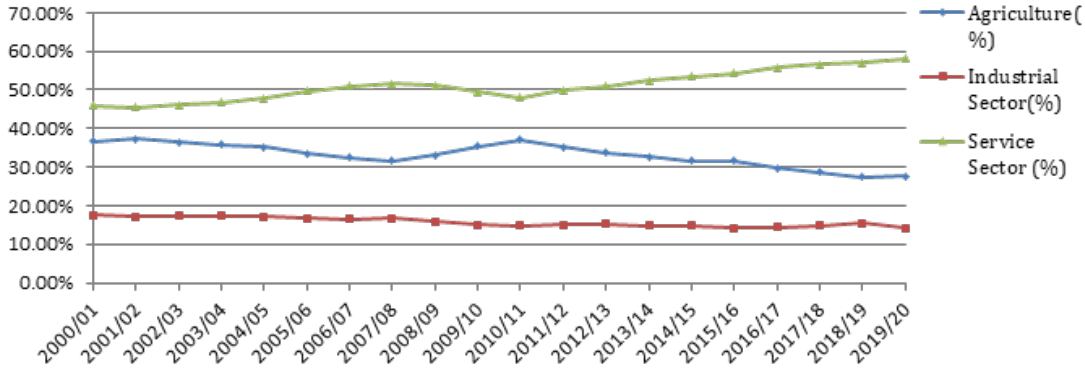
Figure-3 *Growth Trends of Agriculture Sector & Real GDP*



Source: Economic Survey 2019/20.

Figure-3 depicts the fluctuating trends of increasing rate of real GDP and agriculture sector in the study period.

Figure-4 *Sector-wise Share to real GDP of Nepal*



Source: Economic Survey 2019/20.

Figure-4 shows the contribution of each economic sector to real GDP. The service sector contributes the most to the national economy, while the industrial sector contributes the least. Agriculture makes a moderate contribution to the economy. The contribution of the service sector has been increasing, while that of the agriculture sector has been dropping. Throughout the research period, the contribution of the industrial sector has been consistent.

Impact of Agriculture Sector on Real GDP

The study discovered a positive association between Nepal's agriculture industry and its real GDP. Nepal can enhance its real GDP growth rate and the living level of Nepalese people by boosting agricultural productivity.

Table-3 *Regression between Agriculture Sector and GDP*

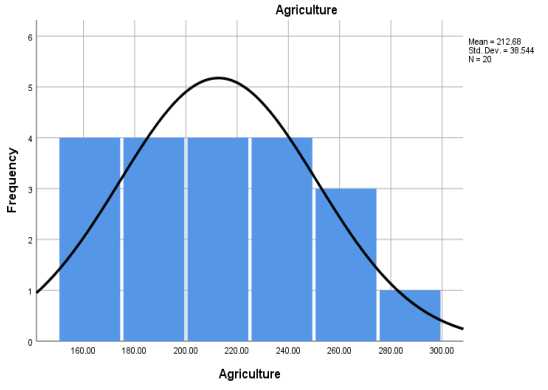
Multiple R		**R Square**	**Adjusted R Square**	**Standard Error**	**Observations**
0.994689729		0.989407658	0.988819194	15.5124155	20
	df	**SS**	**MS**	**F**	**Significance F**
Regression	1	404589.516	404589.516	1681.34086	3.12812E-19
Residual	18	4331.430621	240.6350345		
Total	19	408920.9466			
	Coefficients	**Standard Error**	**t Stat**	**P-value**	**Lower 95%**
Intercept	-209.3356764	19.9409062	-10.49780157	4.20713E-09	-251.2299657
Agriculture	3.785989004	0.092331835	41.00415662	3.12812E-19	3.592007018

Source : *Author's calculation based on Economic Survey,2010/11 & 2019/20.*

The study reveals a favorable association between farm sector production and Nepal's real GDP by analyzing data from 2000/01 to 2019/20. The findings appear to be true because all diagnostic metrics supported the link, such as the regression coefficient,

which is significant at a 5% p-value (R^2 = 98.9%). The findings indicate that the agriculture sector had a significantly impact on real GDP during the study period.

Figure-5: ***Histogram Agriculture Sector Contribution to GDP***

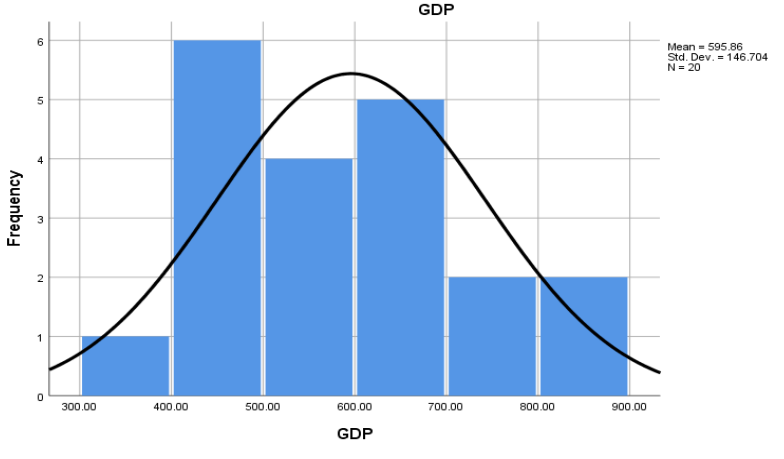


Source: *Table-3.*

The histogram of the agricultural sector's contribution to the economy is shown in Figure 6. During the study period, the average value of the agriculture sector was 212.68, with a standard deviation of 38.544. Agriculture has a high level of consistency with a standard deviation that is less than the mean value.

Figure-6

Histogram of Real GDP



Source: Table-3.

In the research period, the histogram of real GDP indicates that the mean value is 595.86 and the standard deviation is 146.704. Data consistency is also strong, with a coefficient variation (CV) of 24.62 percent. It denotes that the data is gradually dispersed over the course of the study.

Conclusions

The agricultural sector contributes significantly to the economy. More over 60% of economically active Nepalese residents are employed as a main source of income, contributing more than 27% of the country's GDP. With increased access to transportation services, agricultural financing, agricultural insurance, and the utilization of new technology and irrigation infrastructure, agriculture's importance continues to grow. The scope of demand for agricultural products has grown as people's spending power has expanded, as has demand for fruits and animal products, as well as improved awareness, behavioral changes, and increased production of organic foods in response to increased public interest in food cleanliness. The growing popularity of organic products among international tourists has created an opportunity to build a value chain in this industry.

Due to its location, Nepal is sandwiched between two large countries that are encouraging agriculture through the employment of innovative technologies and government subsidies. It is difficult to relate Nepal's subsistence farming to industrial growth by transforming it into a competitive and commercialized sector. It is critical to attract Nepalese younger workforce to farming by giving incentives and making them dignified through the availability of adequate labor, skills, and capital in order to improve the agriculture sector and increase its contribution to the economy. By enhancing regulatory requirements for quality and cleanliness, this industry becomes more profitable and competitive. Agricultural production should be expanded by inter-governmental coordination and collaboration, based on enhanced federal, provincial, and municipal investment and service efficacy, and directed toward self-sufficiency.

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