

Identifying the Role of Paddy in the Economic Development of Nepal

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Abstract

Nepal is an agricultural economy-based country where most of the population is dependent on Agriculture sector. The major components of agricultural sectors are food and cash crops, fisheries and livestock. Among the agricultural products, paddy is the highest consumed food in Nepal. Data show that the average cumulative paddy production has increased in the last few years. At the same time the import of paddy has gone up (TEPC, 2018). This paper discusses the significance of paddy production and its import on the economic development of Nepal.

The secondary data has been used for the study. A qualitative and quantitative data analysis method has been used for getting the results. Based on the analysis, production of paddy and Gross National Income (GNI) are highly correlated and has impact on the economic growth of Nepal. The analysis showed that production of paddy is significant with GNI ($\beta = 0.444$). The import of paddy has significant contribution in revenue collection. The new finding is that the production of paddy is significant for GNI, however it is not like imported paddy from outside the countries. It has been found that beta coefficients of paddy from outside the country are greater than that of the production within the country. It means that the imported paddy is more significant than paddy production for economic growth in Nepal. The main finding of this study is that import business of paddy and production of paddy are playing vital roles in economic growth of Nepal. So, government should provide incentives for production of paddy within the country which will reduce the cost of production of paddy.

Keywords: Paddy Production, Paddy Export & Import, Economic Growth, Nepal

1. Introduction

Nepal, the youngest federal democratic republic, has been passing through a protracted political transition since more than a decade. The country, as one of the 48 least developed countries of the world has per capita income of about US \$ 1004 in 2018 (MoF, 2018). Nepal has agro based economy. The Gross Domestic Production (GDP) at basic price of the Nepal was increased by 6.3 percent in the FY 2017/18, which is estimated to increase by 6.8 percent in FY 2018/19. Similarly, GDP at producer price is expected to be increased by 7.0 percent in the FY 2018/19, which was only 6.7 percent in the FY 2017/18. The volume of GDP in Nepal was worth Rs. 69.762 billion in 2001(MoF, 2010), whereas it has reached to Rs. 881.8 billion in 2017 (MoF, 2017/18).

Agriculture plays a crucial role in Nepalese economy. About 60.4% of population is engaged in agriculture for their livelihood (MoAD, 2015). The agricultural sector is considered as the largest pillar of the economy. The major components of agricultural sector are food and cash crops, fisheries and livestock. Contribution of the agricultural sector to GDP is in the declining trend, while that of non-agricultural sector is steadily growing. Contribution of the agricultural sector to real GDP, which stood at 36.6 percent in fiscal year 2001/02, has dropped to 28.8 percent in 2017/18 while that of the non-agriculture sector has gone up from 63.4 percent to 71.2 percent in the same period. Besides generating employment, agriculture supports national economy by contributing 33% in GDP. Nepalese agriculture, though diversified, is mostly dominated by three major cereal crops viz. rice, wheat and maize which jointly accounts for 30.92% of Agricultural GDP of the country (MoAD, 2015). These crops are vital for

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food security of the country. The country's self-sufficiency in food grain production has not been achieved as its growth could not keep the pace with increasing demand for food. Nepal ranks 72nd position in Global Hunger Index (GHI) of 22.0 among all the countries in the world (IFPRI, 2017).

Government of Nepal has introduced many policies and periodic plans to enhance productivity, profitability and commercialization of the agricultural sector during last few decades. Among them, Agricultural Perspective Plan (APP) from 1995 to 2014 was the important one, expected to enhance the livelihood of Nepalese farmers substantially. APP had aimed to accelerate the agriculture growth rate and commercialization through increased factor productivity (APP 1995). Many policies supportive to APP, like National Agricultural Policy (2004), Agribusiness Promotion Policy (2006), National Seed Policy (2000), National Fertilizer Policy (2002) and Irrigation Policy (2003) have been formulated after the APP was launched. Despite all these efforts, the extent of productivity growth and commercialization is low and hence 32 out of 75 districts are still food deficit in Nepal (MoAD/FAO/WFP 2015). The major challenges of Nepalese agriculture and food security at present are (1) Conversion of agriculture land for non-agricultural purposes (2) increasing-migration of economically active population (3) negative effect of climate change (4) inadequate use of fertilizer (5) limited use of improved technologies and (6) small and fragmented lands that hinder mechanization and commercialization (Shrestha, 2012). There is a large gap in the yield of cereal crops which is about 1 ton/ha between research station and farmers' field, however, minimization of the yield gaps by country's Research and Development sector might improve the food security in the country (Amagain and Timsina, 2005). After the APP (1995-2014), Government of Nepal has brought another plan known as Agriculture Development Strategy (ADS; 2015-2035) to address food and nutritional security through development of private and cooperative sector as one of the strategic components focusing on public private partnership (PPP) approach in several areas of agriculture (MOAD, 2014). Gairhe et al (2016) also highlighted the importance of PPP approach in the development of agriculture sector in Nepal.

Despite the positive aggregate national cereal balance in the recent years, domestic production has not been enough to meet the rice demand (MoAD/FAO/WFP, 2015). Food import is galloping in the country as import data shows that the import value has inclined from NRs. 44.43 billion in 2009-10 to NRs. 127.51 billion in 2013-14. The statistics showed that the import value of cereals from India was NRs. 35.12 billion. Of which, rice's share was NRs. 23.79 billion and the maize's share was 7.43 billion in 2013-14 (Kathmandu Post 2015). On the contrary, Timsina et al (2012) reported that Nepal has sufficient food to meet the national demand and Tarai of Nepal had about 506247 ton of food surplus in 2011, however at the same time, the remaining two agro-ecological regions (Hill and Mountain) were in the food deficit condition. Similarly, as compared to the previous decade, the growth rates in the production of both rice and wheat declined in the period 2001–2009 (IFPRI 2011). Such analysis on the cereal production trends and dynamics in terms of area, production and productivity might be useful to understand the cause and effects in decrease in production of cereals. Therefore, the present work focuses on dynamics of major cereal crops over two decades and such knowledge might be useful in the implementation of Agriculture Development Strategy and formulating policies for enhancing food security situation.

In FY 2018/19, the production and productivity of agriculture sector has increased due to favorable weather condition, increased access to irrigation facilities and easy availability of seeds and chemical fertilizer. These are the major accelerating forces that estimated economic growth to be higher in FY 2018/19. The agriculture sector is estimated to grow by 7.5 percent. Contribution of agriculture sector to

GDP is gradually decreasing every year, while that of non-agricultural sector is increasing. Consequently, the contribution of agriculture sector is estimated to stand at 27.0 percent in the current FY 2018/19 while their contribution during FY 2017/18 was 28.1 percent (Economic Survey 2018/19)

Cereal crops especially paddy, maize and wheat are the mainstay of Nepal's agriculture production. These three cereals occupy more than 75 percent of cultivated area in Nepal. Rice, the most common crop, accounted for 35 percent of total cultivated area and 46 percent of cereal area in 2008/09 (Nepal, MoAC 2009). Cereals in Nepal are also crucial from the food security point of view because they form the staple diet of the Nepalese population, providing nearly 69 percent of total dietary energy and 63 percent of total dietary protein during the period from 2005 to 2007 (FAO, 2010).

The Ministry of Agriculture and Livestock Development (MoALD) estimated that the total production of paddy in the first year of study period (1998/1999) was 3709770Mt and that of the last year (2017/18) was 5151925 Mt. Paddy production ranges from Morang in Terai to the hilly region in Jumla. The paddy is major agricultural commodity and it is playing the vital role in food supply and economic growth in Nepal (Nepal, MoAC 2009).

2. Statement of the Problems

The imports of agricultural commodities are in increasing trend, at the same time the agricultural production is also in increasing trend (MoALD). This is due to favorable weather, easy availability of fertilizers and increase in the production of food grains, vegetables and sugarcane has increased by 13.8 million quintals (12 Lakh 44 thousand 8 hundred metric tons) in the year 2017/18 (MOALD, 2018)

According to the Ministry, the availability of agricultural inputs like fertilizers, seeds, extension of irrigation facilities and favorable weather favored the increase in the production and productivity of the agriculture sector. Though, production of major food crops and vegetable crops has increased, at the same time 5.7 billion rupees of rice was imported in the 2017/18, (Customs Department, 2017/18). The import of rice worth 9.6 billion in the last fiscal year has increased by three billion rupees. The Ministry of Agriculture has said that only sweet, fine rice has been imported from abroad. According to the ministry, five Lakh tons of rice are inadequate on demand. About two trillion rupees of agricultural and livestock products are imported annually.

The agricultural sector plays vital role in livelihoods and economy. However, Nepal's agricultural trade is in deficit. The imports of food and live animals were worth of NRS 1.8 billion in 1990, which increased to NRS 130.6 billion in 2016. Likewise, value of the exports of food and live animals were nearly NRS 1 billion in 1990 which climbed to NRS 18.3 billion in 2016. The import of agricultural products has increased by more than 72 times but the growth of export since 1990 to 2016 is only 20 times. The data show the trade deficit on agriculture product is NRS 112.3 billion. Nepal is still the net importer of agricultural products, despite being an agricultural economy. The above-mentioned volume of agriculture products import has been increasing every year. Along with the increasing volume of agriculture products import, the trade deficit of Nepal has also increased. In this context, this study focuses on:

- To identify the trend of paddy production of Nepal.
- Whether paddy productions plays significant role in the course of economic Growth or not?

3. Data and Methodology

The secondary data published by the Trade and export promotion center (TEPC) and Ministry of Agricultural and Livestock Development is the major sources for the study. Cross sectional descriptive study was conducted among the paddy commodity to prepare this report. Data since 1999 to 2018 has been used. All data were analyzed using statistical package SPSS (version 16.0; SPSS Inc., Chicago, IL, USA).

Pearson Correlation and Multiple Regression Analysis (MRA) methods were used to analyze the infrastructures that were used as the explanatory variable. The MRA was used to identify the impact study of paddy on GNI by using the equation below:

$$Y = \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \mu$$

Where:

Y = Predictor variables Gross National Income (GNI). It is used for measuring the Economic Development

X_1 = Paddy production, X_2 = Paddy export, X_3 = Paddy import, β =Coefficients, μ = Error terms

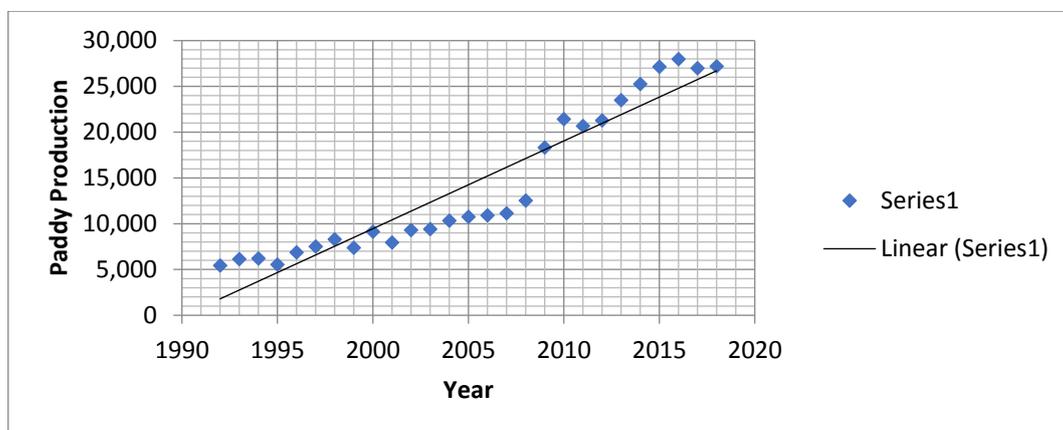
4. Data Analysis and Empirical Results

The trend of paddy production in Nepal

The trend of paddy, maize and wheat production in Nepal from 1990 to 2018 is shown in the figure 1. It depicts that the production of paddy has been increased during the study periods. The production of paddy was 35, 02160 Mt in 1990 and reached to 51, 51925 Mt in 2018. The graph presented below shows that the trend of paddy production is growing. Similarly, the following graph shows an increase in agricultural products since 1990 to 2018. The graph also shows an increase in the paddy since 2001 to 2008 and a gradual growth until 2009. The growth rate was increased highly due to enough rainfall and good environment for cultivation of crop. During 2009– 2010AD, production rate increased further higher but stalled in 2009. Between the period 2009-2010 AD, Paddy production increased drastically due to factors such as Government's subsidy on seed and fertilizer to the farmers, adoption of new technology, scientific cultivation practices, increased irrigation facilities and favorable environmental condition.

In fact, due to open boarder especially in Terai region farmers brought some high yielding varieties (viz Ranjit, swarna etc.) from India for their cultivation. In 2011-2012AD, Paddy production was decreased as compared to 2010 AD; the major reasons were drought, so called kala diwas (black day) for rice production and insect pest disease outbreak (viz. Plant hopper, milly bug, blast, bacterial leaf blight). The paddy production rate slowed down slightly. However, since 2012, there was an increase in the rate stretching up to 2018.

Figure 1. Paddy production in Nepal from 1990 to 2018



The average annual production and average annual growth of the paddy in Nepal from 1999 to 2018 has been shown in Table 1. The data is segregated into two different periods with ten year interval, from 1999-2008 (first), 2009-2018 (second) and total period of 1999-2018 (overall). The average production of paddy was higher in second term, and overall period as compared to first period. Similarly, average growth rate of the paddy is higher in first ten year. The production of paddy crops had shown increasing trend. The average annual growth rate of the paddy, in overall study period (1999 to 2018) is about 0.95 percent respectively. In the fiscal year 2019/20, the area of paddy production has reduced by 2.2 percent and paddy production has decreased by 1.05 percent compared to that of the fiscal year 2018/19. The productivity of paddy has increased in current fiscal year.

Table 1: Average Production, compound growth and average growth rate of Paddy

Production-Mt, growth-%

Crop	1999-2008		2009-2018		1999-2018	
Paddy	Average production	Compounded annual growth rate	Average production	Compounded Annual growth rate	Average production	Compounded annual growth rate
	4118843.40	1.10	4710153.5	0.41	4414498.45	0.95

Identifying the relationship of paddy in economic Growth

The Correlation between the dependent and independent variables is presented in Table 2. The correlation coefficient of all variables suggests that there is a positive correlation between the dependent variable and the independent variables. Hence, four total different variables have been used to identify the significant variables on Nominal GNI. Only two variables are found significant with the GNI at the 1% significant level. The Import of agricultural commodity as paddy is one of the important findings of this study. It is positively correlated with the GNI ($r= 0.976^{**}$, $p\leq 0.01$) which implies that the revenue from imported paddy highly contributed in real Gross national income than export of paddy. It means that the amount of paddy export is not significant for GNI.

Table: 2. Correlations with Nominal Gross National Income

		Paddy production	GNI	Exports	Imports
Paddy production	Pearson Correlation	1			
	Sig. (2-tailed)				
Gross National income	Pearson Correlation	.767**	1		
	Sig. (2-tailed)	0			
Exports	Pearson Correlation	0.092	0.11	1	
	Sig. (2-tailed)	0.716	0.665		
Imports	Pearson Correlation	.755**	.976**	0.106	1
	Sig. (2-tailed)	0	0	0.676	

** . Correlation is significant at the 0.01 level (2-tailed).

Paddy production and GNI is positively correlated ($r = 0.767^{**}$, $p \leq 0.01$). This means that paddy production contributes the household's income as well as GNI. The production of paddy and import of paddy are also positive correlated ($r = 0.755^{**}$, $p \leq 0.01$) to each other. It means that the import of rice helps to generate revenue and which ultimately goes to agriculture subsidies. it might be positive correlated to each other.

Analysis of Role of Paddy in Economic Development:

Using the earlier model stated in this paper, a total of three independent and one dependent variable were used to identify the impact on GNI. It is significant with GNI (Table-3). Results indicate that only two variables are significant, namely Paddy production, Import of Paddy. It means that this model of null hypothesis (H_0) is rejected at the significance level of $p \leq 0.01$ whereas, $R^2=0.930$ respectively.

Table: 3: Regression Analysis and its Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-40259.35	983854.16		-0.041	0.969
	Production	13.426	11.078	0.444	1.212	0.271
	Export	-5824.466	8314.662	-0.081	-0.701	0.51
	Import	308.18	215.104	0.516	1.433	0.202

Note:- Dependent Variable: GNI

Table 3 shows that production of paddy is significant with GNI ($\beta = 0.444$). The finding is a normal one as an increase in paddy production is generally correlated to the economic growth. The production of paddy is increasing however, it is not at satisfactory level but it is significant for GNI of Nepal. The paddy field is in decreasing trend since few decades. The paddy field in 2000 AD was 15,50,990-hectares which was reduced in 2015 to only 14,25,346, hectares. It shows that the decrease in the cultivation land of paddy

resulted in the low production of the paddy making insignificant contribution to the economic growth of Nepal.

Based on the regression analysis, we found that the import of paddy has the significant and direct positive impacts on Nominal GNI ($\beta = 0.516$). It shows that large amount of paddy import from outside the country—occurred owing to differences in the cost between that of Nepal and exporting countries. The import also helps to collect revenue. The collected revenue finally contributes the economic growth of Nepal.

The new finding is that the production of paddy is significant for GNI; however it is not as like imported paddy from outside the countries. We have found the coefficients of production of paddy ($\beta = 0.444$) and import of paddy ($\beta = 0.516$). It seems that beta coefficients of paddy from outside the country are greater than the paddy produced within the country. Mainly, fine or aromatic rice (high value rice) and to some extent coarse rice is also imported from outside. The reason is that about 32 hilly districts are having food deficit. So trend of import of paddy is increasing and its impact on GNI has stronger than paddy produced within the country. It means that the imported paddy is more significant in economic growth of Nepal than paddy produced within the country. Paddy imported from outside plays vital role in economic growth of Nepal.

5. Conclusion

In this study, we inspected the influence of agricultural products, agriculture exports and imports on economic growth during the 2007 to 2018 A.D. To this end, we used correlation analysis and Regression analysis based on Pearson Correlation and Multiple Regression Analysis (MRA) methods. The analysis showed that the trend of paddy production is increasing however the cultivation land of paddy is decreasing over the study periods. The production of paddy was 35, 02160, in 1990 and 51, 51925 Mt in 2018. Only 35% agriculture land has been used for cultivating paddy and productivity of paddy also increased in 2018 (Stat, MoALD). Even though, the import of paddy has registered increasing trends since few decades.

The relation between GNI and Agriculture production are strongly correlated, it means that production of paddy is playing vital role in the economic growth of Nepal. Similarly, the import trade of paddy is playing vital role for GNI as well. The analysis showed that import of paddy is the most significant for Nominal GNI of Nepal. The import of paddy is providing the revenue essential for the increase of GNI of Nepal.

The main findings of this study are that imported paddy and production of paddy are also playing vital role for economic development of Nepal. However, the policy-makers should have considered the production of paddy for replacing the imported paddy from outside the country.

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