Agricultural Credit flow of Commercial Banks and Impact on Agricultural Production in Nepal

Narayan Sharma Rimal[*]

M.Sc. Scholar, Division of Agricultural Economics, Indian Agricultural Research Institute, New Delhi-110012, India

*Corresponding Author:
Narayan Sharma Rima
Email: asimsarma48@email.com

Abstract: The agricultural performance engrosses many production factors and agricultural credit is one of them. It needs of time that credit agencies come up to help farmers in applying and undertaking the improved farm practices. Thus, the present study attempts to determine the impact of agricultural credit of commercial banks on agriculture production in Nepal by estimating Cobb Douglas Production Function for the period of 2002-2012 using time series data obtained from various issues of Economic Survey, Banking and Financial Statistics, Ministry of Finance and Statistical Information on Nepalese Agriculture, Ministry of Agricultural Development, Government of Nepal. As per the model estimated during the period, the coefficient of natural logarithm of agricultural credit per cultivated area which is the major explanatory variable is positive and significantly impacts the agricultural production of the country i.e. a percentage change in agricultural credit flow of commercial banks will on an average brings 0.183 percent change in agricultural gross domestic product (AGDP). Although, the consumption of fertilizer and improved seeds showed positive relation with AGDP do not significantly bring changes in agricultural production in the country during the period. Thus, the study bring to a close estimation that agricultural credit flow of commercial banks have positive impact on agricultural production and is significant determinant of improving Agricultural Gross Domestic Product of the agrarian country like Nepal.

Keywords: Agricultural Credit, Cobb-Douglas Production Function, Agricultural Gross Domestic Product.

INTRODUCTION

The entire agriculture sector has been playing crucial role in the Nepalese economy. The role of agriculture is important mainly because it has been creating employment opportunities to the entire agricultural rural communities and providing food security to the country. It is imperative to make the agriculture sector efficient through the means of comparative and competitive advantages by commercializing and diversifying this sector in today's open market of international context. On the basis of available means and resources, the agriculture sector has been accorded top priority since the Fifth Five-Year Plan among the periodic plans. Special emphasis is given to the formulation of time-conducive agricultural policies and their effective implementation together with their monitoring and evaluations for development of this sector. The entire programs of agriculture developments are directed towards bringing positive changes in the lifestyles of majority of agricultural communities by enhancing overall agricultural production and productivity. Contribution of the agriculture sector has remained close to one third of Gross Domestic Product (GDP) while about two third of country's population is active in this sector alone for income. Contribution of this sector that was 35.36 percent in 2011/12 remained at 34.33 percent in 2012/13 [1].

Agricultural output is low in Nepal and main reason behind the fluctuation of agricultural production is due to small holdings, traditional methods of farming, poor irrigation facilities, low or misuse of modern farm technology, credit availability etc. This results in small income and no saving or small saving by the large population dependent in agriculture. Therefore, it needs of time that credit agencies come up to help them in applying and undertaking the improved farm practices. Access to agricultural credit is vital to uplift the living standard of the agro-based rural people. Credit is an important instrument that enables farmers to acquire commands over the use of working capital, fixed capital and consumption goods [2]. Credit plays an important role in increasing agricultural productivity. Timely availability of credit enables farmers to purchase the required inputs and machinery for carrying out farm operations [3]. Credit is provided for relief of distress and for purchasing seed, fertilizer, cattle and implements. Use of modern technology increased demand for credit and resulted in increase in

agricultural productivity of small farmers. Access to credit promoted the adoption of yield-enhancing technologies. Study estimating demand and supply of credit and its role in poverty alleviation in India emphasized on supply of credit to increase technical assistance to the farmers which leads to increase in agricultural productivity [4]. Developing countries improved their agricultural output by introducing modern agricultural technology such as chemical fertilizers, recommended seeds, tractors and modern irrigation facilities etc. But modern agricultural technology was capital intensive and hence increased demand for credit [5]. Credit had been only a meek cause of agriculture growth in Nepal, however the combined effect of irrigation, fertilizers, seeds and pesticides are positively and strongly correlated with the amounts of institutional credit and the real gross domestic product of agriculture sector in a given time period [6].

In the country like Nepal, modern agriculture is essential for economic growth which is possible only meeting the financing needs of the farmers. In these circumstances the flow of credit from financial services system is inevitable in order to achieve the goal of agricultural growth which is directly associated with the economic growth of the country. As no more literature are available regarding the impact of agricultural credit flow on aggregate agricultural production in Nepal, the current study attempts to analyze the impact of agricultural credit flow of commercial banks on agricultural production in Nepal. The study limits only to the commercial banks, the prominent and deeply rooted financial system of Nepal regarding the agricultural credit flow because of the dominant share of commercial banks in domestic financial services system and data availability for the study period.

MATERIAL AND METHODS

The study attempts to determine the impact of agricultural credit of commercial banks on agricultural production in Nepal using time series data during 2002-2012 in estimating Cobb-Douglas Production Function with agricultural gross domestic product (AGDP) as dependent variable and agricultural credit of commercial banks as independent variable. The other explanatory variables included in the model are consumption of fertilizers and improved seeds. Such

selection of variables has been made on the basis of literature surveyed and previous studies. The data regarding agricultural GDP, consumption of fertilizer and improved seeds were obtained from various issues of Economic Survey while the agricultural credit of commercial banks were obtained from Banking and Financial Statistics, Ministry of Finance, Government of Nepal [7-8]. To avoid the problem of Multicollinearity and to overcome the problem of degree of freedom all the variables are transformed to per cultivated million hectares area. To estimate the Cobb Douglas production function all the variables are transformed to logarithmic form. The model used in the study is:

$LnAGDP/CulArea = b_0 + b_1 LnAgCre/CulArea + b_2 LnConFer/CulArea + b_3 LnConImSe/CulArea + Error Term$

Where,
LnAGDP/CulArea = Natural Logarithm of Agricultural Gross Domestic Product per Cultivated Area.
LnAgCre/CulArea = Natural Logarithm of Agricultural Credit per Cultivated Area.
LnConFer/CulArea = Natural Logarithm of Consumption of Fertilizer per Cultivated Area.
LnConImSe/CulArea = Natural Logarithm of Consumption of Improved Seeds per Cultivated Area

RESULTS AND DISCUSSION
Trends and Patterns of Agricultural Credit of Commercial Banks

Figure 1 shows the agricultural credit flow of commercial banks during 2002-2012 in Nepal. Although the credit flow declined in 2009 due to political instability and failure in the implementation of program from state level, it showed increasing trend in whole period. It increased from 10,120 Million Rupees in 2002 to 37,685 Million Rupees (here onward Rs. Indicates Nepalese Rupees) in 2012. However, the figure shows that the annul percentage change in agricultural credit flow of commercial banks during 2012 declined to 23.6 percent which was otherwise 36.5 percent in 2011. The positive change in agricultural credit flow was rapid after 2009 in the country.
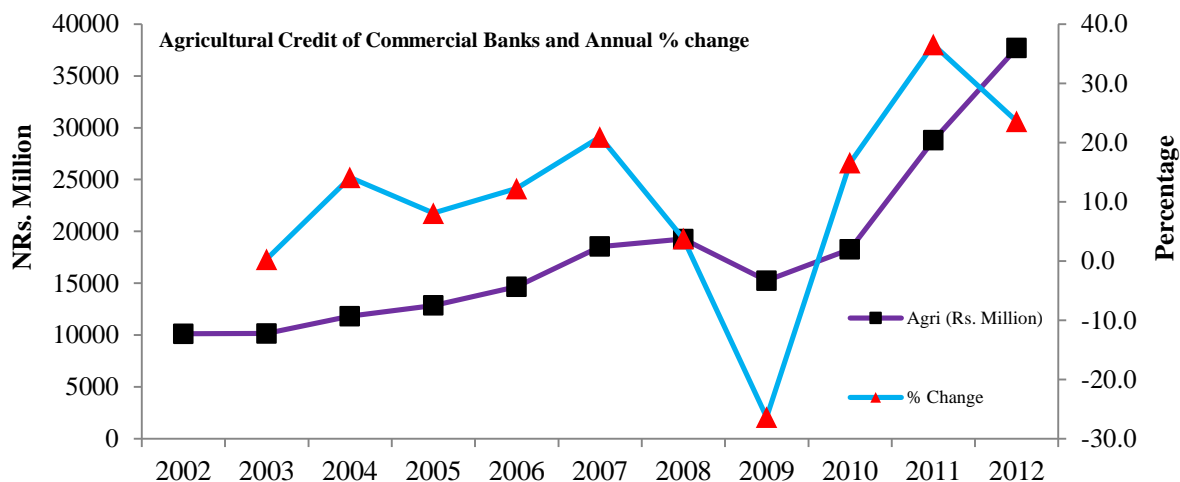
Figure 1: Agricultural Credit of Commercial Banks and Annual Percentage Change
Source: Based on the data from Banking and Financial Statistics, NRB, 2012

Figure 2 depicts the behavior of agricultural credit flow of commercial banks as percentage of agricultural gross domestic Product (AGDP) over the period 2002-2012. Agricultural credit flow was having 6 percent share of total AGDP in 2002 which increases to 10 percent in 2008. It decreases to 7 percent during 2009 but afterward showed rapid increase and reached 17 in 2012. Thus, the share of agricultural credit flow of commercial banks in total AGDP is showing increasing trend during the study period which is consistent with the increased amount of agricultural credit of commercial banks in the same periods.
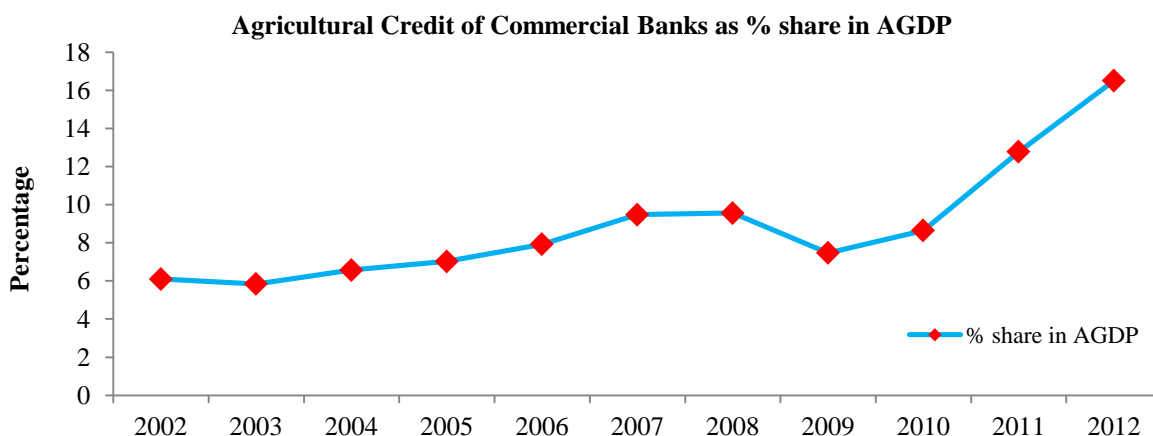

Figure 2: Agricultural Credit of Commercial Banks as percentage Share in AGDP
Source: Based on the data from Economic Survey and Banking and Financial Statistics, 2012

The agricultural credit was 3,274 Rs/Ha in 2002 which increased to 6,231 Rs/Ha during 2008 but decline to 4,390 Rs/Ha in 2009 (Figure 3). The figure showed rapid increase of agricultural credit per cultivated area after 2009 and accounted to 12,192 Rs/Ha in 2012. Thus, agricultural credit per cultivated area showed increase during the study period because of the increased amount of agricultural credit and almost constant level of total cultivated area of Nepal.
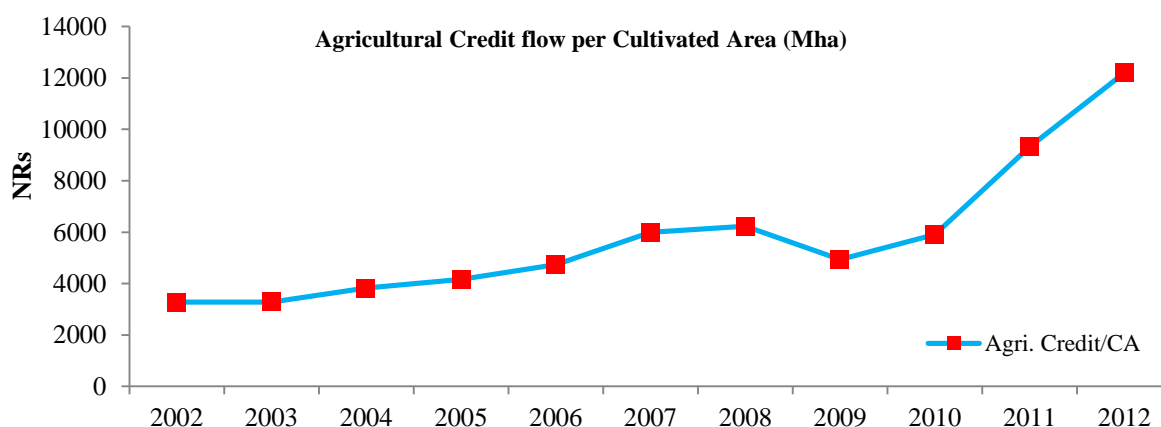
Figure 3: Agricultural Credit flow per Cultivated Area (Million Hectare)
Source: Based on the data from Banking and Financial Statistics and Statistical Information on Nepalese Agriculture, 2012

Impact of Agricultural Credit on Agricultural Production

To overcome the problem of Multicollinearity all the variables in the study are transformed to per cultivated million hectares area and model was fitted by taking natural logarithm of all the variables. The test of Multicollinearity in table 2 showed no sign of Multicollinearity with the value of variance inflation factor (VIF) being less than 10 and also the tolerance value not being near to zero.

Table 1: Test of Multicollinearity

Variables	Variance Influence Factor (VIF)	Tolerance
LnAgCre/CulArea	2.38	0.4209
LnFerCon/CuArea	2.13	0.4684
LnConImSe/CuArea	1.5	0.6645

Thus, the Cobb-Douglas Production Function was estimated with the ordinary least square method and result is obtained as in the table 3. The result shows probably no problem of autocorrelation which is severe in estimating Cobb-Douglas Production Function with least square method. The significant F-statistics indicates the estimating variables best fit the model and adjusted R^2 (0.8912) indicates that natural log of the variables included in the model are able to explain 89 percent variation of the natural log of the agricultural production over the period of 2002-2012. The coefficient of natural logarithm of agricultural credit per cultivated area (LnAgCre/CulArea) which is the major explanatory variable is positive and significantly impacts the agricultural production of the country during the study period. The table shows that a percentage change in agricultural credit flow of commercial banks will on an average brings 0.183 percent change in agricultural gross domestic product (AGDP). The other variables are positive but non-significant i.e. the consumption of fertilizer and improved seeds do not have impact on agricultural production of Nepal during the study period. The non-significant result may be due to the shortage of fertilizer and seeds during peak cultivation period and consumption of such inputs mainly in the plain region of Nepal which are easily accessible and traded from the free border between India and Nepal. The availability of factual official records also might be the cause of such kind of non-significant result of major inputs in agricultural production.

Table 2: Result of the Estimated Model

F-statistics	28.31	Prob > F	0.0003	
Adj R^2	0.8912	D-W statistics	1.499	
	Coefficient	Std. Err.	t	P-Value
LnAgCre/CulArea	**0.1829***	**0.0403**	**4.53**	**0.003**
LnFerCon/CuArea	0.0101	0.0121	0.83	0.434
LnConImSe/CuArea	0.0936	0.0500	1.87	0.104
Constant	10.173	0.6754	15.06	0.000
* Indicates coefficient is significant at 1% level of Significance.				

CONCLUSION

The agricultural performance engrosses many production factors and agricultural credit is one of them. Agricultural Credit of Commercial Banks in Nepal showed increasing trend during the period. It showed decline during 2009 but spurting up in the recent periods. The pattern of share of agricultural credit of commercial banks to agricultural gross domestic product (AGDP) is increasing throughout the study period with slight decline during 2009.The share was 6.11percent during 2002 which has increased to 16.50 percent in 2012. Agricultural Credit per Cultivated Area increases significantly during the period which may be due to increasing credit and almost constant level of total cultivated area of the country.

The estimated Cobb-Douglas Production Function showed that agricultural credit flow of commercial banks during the study period was positively and significantly impacting the agricultural gross domestic production of Nepal. However, the amount consumption of fertilizer and improved seeds being positive are not having significant impact on agricultural production. Thus, the study concludes that increasing availability of agricultural credit of commercial banks has positive impact on improving agricultural production in the agrarian country like Nepal and raises the concern regarding the consumption of fertilizers and seeds, records of which are mostly beyond the official controls. The study also recommends that the financial services system focused on urban-area most extend and deepen their services in providing agricultural credit in time and facilitate the agricultural production system of the rural areas of the country.

REFERENCES

1. Economic Survey; Ministry of Finance, Government of Nepal, Kathmandu, Nepal, 2012.
2. Siddiqi M, Wasif Mazhar-ul-Haq, Kishwar NB; Institutional Credit: A Policy Tool for Enhancement of Agricultural Income of Pakistan. International Research Journal of Arts and Humanities, 2004; 37.
3. Abdul S, Hussain M, Munir M; Impact of Micro Credit in Alleviating Poverty: An Insight from Rural Rawalpindi, Pakistan. Pakistan Journal of Social Sciences, 2009; **7**(1): 90-97.
4. Dantwala ML; Estimates of Demand for Credit and Its Role in Poverty Alleviation. Indian Journal of Agricultural Economics, 1989; 44: 416-422.
5. Jonson, Bruce F, John Cownie; The seed-Fertilizer Revolution and Labor Force Absorption. American Economic Review, 1969; LIX 4: 569-582.
6. Shrestha CM; Institutional Credit as a Catalyst for Agricultural Sector Growth: Evidence from Nepal. Journal of Economic Development, 1992; 17 (2).
7. Banking and Financial Statistics; Nepal Rastra Bank, Bank and Financial Institution Regulation Department, Statistics Division, Kathmandu, Nepal, 2012.
8. Statistical Information on Nepalese Agriculture; Ministry of Agricultural Development, Agri-Business Promotion and Statistics Division, Statistics Section, Government of Nepal, Kathmandu Nepal, 2012.