

economic growth and contributes to improved livelihoods and food and nutrition security leading to food sovereignty”. This plan envisages an agricultural transformation that changes traditional type of agriculture to the modern one, which interlinks agriculture with industry and services to generate income.

However, the ADS still lack to provide a clear idea to transform agriculture into industry. As a result, agricultural trade deficit in the first five year is still high and has no indication of improvement. The first five years plan to reduce agricultural trade deficit to zero or to maintain food self-reliance condition fails to meet the target. The elasticity of agricultural share in GDP with respect to GDP per capita is also lowest in Asia (Briones and Felipe, 2013). Nepal holds top rank in the world on occupying high employment share in gross domestic product (GDP). Having examined the structure of the economy, it is observed that the share of agriculture in GDP accounted for highest proportion followed by service sector before 2001, while the scenario is opposite after 2001.

The recent growth in Southeast Asian countries supports the fact that agriculture sector and industry sectors should move together to achieve sustainable growth (Moon and Lee, 2013). However, the prominent issue of great importance for the poor countries is how to transform agricultural sector to secure sustainable and greater source of income. Despite the global uncertainty of food security to feed the growing population across the world, low income countries have to challenge to overcome the low income per capita and low productivity in agriculture, balancing and transforming agriculture and manufacturing sectors. In this context, this paper analyzes the recent development of agriculture and its role on economic transformation to explore the future of economic growth.

2. Agricultural Transformation: Meaning and Practice

As of the classical theory (traditional - Lewis theory) agrarian revolution and industrial revolution goes together (Timmer, 1988). When manufacturing sector does not produce food, there is scarcity of food and that increases the demand for food as well as manufacturer’s cost of input. This reduces the profit of the manufacturers and cannot produce in volume unless agricultural productions grow well at the same time. It means stagnation in agriculture leads to stagnation in industrial development (Lewis, 1954). The expansion of agricultural sector creates a demand for consumer goods such as fertilizer, transport, machineries, textiles, and clothing. Hence, the manufacturing sector also grows at the time of agricultural development. However, in practice, imports of

goods may rise if there is no favorable industrial policy in the country. For Nepal, Indian manufacturing industries produce the goods with more advanced technologies which is more cost effective than the one produced by the local industries. Unless the government adopts suitable policy to protect local industries, the expansion of agriculture would not cause industrial development in Nepal.

According to (FAO, 2006), the first step of agricultural transformation involves shift from staple crops to high value crops. It may be either diversification or specification of agriculture. Then Second step is to move supplying high-value added products which may be in the form of timely, quality products. Then interlinking it processing industry and to market. Lastly, during these processes, government should provide friendly industry policy, price policy and technology policies. While developing agriculture and industry, the inequality between rural and urban people may raise sharply. Most of the successful economies of Asia followed the development pathway of industrialization based on agricultural transformation (Briones and Felipe, 2013).

The development experience of industrialized countries shows that agriculture sector and industry sectors should move together interlinking to each other (Moon and Lee, 2013). Over the last 50 years, the productivity growth in non-agricultural sector were found to be faster than the agricultural sector in Asia, although there is huge importance of agriculture sector for the promotion of labor productivity in non-agricultural sector (Imai, Gaiha and Brescaini, 2017). Anik, Rahman and Sarkar (2017) assessed sustainability among the south Asian countries and argued that improvement in technology capital, research and development in agriculture and human capital is key to enhance agricultural productivity. There is a literature gap regarding the empirical study on agricultural transformation and economic growth in Nepal.

3. Agricultural Performance in Nepal

As shown in Fig. 1 (a), the contribution in agriculture in GDP was higher than industry and service sector before 2001, but after then service sector led the overall economy. This indicates the structural transformation in the economy. The contribution of agriculture and service sector in the economy is in opposite trend. While agriculture sector is continuously declining, service sector is inclining rapidly. In 2016, the shares of agriculture, industry and service are 32.9, 14.5 and 52.2 percent, respectively. The share of industry in GDP is significantly low in comparison to other countries in the world.

During the course of development, productivity between agricultural sector and industry sector or service sector narrows down. As Fig. 1(b) shows, this does not seem to be true for Nepal. The gap between agricultural productivity and industrial productivity was highest in the 1990s but gradually declined while coming to 2001. This decline was not due to rise in agricultural productivity; rather it was due to fall in industrial productivity. After 2001, the productivity growth in industrial sector started to increase for some years. But after 2008, both agricultural and industrial sectors remained stagnant. The agricultural transformation process has been very slow.

Figure 1 (a): Value Added in Different Sectors

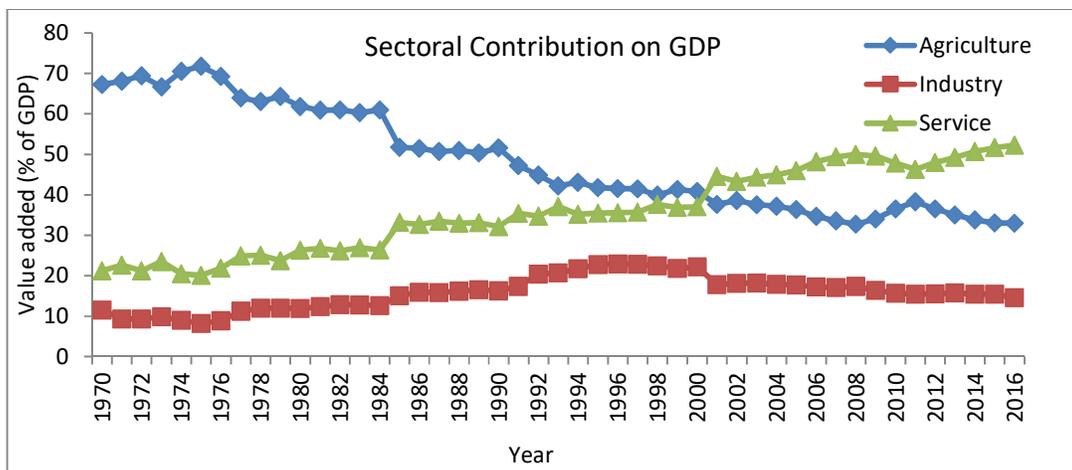
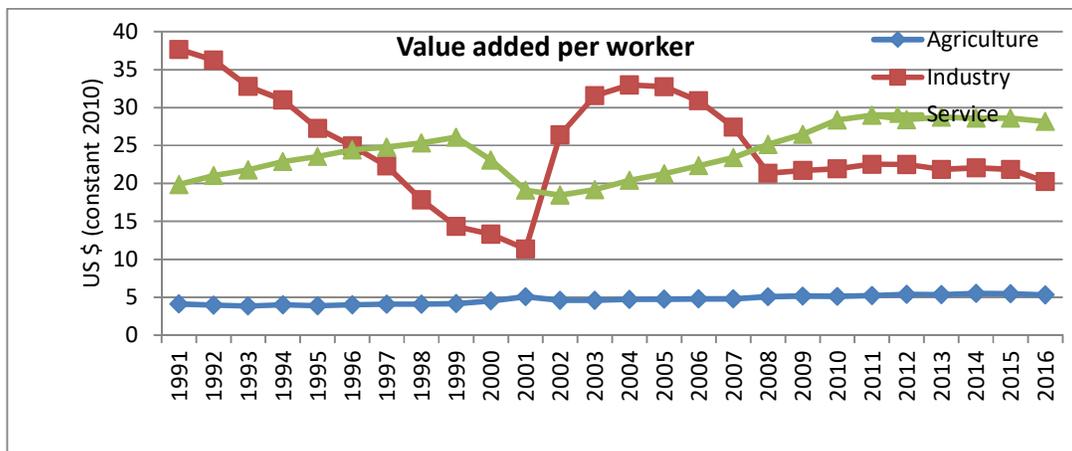


Figure 1 (b): Value Added Per Worker



Source: WDI, World Bank

i. Productivity Analysis

Table 1: Output Productivity of the Worker

Output-Employment ratio in 2008			
Country	Agriculture	Industry	Service
Nepal	0.442947477	1.600514314	3.272414191

Source: Author's calculation based on the data of WDI, World Bank

Note: Sector-wise Value Addition in 2008 is almost same as that of 2015.

Output-Employment ratio shows that output efficiency of the worker in agriculture is very low in comparison to other sectors. As Table 1 shows, one percent employed worker generates only 0.44 percent of value value addition in GDP in agricultural sector, while they contribute 1.6 percent in industrial sector and 3.27 percent in service sector. It means output efficiency per unit worker in industrial sector is 3.6 times and in service sector is 7.43 times higher than the agricultural sector. When we observe the scenario of Asian countries, it shows that the ratio of output and employment is found to be lowest in agriculture sector among all three sectors. It indicates that the productivity in agricultural sector is lower than the other sectors of the economy.

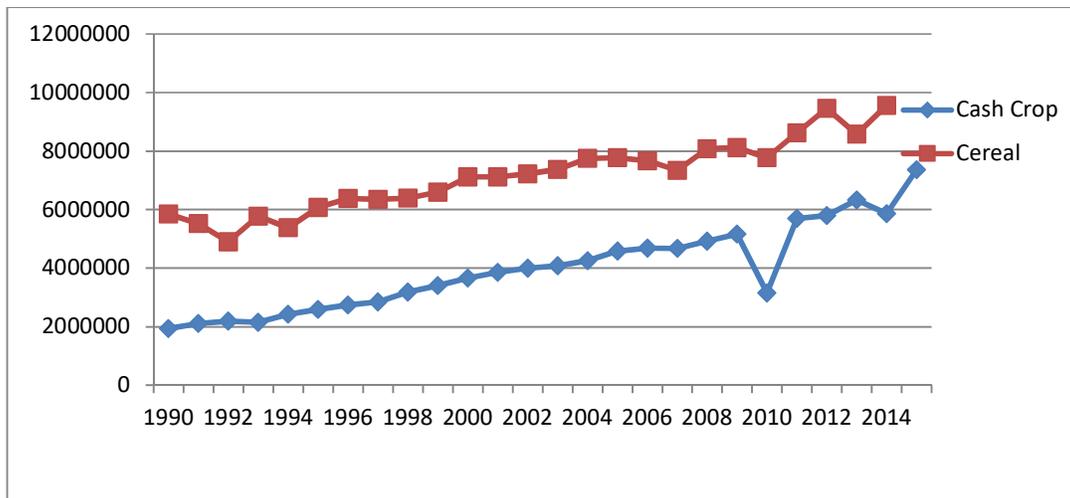
It is interesting to note that the correlation between agricultural productivity and the share of agriculture in GDP. Data shows the inverse relationship between them. Agricultural productivity per worker in Singapore is second highest in the world in 2017 (103,557 US dollar) and highest across Asia, while, in terms of sectoral contribution, this country ranks last position across the world– the share of agriculture in GDP is 0.04 percent. The case is opposite for Nepal. Agricultural productivity per worker is lowest across Asia (440 US dollar) and share in GDP is highest in Asia. This implies that agrarian economy usually faces low productivity and needs transformation to have higher GDP.

ii. Situation of Cereals and Cash Crop Production

The average annual growth rate of cereals such as rice, maize, millet and wheat during 1990-2014 is 2.3 percent, while the growth rate of cash crop for the same period is 6.1 percent. The proxy for cash crop includes the total productions of 3 major cash crops: potato, sugarcane and oilseeds. Other cash crops such as jute, tobacco and silk are also in declining phase and their volume very low. Hence, they are not accounted in the data. During the process of economic transformation, the production of cash crop rises heavily and this replaces the cereals production. The volume of cash crop production is

significantly lower than the cereals in Nepal. Figure 2 shows that both are in increasing trend. The growth rate of cash-crop is not significantly higher than the cereals. This indicates that the pace of economic transformation in Nepal is slow.

Figure 2: Trend of Cereal and Cash-Crop Productions



In total agricultural output, food crops account for about 40 percent, live stock and fishery about 30 percent, horticulture and cash crops accounts for about 20 percent and forestry about 10 percent (MoF, 2013). Around 82 percent of land is planted with staple crops but the contribution is only 40 percent of total agricultural production. The cereal yield in 2014 is 2747 Kg per hectore, which is lowest in Asia after Pakistan (Briones and Felipe, 2013; Table 2). Agricultural Development Strategy, 2014 mentions that around 44.7 percent of agricultural entities are commercialized and 55.3 percent entities are subsistence farming.

iii. Food Import and Export

The growth of food production is not satisfactory in Nepal. The cereal production per hector is 2747 Kg. This is lower than other South Asian countries. As Table 2 shows, food import has been continuously growing, while export has declining trend. The low production of cereals led huge trade deficit. In fiscal year 2075/76, import of cereals was 2800 times higher than the export. The situation indicates that agricultural development in Nepal is not in expected pace.

Table 2: Food Imports and Cereal Productivity

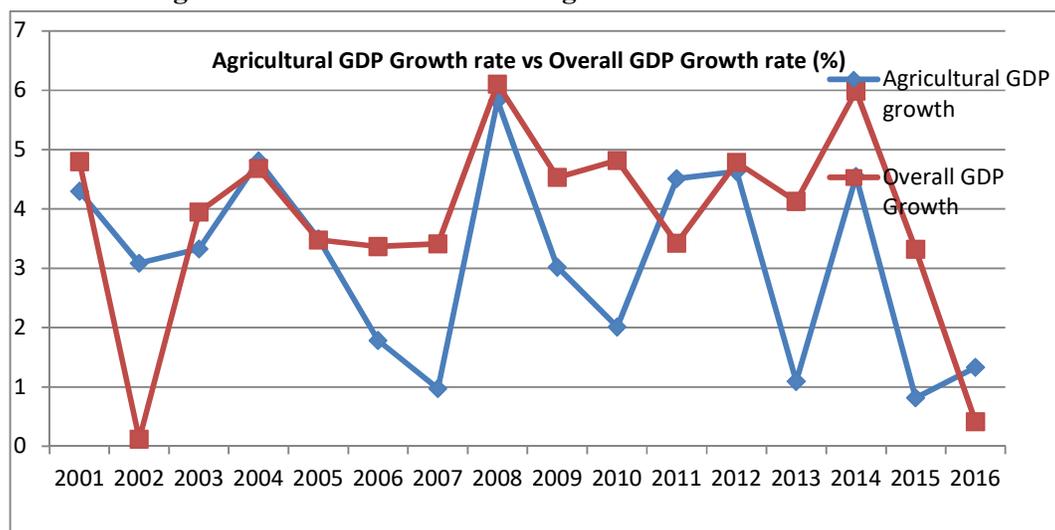
year	ARM Export (% of Merchandise Export)	ARM Import (% of Merchandise Import)	Food Export (% of Merchandise Export)	Food Import (% of Merchandise Import)	Cereal Production (Kg/per Hectre)
1975	39.78	0.001	22.56	2.93	1789.6
1980	48.01	0.59	21.39	4.33	1687.1
1985	5.60	2.20	35.08	13.98	1659.1
1990	3.01	7.03	13.23	14.82	1920.1
1995	1.11	2.91	7.80	12.20	1891.3
2000	0.45	3.80	9.91	12.61	2136.3
2003	1.07	4.61	20.59	17.28	2200.9
2010	3.93	1.88	20.20	14.15	2289.9
2015	3.10	1.79	26.89	18.30	2747.9*

ARM = Agricultural Raw Material

**means value in 2014*

iv. Trend of Economic Growth and Agricultural Growth Rate

Over the past 45 years, the average growth rate of agriculture never remained more than 6.1 percent. Figure 3 shows that the average growth rate in this sector remained lower than the overall GDP growth over the years 1980-2016. Before and after 2001, there is no difference between the average growth rates of agriculture sector. It shows nearly 3.1 percent. But, the average growth rates of GDP before and after 2001 are 4.5 percent and 3.8 percent, respectively.

Figure 3: GDP Growth rate in Agriculture and Overall sector

Source: WDI, World Bank

The growth trend of agricultural sector and overall GDP imply that agricultural sector in Nepal is not satisfactory in generating income. The productivity in this sector is low this is due to lack of proper agricultural sector. This means the existing policy of agricultural transformation is not sufficient to accelerate growth of GDP.

4. Conclusion

Agricultural transformation involves various sequential steps comprising shift from staple crops to high value crops, timely supplying of high-value added and quality products, and interlinking the agricultural productions to processing industry and the market. But this study reveals that shift from staple crops to high value crops are very slow. The average annual growth rate of cereals such as rice, maize, millet and wheat during 1990-2014 is 2.3 percent, while the growth rate of cash crop (potato, sugarcane and oilseeds) for the same period is 6.1 percent. The cash crops contribute around only 20 percent of the total output. The productivity of agricultural sector is very slow. This is due to the engagement of majority of farmers in low-value products. One percent employed worker generates only 0.44 percent of value addition in GDP in agricultural sector, while they contribute 1.6 percent in industrial sector and 3.27 percent in service sector in 2008.

During the course of development, productivity between agricultural sector and industry sector or service sector narrows down. This does not seem to be true for Nepal. The gap between agricultural productivity and industrial productivity was highest in the 1990s but gradually declined while coming to 2001. This decline was not due to rise in agricultural productivity; rather it was due to fall in industrial productivity. The growth rate of agricultural sector is less than the growth rate of GDP. Even the growth of food production is not satisfactory in Nepal. The cereal production per hectare is 2747 Kg. This is lower than other South Asian countries. This has resulted persistent food import and declining export.

The study has important policy implication for growth policy reform. Sustainable growth of economy under agriculture transformation still lacks behind unless the country focuses on the production of high value products and interlinks them with industrial processing.

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