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Economic Development Prospective Dairy Industry in Nepal: A Review

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***Abstract*---*This paper is review of Dairy related income in Nepal throughout several research paper that had published in some national and international articles, Nepal is one of Agriculture based country and still least developing country. It has huge potential to grow in various way one of the sector is Dairy Industry. Huge demand of dairy product like Milk, yoghurt, cheese. Dairy Industry of Nepal is lack of good quality and not modernized and its cause huge loss in economy of Nation. After reviewing the article, it is suggested that Nepal has wide range of economic potential in Dairy Industry. However, due to lack of traditional farming, lack of milk product commercialization and poor planning execution makes left behind the development of Diary sector development in Nepal.*

Keywords*---*workload pressure, person-job fit, creativity, innovation trust.

I. Introduction

Nepal is one is one of the landlocked country and agriculture based country. It lies between two grater countries India and China even though Nepal still least developed country. Nepal has great potentiality to grow in economy but due to poor government policy implementation and lack of skill and less using modern technology makes far behind in economic development. Mostly, Nepalese citizen 80% (approx.) depend on the agriculture sector. In Economy of Nepal through Dairy related product like Milk, curd, cheese, butter and yoghurt contribute in National Economy. Additionally, consumption of dairy products in Nepal is quite high than compare to other product. Similarly, this nation has several culture and festival and in these festival most of people using dairy product and for daily life too.

Livestock is an integral component of farming systems in Nepal; it contributes about12.8% to the total national gross domestic product (GDP) and 31.5% to the agricultural GDP. It is estimated that the livestock share of agricultural GDP will reach 45% by the end of 20 years of the Agricultural Perspective Plan (APP) program me that is by fiscal year 2014/15. The major components of livestock GDP are milk and milk products from buffalo and cattle (32.7% and 24.7% respectively). At present, the total annual milk production of Nepal is just over one million tons (70% from buffalo and 30% from cattle). Based on this figure, the per capita milk consumption over the country is about48 l/year or approximately 130 ml per day. The average growth rate of milk production from 1985 to 1995 was 2.4% and the population growth rate 2.9%. This gap is likely to increase in the future unless serious efforts are made to improve dairy production and marketing.

This research tried to review all of previous and current research in the sector of Dairy production and its economic development aspect in Nepal. This review paper used descriptive analysis to review the previous resources. The demand of milk products and their economic evaluation has been projected based on this past and current information throughout current available data and research paper. In Nepal Nepal Dairy Development Corporation (DDC) is one of the bulk Dairy product company of Government of Nepal and rest of private sector are also producing milk product of their capacity and quality.

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Fifty percent of Dairy product is produced by DDC and rest of private though private has so small large amount of production but the demand of milky product increasing day of day in the Nepalese market rapidly. This review emphasized to potential aspect of economic development in this research.

II. Previous Research

The study involved research addressing to income comparison of dairy product of Nepal. This research insight to relevant potential to looks toward economic development possibility in Nepalese Daily Industry. This industry can enhance provide economic sustainability in National economy. The demand of Dairy product; Butter, cheese, Milk and yoghurt rapidly increasing in the domestic market as well as Nepalese market. Since decade Nepalese dairy market moving very traditionally way and as a result domestic market facing lack of Supply as compare to demand. Modern Milk production technology might be installed and it can be economically and as well as the supply of Dairy product in the market will efficient and it is one of vital challenge in country economy sector.

According to the recent trade patterns and their likely future, Asia is and will remain a large net importer of dairy products (Dong, 2005; Podbury et al., 1995; Rae, 1997; Rutherford, 1999). Many Asian countries suffer from one or more factors hindering their competitiveness in dairy (tropical climate, land and feed scarcity, labor cost, transaction/ transportation costs). These handicaps explain their net dependence on world dairy markets. This stylized fact is likely to remain valid in the future even if Asia dairy production becomes much more productive (Dong, 2005). These aggregate patterns dissimulate various levels of competitiveness within the Asian continent. Countries' competitiveness levels are also conditioned by distortions affecting world market prices (Kehren and Tisdell, 1998; Peng and Cox, 2005; Podbury et al., 1995; Rakotoarisoa and Gulati, 2005). Peng and Cox (2005), and Rakotoarisoa and Gulati (2005) find that India could be a competitive exporter under world prices that would prevail if Asia liberalized its dairy trade.

Being with neighbor of India and China both nation have wide range of Dairy production with high tech mechanism and they export in several country including Nepal. Nepal also have high potential to develop Dairy market because Nepal has wide range of grazing farms and suitable climate to flourish the Milk market. Nepali farmer has high income opportunity from these sector but it need modernization skill and modern training. It is one of big challenge in Nepal that Nepal government still lack of modernization and commercialization. This Industry has highly income possibility to grow and contribute in economic development.

DDC is engaged in commercial activities of collecting milk from rural areas, processing it to milk and milk products and distributing them to urban consumers. It is also the leading agency of fixing the price of milk and milk products. The main problem facing DDC is the shortage of good quality raw milk whereas demand for its milk and milk products in the urban areas is increasing. In an effort to fulfilling the increasing demand of milk and milk products, DDC has expanded its milk collection network in distant rural areas. However, DDC is not engaged in executing neither milk production programs by providing technical as well as financial supports to the rural milk producers nor milk quality improvement programs in its milk shed areas these are several difficulties faced by Nepalese Milk farmers.

III. Review Remarks of Income Potential of Dairy Industry in Nepal

Milk production in Nepal

When we see the Nepal Milk production is simultaneously increasing each year which is positive sign that the involvement of farmers and their interest are growing rapidly.

Table 1. Milk Production in Each Year

Milk production in Year	Total Milk production (Mt.)
2001/02	1,158,780
2002/03	1,195,931
2003/04	1,231,853
2004/05	1,274,228
2005/06	1.312,140
2006/07	1,351,394
2007/08	1,388,730
2008/09	1,445,419
2009/10	1,495,897
2010/11	1,556,510
2011/12	1,622,751
2012/13	1,680,812
2013/14	1,799,073
2014/15	1,755,725
2015/16	1,854,247

Source: Statistical information on Nepalese Agriculture 2015/16

The production table of milk depicts that the milk production in increasing each year rapidly and one of the important sign is that if Nepalese famers god rid of traditional system and they could adopt the modern way of training then milk production will be higher as well.

IV. Milk Consumption in Nepal

Fluid milk consumption among households in urban areas is widespread. About 88% of urban households consume fluid milk regularly and another 7% occasionally. The average quantity purchased is 1.03 litres/day per household, with 1.1 litres in the Hill and 0.9 litres in the Terai regions. However, the habit of drinking milk regularly has not yet been developed in Nepal. Milk has drunk regularly by family members of less than 20% of households. Even among children, the percentage of regular consumers of milk is low at 18%. In urban areas, the use of milk for tea is popular; about 94% of households use milk for tea whilst 60% drink it as milk. Additionally, dairy product consumption is getting higher each year.

Demand and Supply of Dairy Products

The DDC gradually established various milk supply schemes to meet the growing demand for processed milk and milk products. The Biratnagar City Milk Supply Scheme was established in 1973, the Hetauda City Milk Supply Scheme in 1974, the Kathmandu Milk Supply Scheme in 1978, the Cheese Production and Supply Scheme in 1979 and the Pokhara City Milk Supply Scheme in 1980. The schemes were involved both in milk collection and processing of milk products. In 1989, many of the schemes of the DDC were rehabilitated with assistance from the Danish International Development Agency (DANIDA). Dairy plant capacities were increased from about 74 thousand to about 180 thousand liters per day after the rehabilitation. In 1990, the Ten-Year Dairy Development Plan for 1991–2000 (TYDDP) was designed (DANIDA/MoA 1991) and approved. As recommended by the TYDDP, a skim milk power plant was established in Biratnagar City in 1991.

At present, the DDC has a milk collection network in 36 districts throughout the country. The amount of milk collected annually by the DDCfor the years between 1989 and 1998 is shown in Figure 1. The DDC and private sectors are involved in collection and processing of milk supplied from the rural areas; their respective shares are roughly 50:50. The milk sheds have over 900 Milk Producers' Co-operatives (MPCs) with approximately 100 thousand producers. There are as many as 75 thousand farm families supplying 214 thousand liters of milk per day to collection centers. Each farmer supplies about 3 liters of milk/day. Approximately 50% of the milk produced in Nepal is produced in districts within the existing DDC grid. Current chilling capacity in the milk grid is approximately 320 thousand liters each day. The formal sector collects about 20% of the milk produced in the existing four milk sheds. The private sector share in the market has been increasing steadily. It was less than2%in 1980. Presently, the private sector share has reached 46% with a yearly growth of about15%. However, the private share involvement is mostly (72%) in the central region.

Milk Pricing System in Nepal

The pricing system established by HMG Nepal is based on content of fat, solids-not-fat (SNF) and total solids (TS) in the milk. The average milk-pricing used during the lean and flush seasons of the year 2000.

Table 2. Milk Pricing in Nepal

Component	**Price (overall average)**
Milk fat (per kg)	151
SNF (per kg)	104
TS (commission to co-ops/kg)	15
TS(commission/liter of milk)	1.95
Price/liter of milk to farmers	16.37
Total cost/liter of milk	18.32

Source: DDC,1999

To secure sustainable development of the Nepal dairy industry it is imperative to give quality improvements a very high priority and to implement the necessary tools. In the year 1999, Nepal producers of buffalo milk (5.5% milk fat and 8% SNF) received NRs 15 per liter, equivalent to US$ 0.21/kg. The DDC retail price for milk in Nepal is NRs 20 per kg for standardized milk containing 3% fat, representing a margin of NRs 5/liter (US$ 7/kg).

Future demand and Supply of Milk

The institutional demand for fluid milk in urban areas is 226 thousand liters/day; the DDC supplies 46%, the private sector 31% and the farmers 23%. Demand for milk products varies by season and is influenced by festival periods. Eighty per cent of ice cream consumption and 65% of yoghurt consumption occurs in the summer months. The regional distribution of processing plant capacity. In 1999, the National Dairy Development Board (NDDB)/DANIDA Support Project (DSP) conducted a benchmark survey of quality of milk and milk products in Nepal. The survey included the major milk processing and marketing areas of the eastern, central and western regions of the country and covered the milk chain, from the farmers to the retail outlets in the market place. The milk chain included smallholder farmers, milk co-operatives, traders, chilling centers, processing plants and the market. Quality checks were carried out for raw milk, pasteurized milk, cream, butter, ghee, cheese, paneer, ice cream and *dahi* (youghurt).

Estimated Income of Dairy Industry in Nepal

The above table shows that the Margins in dairy products.

Table 3. Cost Revenue and Margin of Dairy Products

Particular	**Approximate cost/Kg (NRS)**	**Consumer price/Kg**	**Gross Margin (NRS)**	**Tax and Commission (NRS)**	**Net Margin/Kg**
Yak cheese (Kg)	360	500	140	105	35
Kanchan Cheese (Kg)	286	400	114	85	29
Mozzarella cheese (Kg)	199	300	101	80	21
Yoghurt (lt)	60	75	15	11	4
Ice-cream (lt)	70	150	80	64	16
Butter (Kg)	250	400	150	100	50
Ghee(lt)	295	400	105	76	29
Paneer(Kg)	200	300	100	80	20

Source: DC, 2008/09

The above analysis shows that the DDC's administrative overheads are much higher than other costs mainly due to depreciation, which is non-cash cost. Although the amount of depreciation is shown on the book of accounts, there is no separate depreciation fund. Similar is the case with gratuity which also is only the provision but not the actual payment to the employee. Thus, about NRs. 6.94/liter is the non-cash cost of the DDC; and the margin in the processed milk without these comes to be a surplus of NRs. 5.43/liter for processing locally collected milk (excluding SMP and butter cost) and NRs.

2.23 for processing milk including reconstituted milk. Actually, the DDC's operation is sustained by these non-cash costs. Although the DDC has some margin on its other milk products their share in total revenue being only about 20 per cent this margin is not enough to compensate the loss in processed milk. According to the available information, DDC has incurred a loss of about NRs.10 million in 2008/09.

Table 4. Estimated Revenue and Margins of Milk Plant

	Product Quantity (kg/day)				**Annual Revenue (NRs.'000)**		
Products	**10000 liter capacity**	**30000 liter capacity**	**100000 liter capacity**	**Price**	**10000 liter capacity**	**30000 liter capacity**	**100000 30000 liter capacity**
Processed Milk	9,050	27,150	90,500	38	125,524	376,571	1,255,235
Butter	110	330	1,100	330	13,250	39,749	132,495
Ghee	113	339	1,130	440	18,148	54,443	181,478
Yoghurt	200	600	2,000	75	5,475	16,425	54,750
Ice-cream	70	210	700	200	5,110	15,330	51,100
Paneer	40	120	400	300	4,380	13,140	43,800
Total					**171,886**	**515,657**	**1,718,858**
Less: Tax @15%					25,783	77,349	257,829
Net Revenue					**146,103**	**438,309**	**1,461,029**
Operating cost					133,583	398,789	1327918
Estimated Profit					**12,520**	**39,520**	**133,111**

Source: Consultant's estimation of DDC

In above table depicts that the projected income of Dairy**.** The product mix of a milk processing plant is composed of processed milk, butter, ghee, yoghurt, ice-cream and paneer because of high market potentiality of these products in the urban areas. Depending upon capacity, the milk processing plants are estimated to generate a margin of NRs. 12.52 million, Rs. 39.52 million and NRs. 133.11 million for small, medium and large milk processing plants, respectively. It shows that margin on dairy product is pretty much good and market of this industry is profitable.

V. Conclusion

Nepal is Agriculture based country. The country which is facing abundant trade imbalance and seeking the alternative solution toward economic development. One of the alternative source to generate the good income source of the Nation is Dairy Industry which carry huge potential sector in Nepal. Nepal has one of the perfect climate for livestock though due to

the lack of good skill, still keep traditional way of production are the main reason Dairy Industry has not been developed yet. Most of people till today depend on still Agriculture dependency. In fact, Nepali Dairy Industry has not developed as per demand of the modern Nepalese market. This Industry carries huge potential to provide employment and country economic development directly and indirectly. Thus, Nepal government should need to see this Industry can be part of National Economy as like New Zeeland, India and Australia as they make more commercialization of their dairy industry.

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