



Dairy Movement with Cooperative Societies in India

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Abstract: India has the credit of being the largest producer as well as the biggest consumer of milk in the world. It also has the world's largest dairy herd (comprised of cows and buffalos). India's milk production accounts for 17% of total global output. The dairy industry is expected to grow 4-5% per annum.

In this paper an attempt has been made to capture the overall scenario and success way of milk industry in India. We take hypothesis that rural population plays a vital role in the success story of milk production in India, as the higher the rural population, the better quantity of milk yield. The scenario of Uttar Pradesh, being the largest producer of milk has been seen with perspective of per capita availability of milk. The problems and potential of this sector has been analysed and accordingly conclusions have been derived.

India has the world's largest dairy herd and is also the biggest milk producer. International ranking of India shows that in 2009, India has 281,700,000 cow stock and buffalo milk output of 56,960,000 tons. The National Dairy Development Board estimates that 127 million tonnes of milk were produced in 2011-12-about 17 percent of the global total.

Dairying in India is by large in the hands of small/marginal landholders and agriculture labourers. The national average land holding is 1.68 hectares per farm family and cattle and/or buffalo is a part of family. Eighty per cent of 97.7 million farm families in India possess cattle and/or buffalo. Even agriculture labourers, (11.5% of 97.7 million) possess one or two dairy cattle /

buffalo. Owing to the infrastructure developed by NDDB and state federations for procurement of milk, processing and marketing, the member producers are paid based on fat and SNF content of milk. The farm family for all inputs on crop production, education, health etc. uses this earning as the seed money. Thus, cooperative dairying has changed the lifestyle of farm family. Livestock keeping in general and dairying, once a subsidiary enterprise, (Supplementary / complementary) to agriculture, has now become the major enterprise economically and the crop production are becoming dependent on dairying.

Production and Consumption of Milk- Among various livestock products,

milk constitutes the major share (68%) in value of outputs from the livestock sector) and is the single largest commodity contributing to the value of output from agriculture. Milk production is the most important agricultural activity in the Indian agricultural sector. At the national level, around 17% of the total value of agricultural production is derived from this sector. Its importance is further highlighted if the closely linked other livestock (meat, poultry, wool, and hair, etc.) sub-sectors (accounting for a further 8.3%) are also taken into consideration. The milk sector generates a high proportion of agricultural output, especially in the northern and western parts of the country.

Table-Milk Production in India

Year	Production (Million Tonnes)	Per Capita Availability (grams / per day)
1991-92	55.6	178
1992-93	58.0	182
1993-94	60.6	187
1994-95	63.8	192
1995-96	66.2	195
1996-97	69.1	200
1997-98	72.1	205
1998-99	75.4	210
1999-2000	78.3	214
2000-01	80.6	217
2001-02	84.4	222
2002-03	86.2	224
2003-04	88.8	225
2004-05	92.5	233
2005-06	97.1	241
2006-07	102.6	251
2007-08	107.9	260
2008-09	112.2	266
2009-10	116.4	273
2010-11	121.8	281
2011-12*	127.9	291

Anticipated achievements

Source-Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, GOI Dairy development in India has been acknowledged the world over as one of modern India's most successful developmental programmes. Dairy industry in India has witnessed a remarkable journey in last few decades. From being a laggard and net importer of dairy products in 1950s and 1960s, India has covered a lot of ground. India now is world's largest producer of milk (approximately 127 million tonnes annually) and a net exporter of milk products. The credit of this transformation is largely attributed to "Operation Flood", a co-operative led movement started in 1970s which took in its fold millions of small holding farmers who joined the three-tier co-operative structure (constitutes- village societies, district unions and state federations) and increased India's milk output at a compounded annual growth rate (CAGR) of 4.7% since 1969, up from a 0.7% CAGR from 1947 to 1969.

Vergheese Kurien was a renowned Indian social entrepreneur and is best known as the "Father of the White Revolution" for his 'billion-litre idea' (Operation Flood) - the world's biggest agricultural development programme. The operation took India from being a milk-deficient nation, to the largest milk producer in the world, surpassing the United States of America in 1998, with about 17 percent of global output in 2010-11, which in 30 years doubled the milk available to every person. Dairy farming

became India's largest self-sustaining industry.

The matters relating to livestock production, preservation, protection, and improvement of livestock & dairy development comes under Department of Animal Husbandry, Dairying & Fisheries of the Ministry of Agriculture, GOI. Value-added products like whole milk powder, skimmed milk powder, condensed milk, ice cream, butter and ghee have immense potential for export.

As per the latest statistics of National Dairy Development Board (NDDB), the dairy cooperative network in the country includes 177 milk unions covering 346 districts and over 133,000 village-level societies with a total membership of nearly 14 million farmers. All the statistics given above are indicators of a flourishing dairy sector in India providing suitable opportunities to the industries engaged in the dairy business.

Fig.

INDIAN DAIRY INDUSTRY AT A GLANCE

Size of the Industry	More than 14 million dairy farmers belong to 96,000 local dairy cooperatives, who sell their product to one of 177 milk producers' cooperative unions who in turn are supported by 15 state cooperatives
Geographical distribution	Delhi, Punjab, Maharashtra, Gujarat, Uttar Pradesh, Bihar, Andhra Pradesh
Output per annum	Growing 5 % per annum
Market Capitalization	The industry contributes about Rs.1,15,970 crores (US \$ 25,771 million) to the national economy.

Source National Dairy Development Board, Report 2012

The milk surplus states in India are Uttar Pradesh, Punjab, Haryana, Rajasthan, Gujarat, Maharashtra, Andhra Pradesh, Karnataka, and Tamil Nadu. The manufacturing of milk products is concentrated in these milk surplus States. The major milk producing states are UP, Punjab, Rajasthan, M.P, Maharashtra, and Gujarat. Numbers of milk products manufacturing plants have come up in these states for processing of milk.

The major milk producing States in the country are Uttar Pradesh, Punjab, Rajasthan, Madhya Pradesh, Maharashtra, Gujarat, Andhra Pradesh, Haryana, Tamil Nadu, and Karnataka, accounting for about three-fourths of total milk production in the country. Uttar Pradesh is the largest milk producing state, producing about (22.55 million tons) of milk, followed by Rajasthan (13.51 million tons), Andhra Pradesh (12.08 million tons), Gujarat (9.81 million tons), Punjab (9.5 million tons), Maharashtra (8.4 million tons), and Madhya Pradesh (8.1 million tons) in 2011-12 (GOI, 2013). Gujarat-the cradle of India's White Revolution-has beaten Punjab in milk production by emerging as the fourth largest milk producing state of India, world's largest milk producer. Earlier, Punjab enjoyed the fourth rank in terms of milk production. The latest milk production data has revealed that Gujarat's milk production has risen to 269 lakh kilograms per day pushing Punjab to fifth position with 261 lakh kilogram per day worth milk production. Uttar Pradesh,

Rajasthan and Andhra Pradesh have managed to retain their position as top three milk producing states.

Among the top five economies of India - Maharashtra, U.P., A.P. Tamil Nadu and Gujarat, the major producer of milk are these three states. The high milk production in these top three states is directly correlated to their rural population, higher the rural population-higher the milk yield. Data shows-77.72%, 75.11%, and 66.51% population resides in rural areas in U.P., Rajasthan and Andhra Pradesh respectively and their milk production is major contribution to country's total production. While Gujarat and Punjab are fourth and fifth largest producer states in India and their rural population is 57.42% and 62.51% respectively. Therefore, our hypothesis is supported by the data shown, it is proved that their rural population plays a significant role in milk production.

The present level of per capita availability is well below the world average of 285 grams and also less than the 220 grams recommended by the Nutritional Advisory Committee of the Indian Council of Medical Research (ICMR). It remains well above the average for developing countries and is even higher than some countries that exhibit higher average GDP.

If we compare the GDP growth rates of these top five milk producing states with the per capita availability of milk, we find the Punjab is the topmost consumer with 937 grams of milk per individual, whereas their GDP growth is 7.04 % in 2010-11, while the largest producer of milk, Uttar

Pradesh whose GDP is 7.86% but the per capita availability of milk is just 289 grams. It is surprising the highest contributing state is unable to provide milk sufficiently, although marginally better than national average of 281 grams.

Scenario in Uttar Pradesh- Uttar Pradesh (UP) is India's most populous state, as well as the world's most populous sub-national entity. It is the second largest state economy in India. UP is the largest contributor to the national milk production contributing around 18% of total milk production in the country. It has got the second highest cattle population and highest buffalo population in the country. Majority of the rural population of the state is engaged either in the livestock breeding or dairying in one way or the other. Thus, the contribution of livestock to agricultural income is 30% in the state. The state is also equipped with a vast network of infrastructure and organizations existing in the dairy sector. Most important and nodal agency of dairy development in the state is Pradeshik Cooperative Dairy Federation established for achieving multiple objectives of increasing milk production; processing and marketing of milk/milk products and development of infrastructure to promote dairy industry within the state.

The per capita consumption of milk in many parts of the country is low compared to minimum nutritional standards and to that of many developed and developing countries. The demand for milk and dairy products is income-elastic, and growth in per capita income is expected to

increase demand for milk and milk products. Empirical evidenceshows that the composition of the food basket of an average Indian is gradually shifting towards livestock products (Radhakrishnan and Ravi, 1990; Kumar, 1998). Other socioeconomic and demographic factors such as urbanization, changing food habits, and lifestyle also reinforce growth in demand for dairy products. Domestic consumption of milk has remained more or less equal to the domestic production of milk. Milk consumption varies widely across regions and economic groups, and between urban and rural households. Liquid milk comprises the largest single share of the dairy product consumption profile. The share of fat-based products like ghee showed a declining share, and that of western products like cheese and ice cream witnessed an increasing trend and is expected to increase further due to changes in food habits, marketing strategies, income levels, changes in demographic factors, etc. Further increases in per capita income and changing consumption patterns would lead to acceleration in demand for milk and other livestock products in India and is thus expected to give a boost to this sector. Radhakrishna and Ravi (1992), Gandhi and Mani (1995), Kumar (1998), Dastagiri (2001) and many others have also estimated demand and income elasticity of demand for milk and milk products, which show similar patterns.

Production and Marketing of Milk- Impressive work has been done under the guidance of the National Dairy Development Board under " Operation

Flood " programmes for organizing dairy production, processing and marketing of milk and milk products by the cooperative dairy sector following the well-known "Amul" model- a three tiered cooperative structure of village level dairy cooperative societies, a district level cooperative milk union and a state level cooperative milk marketing federation where the profits are shared by the farmer members.

Most of the milk in India is produced in villages. Quantity of milk produced per household is very small. About 56% of milk is available as marketable surplus for urban areas. Liquid milk comprises the largest single share of the dairy product consumption profile.

Fairly large quantity of milk is converted to local milk products (khoa, paneer, butter, ghee etc). The share of organized sector is small (private-11-12%, Government/cooperative sector - 11-12%). There is still a very large portion of milk market in the hands of unorganized sector. In government/cooperative sector, almost 80% milk is marketed as liquid milk and only 20% as milk products. While it is reverse in the private sector - only 30% is marketed as liquid milk and 70% as milk products with value addition. In absence of properly developed infrastructure for preservation of raw milk in local areas many plants in Govt. sector collect fresh raw milk from the far-flung rural areas (each producer having very small quantities) twice a day, send it over a long distance to towns for processing, incurring high cost on transportation. This erodes the profitability.

As a result, many plants have become uneconomical, non-functional or they are working much below their potential capacities. Alternative strategies need to be developed to store raw milk in bulk coolers in the rural area and transport it in bigger volumes at longer intervals. There is also a need to use alternative and cheaper energy sources to store cool milk, and develop rural markets so that much of the milk produced in the rural areas finds Consumption Avenue in the nearby local markets,

Suitable technologies and model projects for several dairy products have been developed by institutions like NDDDB Anand, NDRI Karnal, NDRI Bangalore, and CFTRI Mysore etc. NABARD has prepared and circulated to banks suitable techno-economic model schemes.

Like all developing countries, India has co-existing "organized" and "unorganized" sectors for the marketing of milk and dairy products. Sometimes called the "informal" sector, the unorganized sector may be more usefully thought of as the traditional milk market sector, comprised of the marketing of raw milk and traditional products such as locally manufactured ghee, fresh cheese, and sweets. The dairy cooperatives comprise the single largest formal organization in terms of market share, and its share in total milk procurement has increased over a period and is further expected to rise in the future. There are large regional variations in the types of operators and their operating procedures. Cooperative milk marketing has a relatively strong hold

in the states of Gujarat, Rajasthan, Maharashtra, Tamil Nadu, and Karnataka, yet is subservient to unorganized sector. Dairy cooperatives have a particularly low profile in the eastern and northern parts of the country. By and large, the informal sector comprising private milk vendors, traditional dudhias/halwais, and others continues to have the lion's share of the procurement and marketing of milk in India. This situation is unlikely to undergo a major shift, given consumer preferences. The informal sector is a large employment provider and has traditionally offered a wide range of services to households and institutional consumers. In metro cities - Delhi, Mumbai, Chennai, and Kolkata- the introduction of bulk vending machines has given a strong advantage to cooperatives. With more focus on global trade and quality standards, the organized sector (cooperatives and the private sector, including multinationals) can be expected to play a greater role than at present. At some point in the future, it might handle about 25-30% of the total milk produced in the country yet leaving the major share of milk procurement and marketing to the informal sector. This will require an increased willingness by consumers to pay for the additional processing. Hence, the informal sector has a major potential role to play in milk procurement and marketing in India (Sharma, Singh, Staa, and Delgado, L 2012).

The number of farmer members in cooperative s has risen to 14 million. The Anand pattern multi-tier cooperatives have

strong backward linkages with the farmers and collect milk from rural producers through village dairy cooperative societies. Most private processors depend on contractors (through informal or formal contracts) and traders to procure milk from farmers. The private sector has the advantage of flexibility in pricing and in business policy decisions.

Problems- The small rural milk producers have several problems. The major problems faced by the farmers include small herd strengths, small land holdings, shortages of green and dry fodder, low productivity of animals, non-availability of timely inputs for breeding, feeding and health care of animals, lack of suitable education/training for skill development for new viable and sustainable technology, inadequate finances, poor rural infrastructure facilities and lack of proper marketing support for their produce.

With over 75 per cent of cattle located in rain-fed areas, the major issue is access to feed, fodder and drinking water which is becoming increasingly scarce. The problems of the sector are compounded by growing numbers of unproductive male cattle. Richer farmers with access to groundwater irrigation can grow irrigated fodder and increase herd size. Poorer livestock owners dependent mainly on commons and agriculture residues, end up underfeeding the animals. This problem raises questions about the present breeding strategy that focuses almost exclusively on induction of breeds that are high yielding but are much less tolerant to adverse conditions in

extensive livestock systems.

Key Challenges of Indian Dairy Industry- Although India is the largest producer of milk, but this sector has certain bottleneck at different levels from producing of milk to processing level and distribution of milk and milk product. Since majority of production is in unorganised sector therefore these challenges are major cause of hampering the production.

Small land holdings by the farmers are not giving the sufficient and good quality animal food, as they are more concern about growing cash crops. The lack of animal health care facilities with low yielding animal breeds and poor facilities for chilling and transportation to collection centres. As most producers have small numbers of animals therefore production cost is high. At collection level, milk base mainly consisting of small holders, therefore making centers at remote places is costly affair and too many intermediaries are involved so cost again goes up. There is a lack of infrastructure including inadequate power supply. The manipulation in the quality of milk done by producers and intermediaries make the quality inferior. At processing level due to lack of proper transportation, the supply is fluctuating, and seasonality also affects the supply quantity of milk. The milk pricing system must be transparent, but it is lacking.

Development Programme- In last 40-50 years, many development programmes have been taken up by the central and state Governments under the five-year development plans. The major

thrust areas in the current five-year Development Plan and the new livestock development policy laid by the Government include the following: -

- * Effective animal health and management, including control and eradication of important animal diseases and "Animal Disease information Service" for farmers.

- * Providing better quality Artificial Insemination service for breeding of animals

- * Support for activities under "Operation flood (milk) programme (OF)", including strengthening of existing viable dairies and rehabilitation of sick dairies.

- * Special integrated Dairy Development Projects for hilly and backward districts.

- * Improving database on production of milk and reproduction capacity per animal to facilitate better planning and forecasting of issues and activities.

- * Intensified research on milk products with particular emphasis on "indigenous milk products" and with reference to products suitable for the utilization of buffalo milk.

- * Encouraging milk production through commercial herds and for providing 'quality' milk for preparation of value-added products.

- * Providing adequate credit for dairy sector

- * Strengthening activities for fodder production.

- * Formation of "Cattle breeders' Associations" and State "Livestock Development Boards".

Potential for Growth- The dairy industry in India has been witnessing rapid growth with liberalization. The economy provides good opportunities for MNCs and foreign investors to utilize the full potential of this industry. The main objective of the Indian Dairy Industry is to manage the national resources in a manner to enhance milk production and upgrade milk processing using innovative technologies.

An Indian dairy industry set to grow at annual rate of 10 per cent by 2015, the sector is expected to hit US\$90 billion, according to the Associated Chambers of Commerce and Industry of India (ASSOCHAM).

The Indian dairy sector is largely unorganised {small cooperatives} because of this structure, there remain ample opportunities for branded dairy products, and it is penetrating a small but steadily growing, organised sector.

National and international players like Amul, Nestlé and Britannia, local brands, and state government cooperatives such as Verka and KMF [Karnataka Milk Federation] will become major challengers. These players are better positioned to procure milk from village centres.

Dairy products are the top-ranked commodity in India accounting for 17 per cent of the total global production, reported by ASSOCHAM. High per capita consumption due to rising population and increasing disposable income are driving the growth of this industry, also, increasing health-consciousness among Indians is boosting the demand for healthy products,

which will further drive the industry in the coming years. But being able to cater for local tastes is a key factor for foreign dairy groups trying to build market share. Companies can gain competitive advantage with the introduction of new value-added products like yogurt and fermented milk products.

Urban, health-conscious shoppers are also looking for new alternatives, according to market-watchers. Soya-based beverages are still a niche market among affluent urban consumers, but soya milk performed very strongly, registering 14 per cent growth last year with the support of new product developments.

Factoring all this growth supplements, the industry to be in the pink of its health in the near future and would be soaring to new heights. Indian Dairy industry currently pegged at USD 47 billion will jump to reach USD 67 billion by 2015.

Conclusion- Operation Flood was a key element in the transformation of India into a self-sufficient milk producer, and even into a milk exporter. By pointing the way to the use of production-enhancing technologies, establishing more effective and efficient supply chains, and orienting producers toward markets, Operation Flood helped promote a more productive Indian dairy industry. Milk is now big business in India. As of 2007 India was the largest milk producer in the world, and milk was a bigger contributor to the country's gross domestic product than rice. At least 20 percent of India's agricultural economy is composed of dairying, and about 70

percent of the rural population is somehow involved in milk production. The growth in production has made milk increasingly available to consumers, providing an important source of nutrition for millions of people.

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