

DAIRY INDUSTRY IN INDIA: DEVELOPMENT AND CHALLENGES

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Abstract: The current study development of dairy industry and its challenges. The government of India has started various dairy development programs like Operation Flood largest rural development programme in the world, Intensive cattle development programme and key village scheme for the development of Indian dairy. Indian dairy development and have played important role in becoming self-sufficient in dairy production. Although India is self-sufficient in dairy products, its dairy industry is facing challenges we have to overcome it through systematic approach and planning.

Keywords: Development of Dairy Industry, Operation Flood, Self-sufficient, Challenges.

I. INTRODUCTION:

The Indian dairying has made fast progress since independence. Indian dairying has been practised as rural cottage industry since the remote past semi-commercial dairying started with the establishment of military dairy farm and cooperative milk unions through the country towards the end of ninety century. During early 1920's military dairy farms were established for an adequate supply of milk to army stations. These farms were well maintained and even in their early stages were raising improved milch animals. Elsewhere in urban areas, dairying was largely left in the hands of traditional producers, middleman and small producers, dealers and milk and milk product vendors. To some extent, World-War-II gave impetus to private dairies with metropolitan cities such as Bombay, Calcutta and Delhi and some other larger townships could claim of making available processed milk, table butter and ice cream, though not on large scale. In India, market milk industry started in 1950-51 when central dairy and AERY milk colony was commissioned and with the establishment of AMUL dairy, Anand in 1956. India is the largest milk producer in the world. It sustains the first position in the milk production for last two decades. The dairy industry in the country also has undergone considerable transformation may be due to the application of scientific production techniques. Dairy sector today provides benefits of nutritive food, supplementary income and provide employment for family labour, mainly for women. Dairying with crossbred cattle and high yielding buffaloes has become a lucrative business. Milk processing has now become a profitable business on low margin high volume basis. The organized milk marketing has gone up from one million tons in the early seventies to 30 million tons annually presently. This is an explosive growth. About half of the milk processed in the organized sector is now handled by the private sector. Its growth without any government assistance demonstrates that free market of this sector. By considering all the facts the present study was carried out with the following objectives.

- Objectives:**
1. An overview of the development of Indian Dairy Industry.
 2. To understand the challenge faced by the dairy sector units.

II. RESEARCH METHODOLOGY:

The above objectives are achieved by using secondary data collected from the various published reports, books and internet source. From the websites of NDDB. The collected data is analyzed to arrive at logical conclusions.

III. RESULTS AND DISCUSSION:

Dairy development under-operation flood programme:

As a result of Operation Flood (OF) project more village level cooperative societies function with millions of producer members to procure milk. These co-operatives form a part of national milk grid, which links the milk producers throughout India with consumers in towns and cities. With the completion of Operation Flood project, the pace of investment in the dairy sector has slow down. Indian dairy industry has acquired sustained growth from VII Five Plan towards achieving an annual output of over 88.1 million tons of milk. India's output has not only placed the industry first in the world but also represents sustained growth in availability of milk and milk products. The dairy sector is now the largest contributor of the agriculture sector to the national GDP. The huge increase in milk supply through concerted efforts on a comparative level is known as the white revolution. In 1965 the National Dairy Development Board (NDDB) was set up to promote, plan and organize dairy development through cooperatives. The NDDB launched Operation Flood in 1970 with commodity gifts from the European Economic Community, which included skimmed milk powder and butter oil.

The Operation flood is considered as the world's largest dairy development programme. Under this programme, professionals were employed at every level, particularly in marketing and application, and science and technology. A multitiered

co-operative structure was established under the operation with primary village co-operative societies at the base, district unions at the district level and national co-operative dairy federation of India at the apex body for milk cooperative societies. They also provide support facilities like balanced cattle feed, health services, AI and veterinary treatment backed by research in production, processing, and marketing. The programme was completed in three phases.

Phase I: It ongoing in July 1970 and ended in 1981. The objectives were to set up dairy co-operatives in 100 milk sheds in ten states, so as to link them with the four best metropolitan markets of Mumbai, Delhi, and Calcutta. This phase operated between 1971 and 1981. By the end of phase-I, 13,000 village dairy co-operatives covering 15 lakh farmer families.

Phase II: It covered the sixth Plan periods from 1981 to 1985. Phase I and IDA assisted dairy development programme in Karnataka, Rajasthan and Madhya Pradesh. By the end of phase-II there were 136 milk sheds, 34500villages' dairy co-operatives covering 36 lakh members. This phase linked 136 rural milk shed to 148 cities and towns and established a national milk grid and 15 million people were connected through this grids.

Phase III: In this phases by improving the productivity of co-operative dairy sector and its institutional base for long-term sustainability. About 73,300 dairy co-operative societies had been organized in 170 milk sheds involving over 9.4 million farmer members. Thus Operation Flood has helped to establish a White revolution in the country. It is started in 1985 and came to an end in April 1996.

Dairy development through following:



Indicators of dairy development

- Milk production in India
- Per capita milk availability
- Livestock population
- Annual growth rate value of output from GDP

Table 1. Overall achievements under operation flood programme

	1971	1981	1985	1990	1996
No. of milk shed	5	39	136	170	170
No of .DICS	1600	13300	34500	60800	70000
Former membership	2811	17.51	76.31	70.1	93141
Average milk LLPD	5.2	25.6	52.6	91.8	115
Total processing LLPD	16.8	64.9	122.8	178.2	226
Total marketing LLPD	NA	27.9	50.1	72.5	100
No. of A.I centers	NA	4.9	7.5	10.9	10.5
No. of A.I zones	NA	8.2	13.3	30.1	39.5
Investment	NA	116.54	277.17	411.59	1303.5

Source: Dairy India (1997) LLPD=Lakh liters per day.

1. Key village scheme and Intensive cattle development Scheme

This schemes implemented by Government for the development of dairy sectors of India. After Independence, the first organized attempt to develop village cattle on an effective scale was initiated with the launch of key village scheme (KVS) in 1950 during the first five-year plan. KVS is a general comprehensive scheme drawn up by Government of India for development of cattle population in India by employing scientific methods for improvement of cattle viz., Artificial insemination, Grading & selective breeding, Formulation of co-operative societies for marketing the pure breed cattle and development of feed & fodder. A key village is defined as an area or part of the village or whole village or group of villages. Initially, the aim was to cover 5000 breedable cows and buffaloes & later on increase up to 10,000.

The key village scheme thus employed all aspects of cattle improvement for e.g. controlled breeding, improved feeding, disease and health control, better management and marketing and adoption of improved animal husbandry practice through proper extension methods. KVS thus has helped greatly in developing good quality cattle in different parts of the country. KVS was a sound approach for implementing programmes of cattle development in an integrated manner, but due to the vastness of the country (vast magnitude of Problem), the KVS was not able to make a necessary impact for immediately increasing the milk production. Each KVS was only a tiny area of well-organized activity surrounded by a vast area where indiscriminate breeding was adopted. This obliterated the good work of KVS. In 1968, 479 village blocks were functioning in various states and they covered 5 million cows and she-buffaloes which were about 6.5% of the total breedable female cattle of the country.

On review of the functioning of key village scheme, it was revealed that it did not produce results according to the expectations. Many dairy plants which were set up during the second and third five-year plan were not able to procure sufficient quantity of milk. This led to the development of yet another programme of the dairy development project, This ICDPs were to be started in breeding tracks of indigenous breeds of cattle & buffaloes and in the milk sheds of large dairy projects so that established dairy plants can procure sufficient quantity of milk for processing. (Up to their installed capacities). It was emphasized to associate each ICDP with either liquid milk plant or any milk product factory. Each ICDP was to cover 1 lack breedable cow & she-buffalo population. This target was kept to make a significant impact and increase the milk production in the area. For the success of the scheme, it is necessary that it is implemented at the best location. Thus area having good potential for milk production & where the appropriate response to cattle development can be there were chosen. In the chosen area, the target of covering 70 percent of cattle population for breeding purpose and increasing milk production by 30 percent in a period of 5 years was kept. The government of Indian extended 100 percent central assistance for the project during the 3rd five-year plan. After implementation and on completion of 2 years, these protect were transferred to plan scheme of the state government.

This change led to reduced financial assistance from central government. In some of the States due to less allocation of funds, adequate provision of inputs and services could not be made. "Major steps for the successful implementation of ICDP" are Controlled breeding, balanced feeding, Veterinary healthcare, Milk farming inputs, and Assured milk marketing. ICDP really made a good impact on increasing milk production & improving the health of dairy animals. A large number of exotic animals were imported. During 1961 to 1978, around 7500 heads of cattle of some breeds were imported viz., Jersey, Brown Swiss, Red Dane, Yorkshire, Gurneys, Holstein Frisian. Some of these exotic breeds were supplied to state governments. At the same time government of India also developed farms for multiplying the exotic breeds. At Andeshangar (Uttar Pradesh) and Hessarghatta (Karnataka) farm for Holstein Frisian were developed. At Sunabeda (Orissa), Jersey farm was established. Number of ICDP developed in each five-year plan is as under.

Table 2 Number of ICDP developed

Year	Plan	ICDP
1961-62 to 1965-66	III	19
1969-70 to 1973-74	IV	63
1973-74 to 1977-78	V	119
1980-81 to 1985-86	VI	134

Growth and Contribution of Livestock Sector Livestock population India possesses one of the largest livestock wealth in the world. And, the population of almost all the species has been growing. Agricultural sector (including crops, livestock, fisheries, forestry) contributed about 40 percent to the GDP in the 1960s. This gradually decreased to 36.5.

Table 3 Milk production and per capita availability of milk in India

Milk production and per capita availability of milk in India		
Year	Production (Million tonnes)	Per Capita Availability (grams/day)
2009-10	116.4	273
2010-11	121.8	281
2011-12	127.9	290
2012-13	132.4	299
2013-14	137.7	307
2014-15	146.3	322

2015-16	155.5	337
2016-17	165.4	355
Source: Basic Animal Husbandry Statistics, DAHD&F, GOI		

2. Per capita milk availability:

Table 2 presents the trends observed in the annual milk production and per capita availability of milk in India from 2009-10 to 2016-17. The milk production was recorded 116.4 million tonnes in the year 2009-10 which have risen to 165.4 million tonnes in the year 2016-17, whereas the per capita availability of milk was 273 grams in 2009-10 which has risen to 355grams in the year 2016-17. India is said to have crossed the milestone of the world average per capita availability of 295 grams per day per person, reaching 322 grams in 2014-15. From 2009-10 and 2014-15 it grew at 3.4% on CAGR basis, whereas the estimated growth rate in consumption for 2015 is 4.8%. This again indicates that the present growth in milk production is insufficient to meet the increased needs of growing population for more animal proteins including milk.

Table 4. Livestock population (2012 Livestock census):

Sr. No	Species	Number(in millions)	Ranking in the world population
01	Cattle	190.9	Second
02	Buffaloes	108.7	First
	Total (including Mithun and Yak)	300	First
03	Sheep	65.0	Third
04	Goats	135.2	Second
05	Pigs	10.3	-
06	Others	1.7	-
	Total livestock	512.3	
	Total poultry	729.2	Seventh
07	Duck	-	Fifth
08	Chicken	-	
09	Camel	-	Tenth

Table 5 Production of livestock in India 2015-16.

Sl. No.	Product	Quantity	Ranking in the world production
01	Milk (million tones)	155.50	FIRST
02	Eggs (billions nos.)	82.93	THIRD
03	Meat (million tones.)	7.02	NA
04	Wool (million kgs.)	47.9	NA
05	Fish (lakh tones)	107.90	SECOND

Source: Annual Report 2016-17, Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture and Farmers Welfare, Govt. of India.

3. Annual growth rate value of output from GDP:

The share of the agriculture sector and livestock sector in total GDP of India has declined from 34.72% and 4.82% in 1980-81 to 15.18% and 3.92% in 2011-12 respectively. It contributes around 8.80 and 8.39 percent of Gross Value Added (GVA) in Manufacturing and Agriculture.

Table 5 Share of Agriculture and Allied and Livestock Sector in GVA

The share of Agriculture & Allied and Livestock Sector in GVA-(At Current Prices in Rs. Crore)					
Year	GVA (Total)	GVA (Agriculture & Allied)			
		Amount	% Share	Amount	% Share
2011-12	81,06,656	15,01,816	18.5	3,27,301	4.0
2012-13	92,02,692	16,75,107	18.2	3,68,823	4.0
2013-14	103,63,153	19,26,372	18.6	4,22,733	4.1

2014-15	114,81,794	20,68,958	18.0	5,10,020	4.4
2015-16	124,58,642	21,75,547	17.5	5,60,613	4.5
Source: National Accounts Statistics-2016, Central Statistical Organization, GoI.					

The share of livestock in GVA of agriculture has been rising since 2011-12. Dairy sector in India has been a significant contributor to the Gross Domestic Product and its value of output has grown significantly. The dairy sector is one of the important contributors to the growth of Indian economy. The value of an output of livestock sector was 327301 Crores at current prices in the year 2011-12 which rose to 388370 in the year 2013-14. The share of Livestock sector in the GDP was 4.1 percent in the 2013-14 which rose to 4.4 percent in 2014-15. The share of livestock sector has increased to 4.5 percent in 2015-16 and seen the negligible increase of 0.1 percent. With Gross Domestic Product (GDP) growth estimated to be 6.5 percent in 2017-18, as per estimates released by CSO.

4. Challenges faced and Opportunities by dairy industry:

India is the world's largest producer and consumer of milk. Growth in milk supply and demand has been robust, but projections indicate that production targets will be difficult to reach without stronger gains in productivity. India is the world's largest producer of dairy products by volume, accounting for about 13% of world's total milk production and also accounts for the world's largest dairy herd. India is a country that consumes its own milk production. India is neither considered an active importer or an exporter of dairy products. Yet the country provides a share in the global market still remains at small rates of 0.3 and 0.4 percent for exports and imports respectively. This is because of people who directly consumption of liquid milk by the producer households. This also increases the demand for processed dairy products that has increased with the growth of income levels, which have left little dairy surpluses for export. Although, India with more consumers we export special products like casein for food processing or pharmaceuticals. (Mario Gabriele Miranda and Ramachandran, 2014).

Over the years, India has emerged as one of the world's biggest producers of milk, with the total milk production rising from 122 Million Metric Tons in 2010-11 to 162 Million Metric Tons in 2016-17. Despite this, the majority of the dairying in India is still highly unorganized dominated by small and marginal dairy farmers. India is the world's largest producer and consumer of dairy. The dairy industry in India was worth INR 5,000 billion in 2016. India is also globally the largest milk producing country since 1997.

In India, the co-operatives and private dairies have access to only 20% of the milk produced. Approximately, 34% of the milk is sold in the unorganized market while 46% is consumed locally. This is in comparison to most of the developed nations where almost 90% of the surplus milk is passed through the organized sector. The milk processing industry of India is small compared to the huge amount of milk produced every year. Only 10% of all the milk is delivered to some 400 dairy plants. A specific Indian phenomenon is the unorganized sector of milkmen, vendors who collect the milk from local producers and sell the milk in both, urban and non-urban areas, which handles around 65-70% of the national milk production. In the organized dairy industry, the cooperative milk processors have a 60% market share. The cooperative dairies process 90% of the collected milk as liquid milk, whereas the private dairies process and sell only 20% of the milk collected as liquid milk and 80% for other dairy products with a focus on value-added products. Majority of the milk produced by the farmers are directly sold as fresh milk and due to the lack of hygienic handling of milk and the infrastructure in rural areas, the quality standards of the milk may vary with the international market standards. Even though the milk produced and sold directly into the markets may be reasonably clean, appropriate cold chain facilities should be improved in village collection centers which lead to the informal markets (Mathur, 2000).

Letha Devi et al (2018) suggested key areas for comprehensive development of Indian dairying key areas of concern are competitiveness, cost of production productivity of animals, infrastructure, value addition, etc., some specific initiatives may be taken to meet challenges of enhancing production and farm income and concluded that without increasing productivity, efficiency is difficult the age of globalization.

4.1 Challenges by dairy units:

1. **Quality a big concern:** More than 70% of the marketable surplus goes through an informal channel where quality is a big concern. Sometimes quality is an issue in the formal channel as well. Quality of milk or value-added products is a barrier to entry to the export market, especially the USA and the EU.
2. **Poor governance of cooperatives:** Prices decided by cooperatives are not based on fat measurement, which affects Farmer's profitability. In addition, lower prices declared by cooperatives results in low prices of milk paid by all the players in the industry.

3. **Non-existent of extension facilities:** Lack of adequate breeding and preventive care services to improve animal health, along with low access to credit and risk-taking ability makes farmers unable to increase their herd size.
4. **Taxation on value-added products:** Taxation on value-added products would cause the industry to reduce the milk prices paid to the dairy farmers. The high rate might also increase the consumer prices of dairy products substantially.
5. **Due to Lack of proper veterinary extension system:** There is a poor perception of the farmers towards dairy enterprise as a viable alternative to crop husbandry.
6. **Middlemen eat all the profits:** The unorganized fragmented market for milk and milk products involved a chain of middleman who reaps the actual benefit depriving the producers of their due share.

4.1.2 The practical dairy farming challenges in India:

1. **Small dairy farms:** Dairy animals are kept by small farmers and the number can vary from 1 to 5 animals per farm. Not be suitable to call them as dairy farms.
2. **Feeding of animals:** No awareness about the balanced feeding of cattle, i.e. knowledge of how much of what should be fed to animals.
 - a. Water only given in limited amount/ times.
 - b. A supplement feeding is very minimal or absent.
3. **Health issues:** In animal health, there are following challenges like:
Frequent disease incidence like FMD which has a negative impact on dairy production.
The absence of preventive health care measures like vaccination and de-worming.
4. **Management of animals:** In management, there are challenges like:
 - a. Hygienic animal shed.
 - b. Teat washing and dip before milking.
 - c. Dis-infestation of animal shed regularly.
5. **Farm economics:** Dairy farmers are not aware of proper record keeping and dairy farm economics. This has a negative impact on the income of the farmers and his spending on a dairy farm.

In the last 5 years, only 20 % of the professional dairy farms have been successful. There are varieties of reasons for this low success rate. High investment costs especially the cow and buffalo prices have increased dramatically. There are huge labor shortages especially in south India and automation using machines have not been very effective. Due to high perishable nature of milk, the value addition such as processing, packaging, and conversion to long life products, such as sterilized milk (UHT), dahi, paneer, chhachh, lassi, shrikhand and so on, is more a necessary, while imposing GST and imperative to create a special class for dairy products with minimum value-addition. Tax exemption on dairy industry should not be considered as a loss to the nation, which eventually would enhance rural prosperity and increase the farmer's income.

Indian government should have a farmer-centric approach, milk is the only industry that is able to pay to the dairy farmers more than 2/3 of the price charged to the consumer. No other food processing industry in India is able to meet such high expectations of the farmers.

In addition, there should be the level playing field for private players and the cooperatives. There is very low competition to cooperatives because the private sector was not allowed to participate until recently. Lastly, grants to be provided to strengthen extension services in areas of animal husbandry. Offer subsidies to encourage rural entrepreneurship in areas of milk procurement such as collection center setup and credit correspondents.

IV. CONCLUSION:

Dairy development in India has proven a low milk production of 17 million tonnes in 1951 to 165.4 million tonnes in 2017. Today Indian dairy industry contributes significantly to GDP and Agricultural GDP. The share of livestock in GVA of agriculture has been rising since 2011-12. With Gross Domestic Product (GDP) growth estimated to be 6.5 percent in 2017- 18, as per estimates released by CSO. India can be rated as among the best performing economies in the world on this parameter. India has become the largest producer of milk in the world and is the largest consumer of milk. This huge success in dairy development through Operation Flood largest rural development programme in the world, Intensive cattle development programme, and key village scheme. In spite of that Indian dairy industry also evident by various challenges which are repeatedly hampering its additional development. The organized sector has limited coverage of dairy industry it needs to footstep up to increase its coverage and the benefits of dairy development should be reached to the village level milk producer farmer which are the main contributors to the dairy development of India. Although India is self-sufficient in dairy product but its dairy industry is facing challenges we have to overcome it through systematic approach and planning.

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