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# Dairy Co-operatives and Milk Marketing in India: Constraints and Opportunities

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Operation Flood and dairy co-operatives emerged in India as the largest rural employment scheme, enabling the modernization of the dairy sector to a level from where it can take off to meet not only the country's demand for milk and milk products but can also exploit global market opportunities. This study reviews the existing status of milk marketing and dairy co-operatives in India and provides recommendations to meet future challenges. The results of the study indicate that 80 percent of the milk produced by the rural producer is handled by an unorganized sector and the remaining 20 percent is handled by an organized sector. It is found that the dairy co-operatives play a vital role in alleviating rural poverty by augmenting rural milk production and marketing. Involvement of intermediaries; lack of bargaining power by the producers; and lack of infrastructure facilities for collection, storage, transportation, and processing are the major constraints which affect the prices received by producers in milk marketing. Milk quality, product development, infrastructure support development, and global marketing are found to be future challenges of India's milk marketing.

Dairying is a centuries-old tradition for millions of Indian rural households; domesticated animals have been an integral part of the farming systems from time immemorial. Milk contributes more to the national economy than any other farm commodity—more than 10.5 billion dollars in 1994-95 (*Dairy India* 1997). In the context of poverty and malnutrition, milk has a special role to play for its many nutritional advantages as well as providing supplementary income to some 70 million farmers in over 500,000 remote villages (*Dairy India* 1997). More importantly, the farmers earn an average 27.3 percent of their income from dairying, with as high as 53 percent for landless and as low as 19 percent for the large farmers (Table 1).

Annual milk production in India has more than tripled in the last three decades, rising from 21 million tons in 1968 to an anticipated 80 million metric tons in 2001. This rapid growth and modernization is largely credited to the contribution of dairy co-operatives under the Operation Flood (OF) Project, assisted by many multi-lateral agencies including the European Union, the World Bank, Food and Agriculture Organization (FAO), and World Food Program (WFP). Despite the impressive growth in milk production in the last three decades, productivity of dairy animals remains very low (Table 2) and milk-marketing systems primitive. Currently, more than 80 percent of the milk produced in the

country is marketed by unorganized sectors and less than 20 percent by the organized sector. The organized sector involves government and co-operatives; the unorganized sector involves private organizations.

Marketing of the majority of the milk through unorganized sectors is likely to dissuade small dairy farmers from expanding production, which is absolutely necessary to keep up with the strong demand growth. In a recent study, Datta and Ganguly (2002) estimated Indian milk demand for 2020 under various GDP growth rates. The study reported that if the current growth continues for the next twenty years (the nation has been growing at a rate between 5 and 7 percent over past five years), milk consumption is likely to more than double by 2020.

This paper examines the existing status of milk marketing in India and analyzes the constraints and opportunities in milk marketing. The first section reviews background information on milk production and discusses the existing milk-marketing system in India. Following this, Operation Flood and its effects on milk marketing—particularly through dairy co-operatives—are discussed. Finally, constraints and the opportunities in the existing milk-marketing system are discussed and proposed policy implications are highlighted.

## Milk-Marketing System

India has the largest cattle and buffalo population in the world. More than 67 percent of dairy animals are owned by marginal and small farmers, which

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**Table 1. Share of Household Income (%) by Source.**

Household	Dairying	Crop husbandry	Others	Total
Landless	53.08	0.00	46.92	100
Marginal	30.14	46.55	23.30	100
Small	29.67	53.75	16.58	100
Semi-medium	26.25	58.98	14.76	100
Medium	25.33	62.77	11.91	100
Large	19.02	71.48	9.50	100
All	27.28	55.36	17.36	100

Source: Shukla and Brahmankar (1999).

**Table 2. Productivity of Milk Animals by Zone, 1995–96.**

Zone	Crossbred cows		Indigenous cows		Buffalo	
	Kgs/day	Lactation (days)	Kgs/day	Lactation (days)	Kgs/day	Lactation (days)
East	5.82	300	3.01	150	5.39	200
North	7.07	300	3.29	200	5.25	250
West	7.80	300	3.19	200	4.51	250
South	6.39	300	3.35	150	3.96	200

Source: Shukla and Brahmankar (1999).

**Table 3. Distribution of Milk Animals in Rural Households (HH) by Land-Holding Category, 1992.**

Category	Number of HH ( $\times 10^2$ )	Total number of milk animals <sup>a</sup> (per 100 HH)	Number of crossbred milk animals (per 100 HH)
Landless <sup>b</sup>	254,249	11	1
Marginal	561,777	68	8
Small	165,486	114	8
Semi-medium	112,911	136	9
Medium	57,369	168	10
Large	12,382	239	7

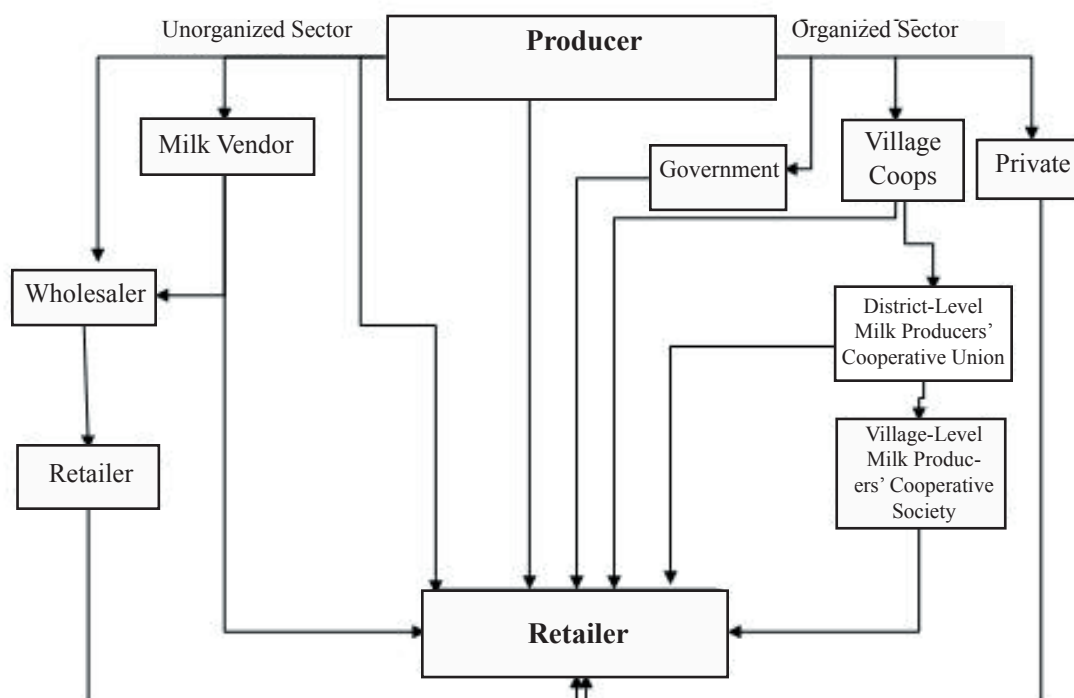
<sup>a</sup> Milk animals comprise dry, in-milk, and others (Livestock Census Classification: adult breedable females), including crossbreds.<sup>b</sup> Landless category includes HH with  $\leq 0.002$  ha of land, as well as those without any land.

Source: NSSO (1992).

constitute the core milk-production sector in the country (Table 3). Many of these farmers own dairy animals primarily to supply milk for their own consumption. Slightly more than 30 percent of the milk produced in the country is retained in producer households.

A schematic diagram of milk marketing channels in India is presented in Figure 1. Eighty percent of

milk is marketed through the highly fragmented unorganized sector, which includes local milk vendors, wholesalers, retailers, and producers themselves. On the other hand, the organized dairy industry, which accounts for about 20 percent of total milk production, comprises two sectors: government and co-operatives. Even though co-operatives provide a remunerative price to the producer, the unorganized



**Figure 1. Milk-Marketing Channels in India.**

sector plays a major role in milk marketing because of three factors. The first factor is the pricing policy of the co-operatives: their purchase price is based on the fat content of the milk, whereas the private sector pays a flat rate per liter of milk. The second factor, which motivates the milk producers to sell milk to private vendors, involves the type of milk animals reared by the producer. Crossbred cows yield more milk with a lower fat than do buffalo. The crossbred cow population has increased over years because of artificial insemination and improvements in management practices. The third factor is payment policy. The private sector can pay their producers everyday, whereas the co-operatives pay weekly or fortnightly. Producers sometimes have to fight with the co-operatives to get their payments.

Within the organized sector, the co-operative sector is by far the largest in terms of volumes of milk handled, installed processing capacities, and marketing infrastructure. The eighty-two thousand Dairy Co-operative Societies (DCSs) across the countries have a strong membership of nearly 10 million landless, marginal, and smallholder milk-producer families.

Although the organized sector handles less than 20 percent of the production, it has an installed capacity to process about 33 percent of India's total milk production. As shown in Table 4, the co-operative and private sectors have more or less equal capacities. Much of the processing capacity created by the private sector in the wake of the liberalization of the Indian economy in 1991 remains idle; only about 60 percent of the installed capacity of the private sector is operated on a day-to-day basis. In the government sector, too, most of the primary processing facilities installed in rural areas (mainly milk-chilling centers) are not functional and dairy plants in the smaller towns and cities are grossly under-utilized. In the co-operative sector, all plants are used to their full capacity and remain under-utilized only during the lean production season.

### **The Roles of Co-operatives in Milk Marketing**

Operation Flood, launched in 1970, introduced co-operatives into the dairy sector with the objectives of increasing milk production, augmenting rural income, and providing fair prices for consumers. It

**Table 4. Current Milk-Processing Capacity.**

Sector	Number of plants	Capacity (10 <sup>6</sup> liters/day)
Cooperative	218	32.47
Private	366	30.26
Government	39	3.87
Total	623	66.60

Source: Datta and Ganguly (2002).

was started to effectively utilize donated milk products from abroad for domestic dairy development. These surpluses were used to speed up Indian dairy development in two ways. First, the donated milk products were used to reconstitute milk and therefore provide the major cities' liquid-milk schemes with enough milk to obtain a commanding share of their markets. Secondly, the funds realized from the reconstitution and sale of donated products were used to resettle city-kept milk animals and permit their progeny to multiply; to increase organized milk production, procurement, and processing; and to stabilize the major liquid-milk schemes' position in their markets. The objectives of Operation Flood can be summarized as follows:

1. To enable each city's liquid-milk scheme to restructure and capture a commanding share of its market;
2. To identify and satisfy the needs of milk consumers and producers, so that consumers' preferences can be fulfilled economically and producers can obtain a larger share of the price paid by consumers for their milk;
3. To facilitate long-term productive investment in dairying and cattle development; and
4. To ensure a sufficient supply of personnel to handle each facet of the project.

The three phases of Operation Flood succeeded in fulfilling a major part of their objectives. During its first phase, Operation Flood linked 18 of India's premier milk sheds with consumers in India's four major metropolitan cities: Delhi, Mumbai, Calcutta, and Chennai.

Operation Flood's Phase II (1981–1985) increased the milk sheds (collection centers) from 18 to 136; 290 urban markets expanded the outlets for milk. By the end of 1985 there was a self-sustaining system of 43,000 village co-operatives

covering 4.25 million milk producers. Domestic milk-powder production increased from 22,000 tons in the pre-project year to 140,000 tons by 1985, all of the increase coming from dairies set up under Operation Flood. Producers' co-operatives increased direct marketing of milk by several million liters a day.

Phase III (1985–1996) enabled dairy co-operatives to expand and strengthen the infrastructure required to procure and market increasing volumes of milk. Veterinary health-care services, feed, and artificial-insemination services for cooperative members were extended, and member education intensified. Phase III consolidated India's dairy cooperative movement, adding 30,000 new dairy co-operatives to the 42,000 existing societies organized during Phase II. Milk sheds peaked to 173 in 1988–89 with the numbers of women members and Women's Dairy Cooperative Societies increasing significantly.

Today there are 22 state federations in India, with 170 district-level unions, more than 76,000 village-level cooperative societies, and 11 million milk-producer members in the different states. These co-operatives collect an average of 15 million liters of milk each day. Fresh liquid milk, packed and branded, is marketed in over 1000 cities and towns in India by these co-operatives; annual sales turnover exceeds 80 billion Indian rupees (Rs) (US\$1 = Rs45.5).

Most of the dairy co-operatives in India are based on the principle of maximization of farmer profit and productivity through cooperative effort. This pattern, known as the Anand Pattern, is an integrated cooperative structure that procures, processes, and markets produce. Supported by professional management, producers decide their own business policies, adopt modern production and marketing techniques, and receive services that individually

they can neither afford nor manage. The Anand Pattern succeeds because it involves people in their own development through co-operatives where professionals are accountable to leaders elected by producers. The institutional infrastructure—village co-operatives, dairy and cattle feed plants, and state and national marketing—is owned and controlled by farmers.

The Anand model co-operatives have progressively eliminated middlemen, bringing the producers in direct contact with consumers. In spite of opposition to these projects by middlemen and other powerful vested interests, Dr. Kurien, the former chairman of the National Dairy Development Board, has been able to make major breakthroughs in the dairy and oilseeds sectors supported by the highest level in the Government of India.

### Structure and Services of the Anand Pattern

The basic unit in the Anand Pattern is the village milk-producers' co-operative, a voluntary association of milk producers in a village who wish to market their milk collectively. Every milk producer can become a member of the co-operative society by buying a share and committing to sell milk only to the society. Each producer's milk is tested for fat percentage (many also measure solids-not-fat) and is paid on the basis of the quality of the milk. In

addition to milk collection, other services such as cattle feed, artificial insemination (AI), and veterinary services are also provided by the societies.

Village milk producers' co-operatives in a district are members of their district co-operative milk-producers' union. The Union buys all the societies' milk, then processes and markets fluid milk and products. Most Unions also provide a range of inputs and services to the village societies—feed, veterinary services, artificial insemination, and other services—and have milk-processing plants to convert seasonal surpluses of liquid milk into milk powder and other conserved products. This allows the Union to ensure better returns to its members.

Today in Gujarat, under the Anand Pattern system, there are 11,000 village-level co-operatives with a total membership of 2.1 million milk producers affiliated with 12 district-level unions. These unions federate into a state-level apex marketing organization known as the Gujarat Co-operative Milk Marketing Federation (GCMMF). The GCMMF was established in 1973 with the objective of providing the milk producers of Gujarat with their own marketing and distribution network in order to give them access to the most important link in the system: the customer. The farmers had realized that marketing was the key to the success of the Anand Pattern and to their success when they had control over the marketing system. The results are

**Table 5. Performance of Dairy Co-operatives Organized through Operation Flood as of March 31, 1995.**

Regions	Anand-Pattern DCS	Producer members (000)	Processing capacity (000 lbs)	Average procurement (000kgs/day)	Average annual marketing (000 lbs)	Artificial insemination centers (DCS)	Mobile veterinary clinics
Northern region	22,166	1,343	4,630	1,451	1,957	3,365	151
Western region	20,854	3,140	9,375	4,984	3,262	5,584	328
Southern region	20,886	4,241	5,504	3,546	3,341	5,711	242
Eastern region	5,065	268	1,536	304	833	1,520	31
Total	69,868	8,992	21,045	10,285	9,393	16,180	752

Source: *Dairy India* (1997).



evident. Today, GCMMF is India's largest food-products marketing organization with an annual sales turnover exceeding Rs 22 billion (about US\$ 483.5 million). The Amul brand is among the most popular brands in the country.

The performance of dairy co-operatives organized under Operation Flood is given in Table 5. In the western and southern regions the DCSs are performing better in terms of milk procurement and marketing due to improved infrastructure facilities for milk production compared to northern and eastern regions DCSs.

### Constraints in Milk Marketing

The dairy sector is characterized by small-scale, scattered, and unorganized milk-animal holders; low productivity; inadequate and inappropriate animal feeding and health care; lack of an assured year-round remunerative producer price for milk; an inadequate basic infrastructure for provision of production inputs and services; an inadequate basic infrastructure for procurement, transportation, processing and marketing of milk; and lack of professional management. Other important characteristics of the dairy sector are the predominance of mixed crop-livestock farms and the fact that most of the milk animals are fed on crop by-products and residues, which have very low opportunity costs. Additionally, the dairy-development policies and programs that are followed, including those relating to foreign trade, are not congenial to the promotion of sustainable and equitable dairy development.

Low productivity of milk animals is a serious constraint to dairy development. The productivity of dairy animals could be increased by crossbreeding low-yielding nondescript cows with high-yielding selected indigenous purebreds or suitable exotic breeds in a phased manner. The cattle-breeding policy should not only focus on milk yield but should also provide for the production of good-quality bullocks to meet the draft-power requirements of agriculture. Upgrading nondescript buffalo through selective breeding with high-yielding purebreds such as Murrah, Mehsani or Nili Ravi should be given high priority in all areas where buffalo are well-adapted to the agro-climatic conditions.

While fixing procurement prices, producers' interests should receive the utmost attention. The producer price should at least cover the long-run average cost of milk production and provide a rea-

sonable mark-up. Studies on cost of milk production and its financial viability should be initiated by Departments of Animal Husbandry or the Dairy Development Boards/Corporations. Such research needs to be carried out in all the major agro-climatic zones and should be repeated at regular intervals of approximately three years to determine whether milk production is profitable and to furnish an objective basis for fixing the producer price of milk. The studies may be entrusted to reputed universities/research organizations operating in the regions selected for the studies.

Despite all the problems it faces, the dairy sector holds high promise as a dependable source of livelihood for the vast majority of the rural poor. Liberalization of world trade in dairy products under the new trade regime of the WTO poses new challenges and has opened up new export opportunities for the dairy industry. The dairy sector in India needs to enhance its competitive economic advantage in dairy products in terms of both quality and cost and its credibility in international markets. The role of government should be to direct, coordinate, and regulate the activities of various organizations engaged in dairy development; to establish and maintain a level playing field for all stakeholders; and to create and maintain a congenial socio-economic, institutional, and political environment for smallholder dairy development. A comprehensive dairy development policy must be formulated. Such policy should be an integral part of national development policy and due consideration should be given to its direct and indirect effects on other sub-sectors of the economy and vice-versa.

The future of dairying will also rely on the continued adaptation of management techniques to suit markets, environments, and socio-economic conditions. Managing dairy plants and cattle-feed factories is not the business of government; it is better left to professional managers who are employees of the milk co-operatives and hence are accountable to their member milk producers.

In spite of these developments, milk marketing in India remains grossly primitive compared to its western counterparts. It begins with the largely unregulated sector, which handles the majority of the milk production, providing ample opportunity for malpractice. Some of the common forms of malpractice include false measurements in the selling of milk and adulteration of milk. Another major impediment to an efficient marketing system

is the presence of numerous intermediaries, which take advantage of producers' weakness. In many cases, intermediaries dictate the price by advancing a loan to the milk producers. Producers' bargaining power is also limited because of perishability and bulkiness of milk. In addition, the lack of proper infrastructure for transportation, distribution, and storage also makes milk procurement difficult.

On the other hand, it will be impossible for most producers to market their milk without the presence of these market intermediaries. The Cooperative Societies Act continues to be restrictive rather than enabling, even though the Anand Pattern milk producers' co-operatives have emerged as the most stunningly effective institutional model for milk marketing. Political and bureaucratic interference, delayed payments to the primary producers, and the decision-making power of the administrators over marketing of milk and milk products by the district-level union and the state-level federation also adversely affect the growth of dairy co-operatives. The cooperative laws in general have inhibited the emergence of true leadership, professional management, and democratic functioning of the co-operatives.

### **Future Challenges**

"Failure is never final, and success never ending." Former Chairman Kurien bears out this statement perfectly to describe the current status of the dairy industry in India. The Indian dairy industry needs to focus simultaneously on the four-fold challenge of quality, product development, infrastructure-support development, and global marketing. Equally urgent is the need for strategic alliances with some of the leading dairy companies in the world for technical collaboration and marketing tie-ups. Raw-milk handling needs to be upgraded in terms of physico-chemical and microbiological attributes of the milk collected. Better operational efficiencies are needed to improve yield, reduce waste, minimize fat and protein losses during processing, control production costs, save energy, and extend shelf life. The adoption of Good Manufacturing Practices (GMP) would help manufacture milk products that conform to international standards and thus make exports competitive.

Restructuring Departments of Animal Husbandry in states, reorienting their mandate from curative to preventive veterinary care, moving de-

livery of livestock services away from government, progressive privatization of the services, a nationwide program for prevention and control of animal epidemics, and creation of disease-free zones will all reduce avoidable production losses, investment risks, and the yield gap; improve output; and will facilitate India's entry into global product markets, improving the quality and viability of the entire Indian dairy industry. Restructuring the governments' legal and regulatory framework, thus liberating the cooperative movement, will enable milk producers to extensively adopt the proven Anand Pattern producers' cooperative model to manage their assets and business interests. This will help them vertically integrate production, processing, value additions, and marketing of milk and milk products in domestic as well as global markets, converting India's comparative advantages in dairy production into globally competitive advantages.

### **Conclusion**

Planned development of the dairy sector started with the launch of the first five-year plan in 1951. Policies and programs under the first three five-year plans (1951–66) were inadequate to influence milk production and milk output continued to be stagnant (3 million tonnes, from 17 to 20 million tonnes). By the end of the third five-year plan the inadequacies were apparent and the government made a serious policy reorientation to engineer sustained increases in milk production. The plan "holiday" between the third and fourth plans (1966–69) saw some of the most momentous policy initiatives by the government in the livestock sector, particularly for dairy development. Development of rural milk sheds through milk producers' co-operatives and movement of processed milk to urban demand centers became the cornerstone of government policy. This single policy-making epoch in the late 1960s galvanized the Indian dairy industry, moving it into a growth path unprecedented in recent history in any country. This policy found institutionalization in the National Dairy Development Board (NDDB) and was translated into action by the Operation Flood Project and the nation-wide milk co-operative network promoted under the Project for marketing the rurally produced milk.

The existing status of milk marketing indicates that milk is predominantly marketed through the highly fragmented unorganized sector. The orga-



nized dairy industry, which accounts for less than 20 percent of total milk production, comprises government and co-operatives. Within the organized sector, the co-operative sector is by far the largest in terms of volumes of milk handled.

The dairy co-operatives in India are a three-tier structure following the Anand Pattern, including village-level milk-producers' co-operative societies, district-level milk-producers' co-operative unions, and state-level milk-producers' co-operative federations. Dairy co-operatives provide inputs, animal health-care, and extension services to the society members and also train employees of village- and district-level dairy co-operatives.

The major constraint in milk marketing is the involvement of the unorganized sector. Changing the dairy-cooperative laws and regulations can reduce the unorganized sector's role in milk marketing. Strengthening the infrastructure for milk collection, transportation, processing, packaging, pricing, and marketing through dairy co-operatives can also change the minds of the milk producers. Producers are not receiving a remunerative price for their produce because of the presence of middlemen in milk marketing. By reducing the number of middlemen between producer and consumer, the consumers' share to the producer can be increased. In other words, bridging the gap between the pro-

ducer and the consumer can increase the producer's share. Producers' bargaining power and the lack of proper infrastructure for transportation, distribution, and storage are other constraints which make milk procurement difficult. Furthermore, future challenges in milk marketing are mainly concerned with quality, product development, infrastructure-support development, and global marketing. We can overcome these challenges by strengthening the dairy co-operatives.

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