

# Lessons Learned Studies: INDIA



*By*

**Animesh Banerjee**

Address: 52/116, First Floor, C.R. Park,  
New Delhi-110019 INDIA  
Phone: 91-11-26271985, 40560950  
Mobile: 9810424075  
E-mail: [banerjeeanimesh@rediffmail.com](mailto:banerjeeanimesh@rediffmail.com)



## Table of Contents

<b>Key Definitions .....</b>	<b>3</b>
<b>Background .....</b>	<b>4</b>
<b>Institutional Structure for Milk Production/Processing and Marketing .....</b>	<b>5</b>
Co-Operative Milk Producers' Organisation On Anand Pattern .....	6
Milk Production In India (Million Tonnes) .....	7
Milk Supply Chain Traditional Unorganised Dairying System .....	9
<i>Tradition Or Non-Institution (Unorganised) .....</i>	<i>9</i>
Milk Supply Chain Model – Organised Dairying System .....	10
<i>Institutional (Organised) Milk Marketing System .....</i>	<i>10</i>
<b>Milk Policies.....</b>	<b>11</b>
<b>Milk Pricing.....</b>	<b>12</b>
<b>Smallholder Dairy Farmers.....</b>	<b>12</b>
<b>Conclusion.....</b>	<b>15</b>
Smallholder Dairy Farmer SWOT.....	15
<b>Dairy Strategies Prospects.....</b>	<b>19</b>
<b>Annexure 1.....</b>	<b>20</b>
Milk Flow Chart.....	20
<b>Annexure 2.....</b>	<b>21</b>
Milk Price Chart.....	21
<b>Annexure 3.....</b>	<b>22</b>
Lessons Learned Studies — India by Animesh Banerjee .....	22
<b>Annexure 4.....</b>	<b>25</b>
List of Selective Publications about the Dairy Development in India.....	25



## Key Definitions

**Milch Animals:** Dairy Animals like Cattle and Buffalo

**Small Farmers:** Cultivators with a land holding of 2 hectares (5 acres) or less, as defined in the land ceiling legislation of the concerned State/ UT.

**Marginal Farmers:** Cultivators with a land holding of 1 hectare or less (2.5 acres)

**Landless Laborers:** Farm and non-farm laborers and do not have any land holding.

**Anand Model (Anand Pattern):** A vertically integrated cooperative structure involving farmers in managing its affairs.. The concept since developed, in a western Indian city called Anand and with its success, the system became popular known as 'Anand Pattern' of cooperative dairy development. With its continued popularity and replication initially at the state level, followed by at the national level, it became globally known as 'Anand Model' of cooperative dairy development.

**Operation Flood Programme (OFP):** A single commodity (milk) programme, using food aid as a tool for socio-economic development. The WFP/EEC provided food aid, the World Bank extended financial assistance. Besides, FAO/World Bank provided funding/technical/managerial expertise for the successful implementation of the OFP.

**Milk and Milk Products Order (MMPO):** This order was introduced in 1992, by the Government of India. If any entrepreneur is to establish/operate a dairy business, in India, it has to register under the MMPO.

**Cooperative Company:** A producers cooperative institution, registered under the companies act which functions similar to any private corporate, with an exception that the voting right of the share holders in the cooperative company does not commensurate with their share holding as in the private corporate.



## Background

Dairying in India is as old as the Indian civilization itself. Milch animals like cattle and buffalo are a symbol of purity and motherhood in the Hindu religion and domesticated as an integral part of the Indian social system. Though the practice of milch animal rearing and milking continued over the centuries, no organised efforts were made to exploit its commercial potentials and it continue to remain as a domestic support system to the society.

If the genesis of organised dairying in India is traced, it was rooted only in the early part of 20th Century, during the pre-independent era, with the establishment of military farms, by the British government. They established these farms to ensure supply of milk for their army. Consequent to the establishment of organized dairying, in India, milk procurement from rural areas and its processing and marketing in urban areas continued to be a major problem for the growth of the sector. There was no integration between milk production, processing and marketing.

Being a tropical country, India has varied seasons ranging from extreme cold to very hot. Although, Indian breeds have evolved to withstand the variation of temperatures, decline in milk production during the summer months is a usual feature, affecting the availability of milk. The seasonal variations and regional imbalances in milk production have been the added impediments. One of the greatest weaknesses of the dairy industry has been the quality of milk. The basic reasons are attributable primarily to the lack of hygiene, inadequate sanitation at the production level, since major milk producers are small, marginal and poor, living at the subsistence level.

Prior to establishment of dairy processing facilities in the major cities and creation of a national milk grid, major city milk supply used to be done by the milk dwellers. With the growth of population in the urban areas, consumers had to depend on milk vendors who kept cattle in the urban areas and sold their milk – often door to door. To exploit the urban demand, private milk contractors took away the best milch cattle from the villages and established cattle stables in the cities. They were not only fouling the environment, but also starving the calves to death and slaughtering the milch animals when they went dry, thereby causing an immense genetic setback. As a result several cattle sheds came into existence in different cities, which is popularly known as Khatala, in the country.

This situation has led to an unsatisfactory low-level equilibrium due to which 40-50 per cent of milk being produced, in India, is still, either retained at the producers' level, who are primarily small holders, for their own consumption or surpluses are being channelised through informal supply chains, dominated by middlemen or milk dwellers cum vendors, etc.!



## Institutional Structure for Milk Production/Processing and Marketing

The government tried out different strategies to develop organized dairying during the Fifties & Sixties. These schemes were established initially in the metros followed by major cities, in India. Due to lack of vertical integration in the milk supply system, most of those milk schemes used to depend on imported commodities for its sustenance. The country thus became import-dependent to sustain the city milk supplies, as far as the organised dairying was concerned. Commodities such as milk powder, butter fat/oil etc, were imported into India to meet the occasional gaps that occurred between the urban milk demands and supplies. Such dependence on imports was prevalent with the government milk plants, until the white revolution took place in India, consequent to the implementation of the Operation Flood Programme, in 1970.

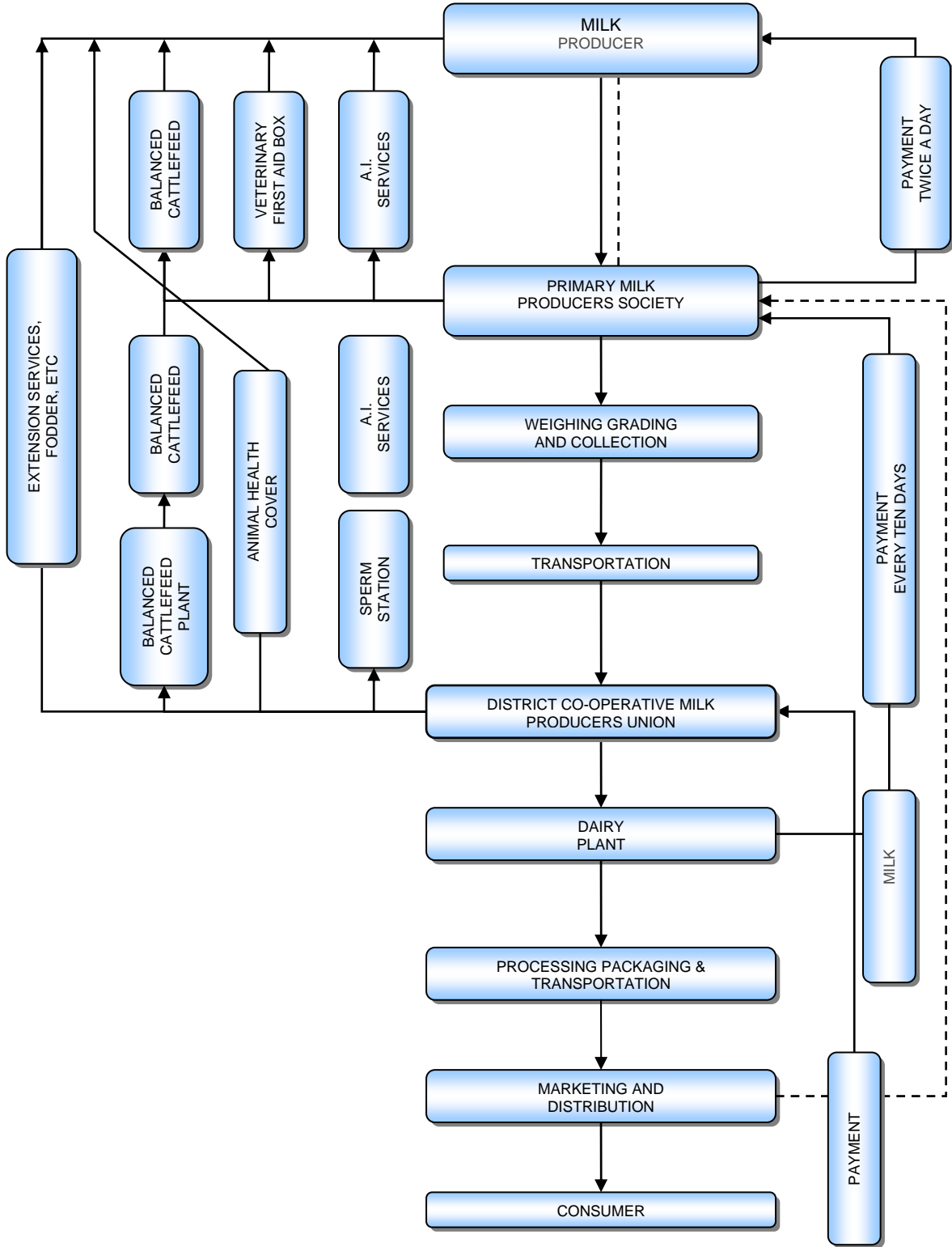
Though the government's efforts to expand organised dairying, in India, did not meet with requisite success, a vertically integrated cooperative structure involving farmers in managing its affair's, became popular, in western part of India. This movement, though commenced, in 1946, received due acknowledgement, only subsequent to continuous failures of government dairy programmes.

With its popularity, the cooperative movement, which originated in a town called 'Anand' in the state of Gujarat, became known as 'Anand Pattern' of dairy development. Later on with its replication, under the Operation Flood Programme, it became known as the 'Anand Model' of Cooperative Dairy Development!



A typical structure of 'Anand Pattern' (Anand Model) is presented, as below:

### Co-Operative Milk Producers' Organisation On Anand Pattern





In the 'Anand Pattern', each village cooperative elects their Executive Committee members and they get federated at the district level by electing their representative as a member of the district level cooperative. With the growth of 'Anand Pattern' district level cooperatives; it was federated into a state level cooperative federation.

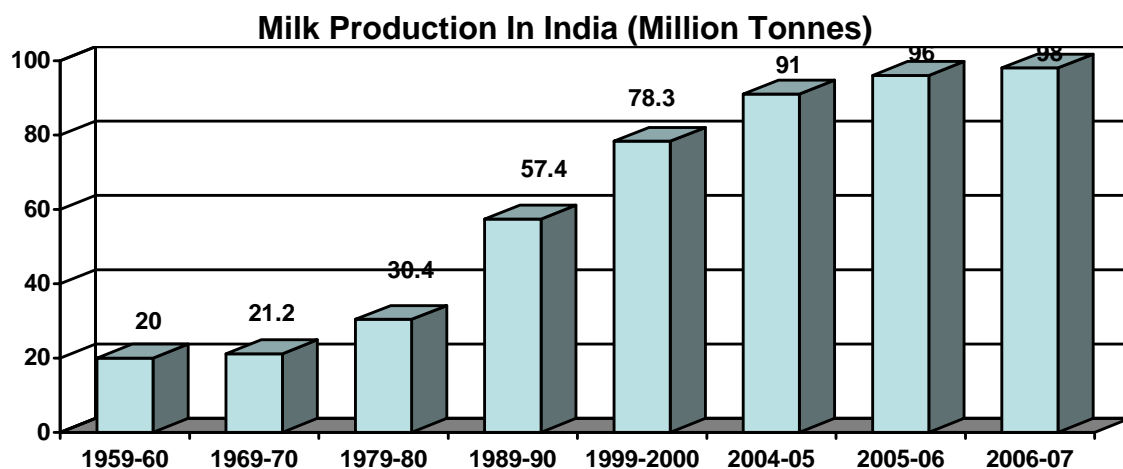
Since the 'Anand Pattern', successfully demonstrated how the small holders can be brought into the organised dairying, a programme was evolved to replicate the system, in the different milk potential states, in India, which is known as 'Operation Flood Programme' (OFP). This was a single commodity (milk) programme, using food aid as a tool for socio-economic development. The National Dairy Development Board (NDDB) of India launched this programme in 1970. In this programme, surplus commodities from developed countries were given as aid, which generated additional funds over and above the planned funds of the Govt. of India. The initial donor was the World Food Programme (WFP) and subsequently EEC and World Bank joined the programme. While the EEC provided food aid, the World Bank extended financial assistance. The FAO/World Bank provided technical/managerial expertise. With the success of the OFP, the 'Anand Pattern' became popularly called as the 'Anand Model' of the dairy development.

The OFP during its three phases of implementation between 1970 and 1992 established cooperative institution based on the 'Anand Model', in 183 milk sheds, spread over the different states of India. Processing & marketing infrastructures were created in metro and major cities as well as rural dairies & chilling centers. The programme also covered up-gradation of milch animals, veterinary and health care, provision of balanced nutritional feed, etc. to enhance milk production, etc. in the project area.

The success of OFP has demonstrated how food aid can be used to act as a catalyst to enhance domestic production, if administered with care. This programme ushered in the 'White Revolution', in India. The OFP taught, how the stakeholders, who are primarily small, marginal and landless could become self-reliant.

Consequent to the successful implementation of the OFP the cooperative dairying commanded the milk scenario, in India.

**Its visible impact on the milk production is presented below:**





44% of the milk produced in India, is retained in the villages by rural house holds; 19% sold as loose milk in urban areas. The remaining 37 % is handled by the organised sector, out of which 70 % is handled by the cooperative institutions. Subsequent to OFP implementation, the import dependence for the urban milk supply almost came to a halt! And on the contrary, India during Nineties, commenced occasional exports of its surplus commodities, primarily in bulk form around 5 to 10 thousand MT per annum, which touched around 50 thousand MT, during the year 2006-7!

The Government of India, as per its commitment to the World Trade Organisation (WTO), had introduced liberalisation policy, in June 1991, when the Indian dairy industry too was opened for private/foreign investments. However, milk being an essential item, was declared “sensitive”. Therefore, while on one hand certain restrictions were removed to enable Private Corporate both Indian and multinational, to invest in the Indian the dairy sector, certain regulatory mechanism was also introduced by the promulgation of a central government order, called Milk & Milk Product Order (MMPO), 1992. One of the conditions of the order was to restrict the new entrepreneurs to enter into the milk sheds which were already reserved for the existing dairy organizations, especially dairy cooperatives, thereby providing a certain level of protection to the cooperative institutions. Thus, the order had initially hindered the growth of Private Corporate, in India. But, in the recent past, the order has been modified by removing the restriction, referred above, which has resulted into sudden expansion of the private sector also!

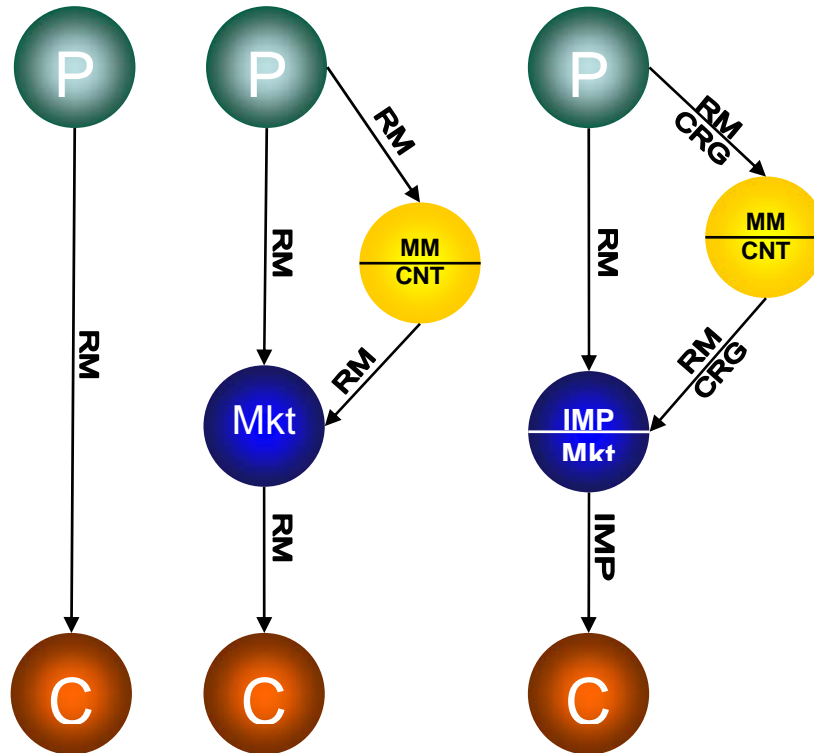
Consequent to the opening up of the Indian Dairy Sector, the number of processing facilities has taken a quantum jump. At present, there are 678 dairy processing units registered, in India which process around 12-15 per cent the milk produced in India totaling to 26.63 MT/year. Out of the total number of dairy processing units registered under MMPO, 403 are private dairies, processing around 11.83 MT/year, whereas cooperative dairies numbering 212 process 10.36 MT/year. The remaining 63 government plants have the balance-processing capacity of 4.44 MT/year. These dairy plants are registered in the different states of India.

Thus, four types of supply chains have evolved in India; out of which three are institutional, consisting of government, cooperative and private/multinational, termed as the organised dairy sector. The fourth type is known as the ‘traditional or unorganized (informal)’ sector. The organised dairy sector collects around 12-15 percent of milk produced in the country. The remaining 38-44 percent of the milk production is being handled by the traditional or unorganised sector. The milk production in India is spread around 600 districts and 6.27 lakh villages. It varies from region to region and state to state. Consequently, dairying potential, as stated above is in variance from district to district. Around 350 districts are identified as high or medium potential dairying districts, whereas remaining 250 districts are having low or very low potential.



## Milk Supply Chain Traditional Unorganised Dairying System

### Tradition or Non-Institution (Unorganised)



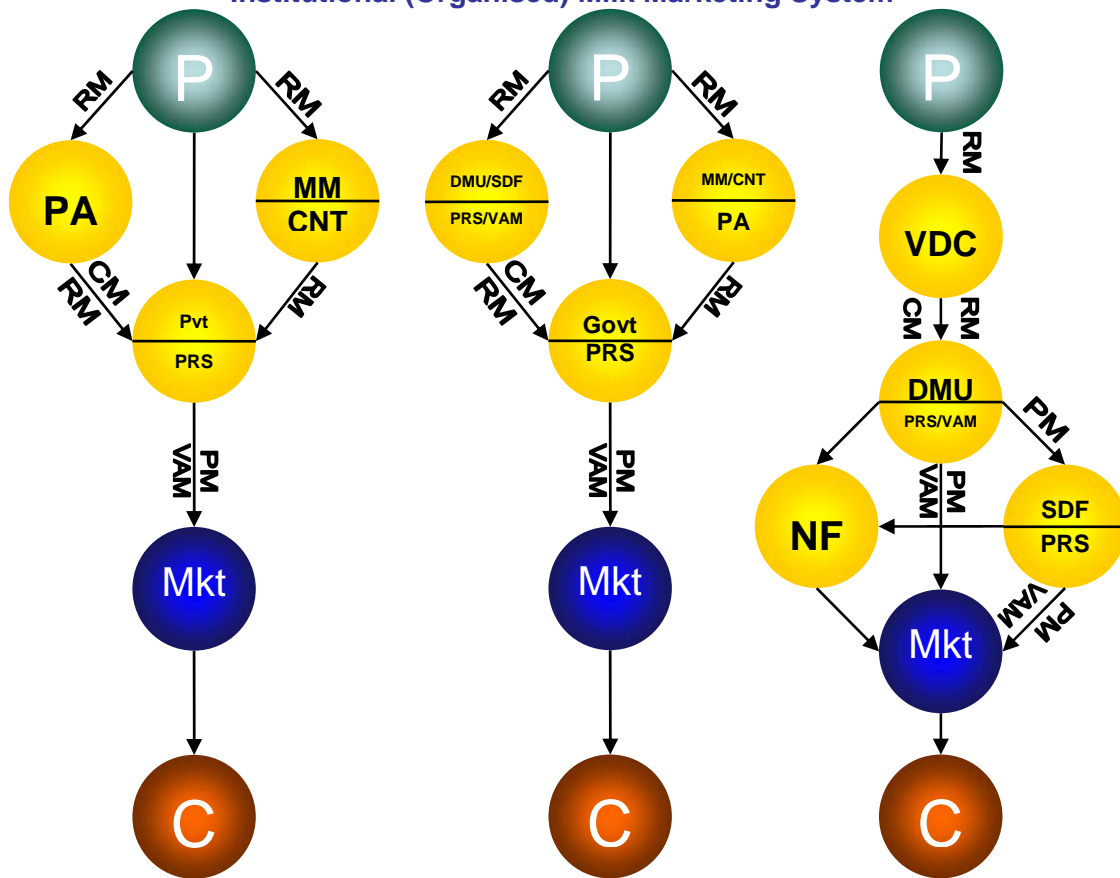
**P:** Producers  
**RM:** Raw Milk  
**CRG:** Cream / Coagulates  
**IMP:** Indigenous Milk Products  
**MM:** Milk Man  
**CNT:** Contractor  
**Mkt:** Market  
**C:** Consumers

- I. Milk producers supply milk to the consumers directly through the traditional marketing channel or through milkman/contractors.
- II. Milk producers supply milk to the consumers through intermediaries like milkman and/or milk contractors via the traditional marketing channel or directly through indigenous milk product manufacturers.



## Milk Supply Chain Model – Organised Dairying System

### Institutional (Organised) Milk Marketing System



**P:** Producers  
**RM:** Raw Milk  
**CM:** Chilled Milk  
**PRS:** Processing  
**PM:** Processed Milk  
**VAM:** Value Added Milk  
**PA:** Producers Association  
**VDC:** Village Dairy Coop.

**DMU:** Distt. Milk Union  
**SDF:** State Dairy Feden.  
**NF:** National Federation  
**Pvt:** Private Dairy

- I. Producers' milk reaches private processors either directly and/or through milkman/milk contractors or through the producers' association. After processing and/or value addition, milk reaches consumers through marketing channel.
- II. Producers' milk reaches government/private processors directly and/or through milkman/contractors or producers' association and also through district milk union/state dairy federation. After processing and/or value addition, it reaches consumers through the marketing channel.
- III. Milk producers supply their milk to village dairy cooperative, which inter alia supplies to district milk union. The milk, after processing and/or value addition in the district milk union, reaches consumers either directly via marketing channel and/or through state dairy federation or national federation via marketing channel. The state dairy federation, for bulk marketing, sometimes operates through the national federation of cooperatives.



**Note:** In both the above exhibits, the milk volumes as well as the percentages, at the different stage of the level could not be presented since no study at national or state levels is available depicting such figures. Nevertheless, according to a data available, a broad distribution of milk produced in India is presented in Annexure 1. Out of the 98 million tones milk produced, around 44 per cent i.e. 43.12 million tones remain unprocessed, which is being either retained or sold at the rural level. The loose milk sold in the urban and peri-urban areas account for 19 per cent of the production i.e. 18.62 million tones. The processed packed milk, sold in liquid form in urban demand centers is 8 per cent i.e. 7.84 million tones of the total production. Value added milk products, manufactured by the organised sector, consumes 7 per cent of the milk production i.e. 6.86 million tones. The value added milk products, primarily indigenous, manufactured by the unorganised sector are 21.56 million tones, which accounts for 22 per cent of the total milk production in the country.

## Milk Policies

As stated earlier, Indian dairy development policies are primarily formulated by the government, both at the center and state levels. The central government formulates policies, which are being implemented by the States since constitutionally agriculture along with dairy and animal husbandry is the State subject. The Central government formulates policies through the Planning Commission of India. The dairy and animal husbandry programmes were initiated under the Key Village Development programme of the Second Five Year Plan of the Agriculture Ministry, which commenced in 1956. Third Five Year Plan onwards, dairy and animal husbandry were introduced separately as a sub-sector under the Agriculture development programme. The country is at the completion stage of the Tenth Five Year Plan and the Eleventh Plan is scheduled to commence soon.

With the growth of the dairy sector in India, the government created two separate ministries, one is the Ministry of Food Processing Industries (MFPI) and the other is the Department of Animal Husbandry and Dairying (DAHD), in 1991. The MFPI deals with policies concerning milk products such as value addition, whereas the DAHD deals with milk production and processing. Also, there are multi-institutional involvements under the domain of center and state governments. These institutions are either part of the government or financially supported by them. These institutions deal with dairy education and research, dairy development; milk products export promotion, inspection, quality testing, certifications, etc.

Besides, there are apex level organizations like the National Dairy Development Board, National Cooperative Dairy Federation of India, National Cooperative Dairy Corporation, State Dairy Cooperative Federation, etc. These organisations also formulate policies concerning dairy development as well as coordinate with the State and Central governments, to translate the various policies into action. However, these institutions are responsible for cooperative dairy development only.

There are no institutional supports similar to cooperative, provided by the governments, both at the Centre and State, for development of dairying in the private/corporate sectors. Besides, the government is neither funding nor giving any policy support to the unorganised (informal) sector for their sustenance. Nonetheless, both the private corporate and the unorganised (informal) sector do derive lateral benefits of the government policies, time to time initiated towards the overall growth of the country's dairy sector.



## Milk Pricing

The milk price, both production and selling, varies from region to region and from state to state commensurate with the production pattern and seasonal as well as regional variances in the country. The lean and flush season production ratio varies as high as 30:70. As stated earlier, both the milk farmers & the consumers' price difference are equally high between the milk surplus region/states to the milk deficient region/states in the country. Over and above, demand pulls and pushes of the production do also reflect on the milk pricing of the country. Consequent to the globalisation and opening up of the markets, the international prices have a bearing on the Indian milk prices, both in liquid and conserved forms. In India, ghee, milk powder and especially skimmed milk powder are the major price drivers. For instance, the price of skimmed milk powder recently spiraled by 30-40 per cent, consequent to rise in international prices. This has also reflected in both procurement and selling price of milk and milk products, in India. As referred above, the milk prices in the Eastern and Western regions are higher compared to Northern region, whereas the prices in Southern region are the lowest. The milk prices in the Northern region are closer to Western & Eastern regions.

In view of the above factors and in the absence of authentic data, to draw a milk price chart of a nation like India is rather difficult! However, based on the average milk producers and market prices prevailing in the country, an indicative status, in form of a price chart is prepared in Annexure 2.

## Smallholder Dairy Farmers

Out of the 1.13 billion Indian population, 70 percent live in villages. With reduction in the man-land ratio, cultivable landholding per family is decreasing from one generation to the other. This situation is leading to an ever increasing number of small holding farmers. Besides urban pressure on land, alternate job opportunities and unviable smallholding, there has been simultaneous increase in the number of landless in rural as well as urban India.

India has around 577 million small holders comprising of landless, small and marginal farmers. 350 million (70 million rural households) farmers keep dairy animals. Out of these households, 75 per cent (52 million households) are small, marginal and landless milk producers. The size of the herds vary from 1 - 2 to about 6 - 8. Amongst these 52 million small milk producing households, around 13 million are connected with the dairy cooperative institution, in India.

The 13 million small holder dairy farmers, who are connected with the cooperative institutions, are being socio-economically benefited. They are able to supply milk, twice a day i.e. in morning & evening and get an assured payment based on the quality of the milk supplied, which helps their daily cash flow. As a part of the package benefits provided by the cooperatives to its producer members, these small holders receive services like artificial insemination, veterinary services, feed supply, and assurance of regular payment, bonus, credit facilities and technical inputs, etc.

Other than the individual member benefits, village community as a whole, in certain progressive cooperatives, which have fully adopted the 'Anand Model', are additionally being benefited by having roads, schools, hospitals, etc. built out of the surplus



generated by the milk cooperatives. The multifaceted extension programmes, as a part of the benefit package, are also causing social engineering to a religiously diverse, multicultural and highly stratified Indian rural society. Thus, in the 'Anand Model' cooperative institutions, milk is being used as a tool for socioeconomic development.

### **Challenges facing the small dairy farmers, policy measures and the way ahead:**

The 39 million small dairy households who are not connected with the cooperative institutions, are facing numerous constraints, which include un-remunerative prices, shortage of quality feed and fodder, low genetic potential of dairy animals resulting in low productivity levels, non-availability of institutional finance, unreliable breeding services, poor animal health care facilities, poor extension services, poor rural infrastructure such as roads, assured supply of power. High transaction costs, poor marketing infrastructure, lack of information about price and market, poor knowledge, high delivery costs of specialized vaccines and drugs and exploitation by middlemen are other constraints faced by these farmers. These constraints erode the competitive advantage conferred by low labour cost of Indian small dairy holders.

### **Policy measures to enable greater participation of small dairy holders would need to include the following:**

Improving public and private infrastructure in rural areas  
Introduce an effective disease control at an affordable price  
Enhanced research and development especially low cost technologies  
Creation of a favourable investment framework  
Awareness creation and education about product quality, hygiene, and sanitation  
Refinement and implementation of sanitary and quality standards that can be met by smallholder dairy farmers.

Professionally managed cooperatives like the 'Anand Model' or 'Producers' Cooperative Company' and 'Contract Farming' are some examples of institutional models that can facilitate overcoming market barriers for the small dairy holders. However one of the major issues faced by the cooperatives is state interference in their functioning. At present, the cooperative institutions are registered under the society act of the state government, where the state register is the final authority. This leads to state government's using its machinery to thrive their political interest at the cost of professional interest of the cooperative institutions. For instance, a state minister or civil servant often become chairman or board member of the cooperative institutions and influence in decision making, especially in the areas of employment and commercial activities, etc, leading to unviable institutions. Such state interference has been one of the reasons why cooperative institutions in India have not been able to proliferate as rapidly as cooperatives in the developed countries in Oceania, OECD and EU nations.

Having stated the above, it is important to note that in the recent past, with the opening up of the markets, private corporate/multinationals is coming forward to participate especially in the areas of processing & marketing in the dairy sector. The latest registered list of the dairy plants, as mentioned earlier, clearly testifies it. This emerging situation has created additional market pull in the Indian dairy sector. Thus the role of supply chain is becoming of paramount importance in the dairy sector. While cooperative dominate the supply chain in the organised dairy sector, the middlemen (dudhijas) & contractors have been the major players still in the un-organized sector.



In the prevailing competitive environment, efforts are being made to safe guard the interest of small dairy holders, in India. Other than propagating the 'Anand Model', a new concept of "cooperative company" is being experimented in the organised dairy sector. The "cooperative company" is a new concept that is being introduced recently to remove government control in producer's cooperative. The 'Producer's Cooperative Company', can register under companies act and function similar to any private corporate. However, to maintain the cooperative ethos, the voting right of the share holders in the producers cooperative company does not commensurate with their share holding as in the private corporate. Critics fear that such an attempt may affect the fundamental principles of cooperatives and big producers might dominate over the small holders!

**Nonetheless, the concept is at a nascent stage and is under experimentation.**

While the institutional models will vary depending upon the production and market context, the key issue will be governance and ensuring small dairy producer's participation in decision-making. In addition to facilitating market access through collective action at the grassroots level, a number of other measures at the national and international level will be needed to enhance the ability of small dairy producers to compete in the emerging market environment. Some of these are listed below:

Productivity enhancement through promotion and integrated dairy systems.  
Better enforcement of environmental regulations. This is because smallholder mixed farming is generally more environment friendly than large-scale livestock production but there is no internalization of environmental costs in the latter. Better enforcement of environmental regulations is therefore likely to help smallholders.

**Improved service delivery including promotion of decentralized community driven village delivery of essential dairy services.**

Promotion of women's self-help groups as thrift and savings societies for meeting the credit needs of livestock farmers and for providing them instant cash credit for managing their household livestock enterprises. The organizations of these groups will need to be facilitated with the help of credible local NGOs and will require policy and funding support from national and international development agencies.

Promotion of village based extension mechanisms.  
Narrowing the knowledge gap is imperative and following measures are necessary:

Support and facilitate the process of informed policy making, therefore, it will be necessary to identify, analyze and address the factors that limit small dairy holder's market access.

Examine the effects of changing level and structure of demand on current marketing chains and responses of producers  
Thorough examination of competitiveness including an examination of production structure and scale economies

Examination of value chain from primary product to the final market in order to understand where value can be added for small dairy holders.  
Impact analysis of policies such as import duty on processing equipments, HACCP/food safety standards as barriers to smallholders, collective action legislation such as cooperative and contract laws.



Production impact of tariffs on inputs and competing production  
 Distributional impacts of policies on credit services, health services, breeding services and so on.

## Conclusion

While drawing conclusions, it has been attempted to summarise the Indian dairy scenario at the macro-, meso- and micro-levels, focusing its impact on the small dairy holders in the SWOT analysis presented below:

### Smallholder Dairy Farmer SWOT

Strengths	How to Build on Them
<p><b>Milk Production System</b></p> <p>Largest bovine population - 75% is being held by small dairy farmers; buffalo is an added advantage            Highest milk producer in the world</p> <p>Milk production is a subsystem of agriculture, based on crop residue and labour driven</p> <p>Milk production is low cost, energy efficient &amp; environment friendly</p> <p>Temperate weather facilitating low cost indigenous breeding and rearing</p> <p>Small dairy holders milk production is integrated to mix farming system</p> <p>Small holder dairying (2-8 animals) is easily manageable by utilizing family labour</p> <p>Small holders deploy low cost traditional animal husbandry practices</p>	<p><b>Milk Production System</b></p> <p>Small dairy holders' milk production needs to be gradually enhanced, on an incremental basis, by exposing them to training and extension activities on better husbandry, breeding practices, etc.            Optimise genetic potential of the existing herds.            Low cost, energy efficient and environmental friendly small holders' milk production should be kept in view while encouraging incremental milk production. Capital intensive, technology-driven production coupled with genetic upgradation as being practiced in the developed world, should be introduced to achieve higher productivity and improve quality. However, the small dairy holders should go for once their herd's sizes are suitable for it as well as they are exposed to deal with newer technologies.</p>
<p><b>Milk Procurement/Supply System</b></p> <p>National milk grid, established under the OFP, is a national network which provides access for the small dairy holders' widespread milk production system to the metro/major cities, in the country</p> <p>Availability of multi-supply chains as exhibited in the milk flow chart is added strength.</p>	<p><b>Milk Procurement/Supply System</b></p> <p>A greater policy thrust is needed to expand the supply chains. This includes expansion of the national milk grid to the length and breadth of the nation. These efforts would help those small holders, who have still not been able to either market their surpluses or depending on the unorganised (informal) sector.</p>
<p><b>Milk Processing and Value Addition</b></p> <p>Large numbers of modern processing</p>	<p><b>Milk Processing and Value Addition</b></p> <p>Continuous up-gradation of home grown</p>



<p>facilities established, in India, for processing, value addition.</p> <p>Strong homegrown low-cost technology base for indigenous milk product development</p> <p>Large number of dairy machineries, processing, packaging and testing facilities available in the country</p>	<p>&amp; modern technologies in milk processing and value addition is needed for Indian products to become compatible with the international products.</p> <p>Favorable policies to reduce taxes, duties and levies are essential to reduce capital investments, which would inter alia lower the processing/product cost. This would also encourage more investment in the dairy sector.</p>
<p><b>Marketing System</b></p> <p>National market for milk &amp; milk products, at present, is growing @ 15%</p> <p>Immense export potential with the gradual reduction of subsidies in EU &amp; OECD countries</p>	<p><b>Marketing System</b></p> <p>The existing processing &amp; marketing infrastructure should be fully utilized. Besides additional facilities to be created to attain commanding share in the high growth national market. With the gradual reduction of subsidies country's export growth would multiply. These would help higher price realisation inter alia better return to the small dairy holders.</p>
<p><b>INSTITUTIONAL (ORGANISED) MILK MARKETING SYSTEM</b></p> <p>Large manpower pool, both unskilled &amp; skilled are available at much cheaper costs</p> <p>India has a network of 9 dairy science colleges, 31 veterinary colleges, 80 agricultural colleges &amp; research institutions, affiliated to 28 State agricultural universities</p> <p>Cow dung is a by-product for organic manure &amp; input for renewable energy</p>	<p><b>Research/Education/Manpower System</b></p> <p>The benefits of research/education/ manpower development should also percolate to the grassroots by involving govt. &amp; non-govt. institutions like cooperative, NGOs, etc. Increase in organic manure &amp; renewable energy usages, would provide additional income to the small dairy holders.</p>
<p><b>Institutional Systems &amp; Policies</b></p> <p>Empowerment of backward &amp; weaker section, especially women at the grass roots</p> <p>Round the year engagement of labours, rural &amp; urban/peri urban</p> <p>Landless are making a reasonable living from dairying</p> <p>Reduction in population shift from rural to urban</p>	<p><b>Institutional Systems &amp; Policies</b></p> <p>The 'Anand Model" of dairy development is an effective institutional policy framework. Similar institutional models involving small holders should also be created such as Cooperative Company, Producers' associate production/NGO/Contract farming, and Private- Cooperative participation, etc, by introducing suitable policies. Besides similar institutional models should also be replicated in other agri-business sector so that, with larger job generation at the grassroots, rural population shift to cities</p>



Improvement in hygienic, sanitary & modern living habits, besides self help & community development	could be reduced.
<b>Weaknesses</b>	<b>How to Correct Them</b>
<p><b>Milk Production System</b></p> <p>Though largest bovine population in India, but productivity per animal is one of the lowest            Ban on cow slaughtering            Higher lean-flush ratio, besides seasonal &amp; regional imbalances            Quality of milk is the weakest link in the smallholder dairying            Inadequate veterinary care &amp; ineffective disease control mechanism. Insufficient availability of nutritionally balanced feeds &amp; fodders.            Buffalo milk sometimes, instead of boon becomes a bane.</p>	<p><b>Milk Production System</b></p> <p>The Government, both in the centre &amp; States, who have been primarily responsible for most of these activities, could not produce requisite results. Some of the apex institutions like NDDDB, 'Anand Model' Cooperatives, NGOs like BAIF, etc. have made a remarkable impact to improve the weaknesses, but in country as a whole lot more to be done! Growth of these types of institutions would help to correct existing weaknesses prevailing in the system.            Private participation is at nascent stage, which is to be encouraged.            Buffaloes though produce richer milk, is receiving adverse publicity, particularly from the developed world. Buffalo milk producing countries should make collective efforts to counter it, since in most of these countries; buffalo is the support system for the small dairy holders.</p>
<p><b>Milk Procurement &amp; Supply Systems</b></p> <p>Thinly spread milk production system leading to high transportation cost            Due to high perishability coupled with inadequate infrastructure facilities including cold chain are leading to higher sourage losses</p>	<p><b>Milk Procurement &amp; Supply Systems</b></p> <p>The milk production as stated earlier need to be enhanced so that production density per square kilometer increases.            Gradual exposure to scientific and modern animal husbandry practices besides availability of cold chain would help the small holder to reduce milk sourage.</p>
<p><b>Milk Processing &amp; Marketing Systems</b></p> <p>Modern processing &amp; marketing technologies require high investment, which is unaffordable/inaccessible to small dairy holders            Inadequate/unaffordable modern milking facilities at the grass roots, affecting quality &amp; clean milk production</p>	<p><b>Milk Processing &amp; Marketing Systems</b></p> <p>The remedial measures, in general are dealt with. Besides, a greater policy thrust is required for lowering the levies as well as softer funding.            While milk production in the existing milk processing areas are required to be increased, new processing capacities to be built where such facilities are either not available or insufficient.</p>



<p>Though huge processing capacity built, but these are not evenly distributed, depriving accessibility to a large number of small dairy holders</p>	
<p><b>Research/Education/Manpower System</b></p> <p>Benefit of research development/education are inaccessible to the majority of small dairy holders</p>	<p><b>Research/Education/Manpower System</b></p> <p>Already dealt with</p>
<p><b>Institutional Systems &amp; Policies</b></p> <p>Benefit of extension services are not available to the majority of the small holders</p> <p>Small dairy holders are prone to higher financial risk, particularly who are having 2 animals, due to either one of them dies or not in lactation</p> <p>Unaffordable high cost funding from middlemen, milk contractor or private processors</p> <p>Inadequate insurance facilities</p> <p>Lack of institutional support, similar to Anand model, to the majority of small holders</p> <p>No technical input or production subsidy available to the dairy farmers as available to the agriculture farmers</p> <p>Inadequate policy initiative/ fiscal/physical benefits available to the small dairy holders.</p> <p>Large numbers of 'Anand model cooperative', who have taken financial support from the government, are highly controlled.</p> <p>The basic concept of Anand model i.e. producer owned institution, managed by professional, appointed by them are missing in these institution. The cooperatives in India are governed by archaic rules and regulations, mostly originated during colonial rule. This is, to a certain extent, adversely affecting the growth of cooperative dairying in India, particularly after the removal of protection for them.</p>	<p><b>Institutional Systems &amp; Policies</b></p> <p>Institutional policies though formulated, from time to time, by the government, but due to poor implementation, the requisite results are not achieved.</p> <p>The new policies should encourage correct replication of the 'Anand Model'. Several methods are being deployed to ensure lesser control of government in the management of the 'Anand Model' cooperatives. One of it is the concept of producers' companies. This concept is being propagated in the country as a means for cooperative to function more professionally, reducing much involvement of the government.</p> <p>Besides the remedial measures, as refereed earlier, newer policy initiatives/institutional systems should also be explored to correct these major weaknesses in the Indian dairying!</p>



## Dairy Strategies Prospects

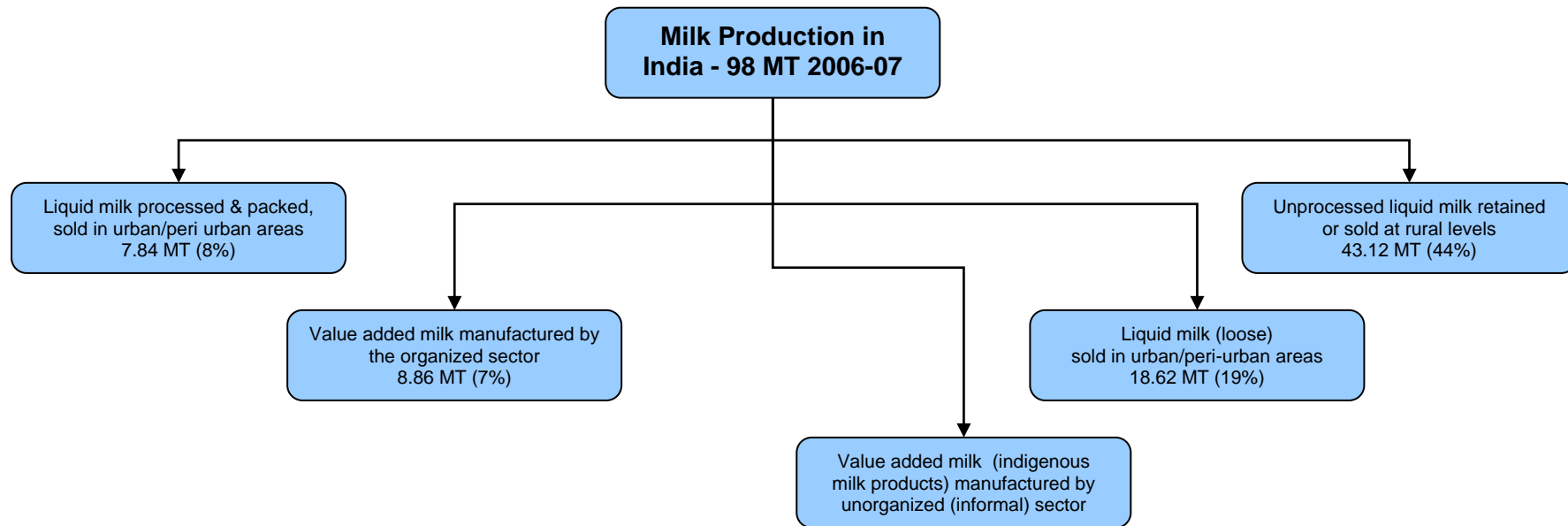
The Indian dairy story, establishes the fact that in a country, where huge population of smallholder exist, dairying can not be transformed radically at par with the developed dairying nations, into a productive-oriented, technology driven profit making business enterprise. It has to continue as a labour-driven smallholder enterprise having low input-output cost ratio, adoption of low cost home grown technologies and keeping socio-economic benefits as the prime objective! Such an institution is extremely relevant in a scenario where unemployment is mounting, leading to economic disparities as well as social disorder!

Lessons the country has learnt from the past experiences in Indian dairying is that the 'Anand Model' of cooperative dairy development should be the answer to foster the growth of the small dairy holders both at the regional as well as national levels. However, there are problems in propagation of such a model, particularly where the government interventions are high and the basic structure of the model is being diluted.

With the opening up of the Indian dairy sector, the problems currently faced, both in the demand and supply side, along with restructuring of the existing institutional framework are being reviewed by the policy makers. The national strategy is to sustain the basic character of Indian dairying, at the same time, to deal with the competitive environment, arising out of globalization. Making a real impact on the ground, however, will require going beyond the identification of constraints, policy prescriptions/options and institutional models.

It requires integrating this analysis with the larger political economy of the country. A close examination of policy processes, including legislation, will be the first step towards identifying ways of empowering the farmers with political voice and influence. This means securing commitment at the highest political level and nurturing appropriate organizations and leaders. This would enable cooperative institutions such as 'Anand Model', 'Cooperative Company' to become an effective tool for fostering the growth of small dairy holders. Besides, building credible alliances with NGO's, dairy education institutions, as well as the private/corporate sector participation will play a crucial role in this endeavour!

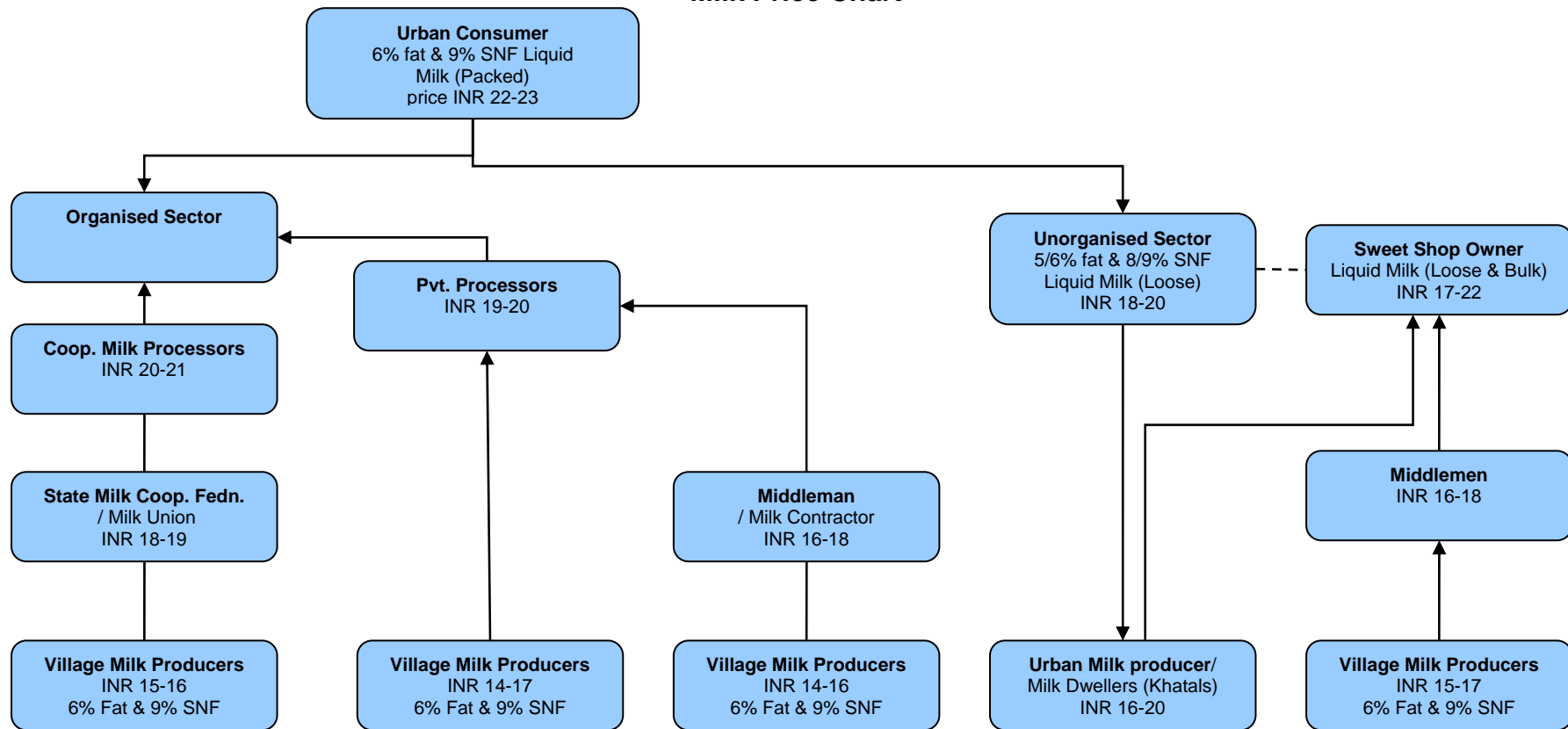
Milk Flow Chart



MT- Million Tonnes per annum

Source: MoA/Rabo Bank/IDA

Milk Price Chart



INR : Indian National Rupee

Source: NDDB/IDA

Note: Varieties of packed and loose milk, milk with different fat percentages are being sold in the market. Similarly, village & urban milk producers, also use different devices to sell their milk of varied fat content. However to keep price, 6% fat & 9% SNF have been kept as basic.

**Lessons Learned Studies — India**

*By*

**Animesh Banerjee**



## Background

- Organised Indian dairying rooted in early part of 20th Century, during the British rule.
- Milk production is dominated by small & marginal landholding farmers & landless labourers. 75% of 97.7 million farm families in India possess cattle and/or buffalo.
- India is holding 19 per cent of the world livestock population. Cattle and buffalo population is around 185 and 98 millions, respectively.
- Indian dairying was in a unsatisfactory low-level equilibrium. Government tried different strategies to develop Indian dairying, but failed, other than Anand dairy cooperative system.
- Operation Flood launched by NDDDB in 1970, with the support of multilateral international agencies, to replicate Anand Model, brought White Revolution in India.
- Liberation policy, introduced in 1991, removed restrictions, leading to registration of 678 dairy plants, having total 26.37 MT annual capacity. Out of this, private/multinational has registered 10.36 MT/year plant capacity.

## Situational Analysis

- Situational Analysis
- India is the world's largest milk producer — 98 million tonne per annum.
- Low milk yield vis-a-vis low production density.
- High cost milk transportation.
- Higher lean-flush ratio, seasonal and regional variations.
- Out of the 600 districts, 350 are high or medium dairy potential districts. Remaining 250 are having low or very low potential.
- 40-50% of milk produced is retained at producer level. Organised sector collects milk 12-15%, remaining 35-38% is handled by unorganised sector.
- Several types of milk supply chains exist, both in organised & unorganised sector.

## Smallholder Dairy Farmers

- Out of 1.13 billion Indian population, at present, around 70% lives in villages
- 52 million households are small, marginal and landless milk producers. Amongst these, around 13 million are connected with cooperatives.
- Smallholder connected with cooperatives are receiving several tangible & intangible benefits.
- The balance 39 million households are facing numerous constraints.
- With the growth of private corporate/multinationals, market accessibility increased, especially for those smallholder who are not connected with cooperative system

## Conclusion

- Low cost, energy-efficient, environment friendly smallholder enterprise is a better option for the smallholder.
- Milk quality is a serious constraint, especially for the small dairy holder.
- Lack of institutional support vis-a-vis supply chains are affecting the growth of the smallholder dairying.



- Lack of accessibility to the benefits of research/education/manpower system by the smallholder.
- Milk production & processing should commensurate as well as easily accessible to the smallholder.
- Smallholder are prone to higher financial risk due to unaffordable high cost funding and poor price realisation

## Strategies

- Small dairy holder milk production to be gradually enhanced on incremental basis, optimising existing genetic potential.
- Smallholder enterprise continue as a labour-driven having low input-output cost ratio, with socio-economic benefits as the prime objective.
- Capital-intensive, technology driven production system should be introduced once the smallholder dairy system learn to deal with it. Priority to be given to the higher and medium milk producing regions of the country.
- Continuous upgradation of homegrown technologies is necessary.
- Anand Model may be replicated, with suitable modifications, as necessary, besides alternative institutional framework should also be explored.
- The national strategy should be to sustain the basic character of the Indian dairying, at the same time, to deal with the competitive environment, arising out of the globalisation!

**List of Selective Publications about the Dairy Development in India**

	<b>Book's Name</b>	<b>Author's Name</b>	<b>Publisher's Name</b>
1.	An Unfinished Dream	V. Kurien	Tata McGraw-Hill Pub. Com Ltd.
2.	The Amul India Story	Ruth Heredia	Tata McGraw-Hill Pub. Com Ltd.
3.	Livestock and Livelihoods	Vinod Ahuja	NDDB & India and Food & Agriculture Organization
4.	A Guide Book of HACCP Implementation of Food Industry	Vijay Sardana	Somaiya Pub. Pvt. Ltd.
5.	A Textbook of Animal Nutrition	D.N. Verma	Kalyani Publishers
6.	A Textbook of Animal Health & Hygiene	Jagdish Prasad	Kalyani Publishers
7.	Management Kurien – Style The Story of the White Revolution	M V Kamath	Konark Publishers Pvt. Ltd.
8.	Principles and Practices of Dairy Farm Management	Jagdish Prasad	Kalyani Publishers
9.	Textbook of Dairy Chemistry	M P Mathur, D Data Roy and P Dinakar	ICAR
10.	Outlines of Dairy Technology	Sukumar De	Oxford University Press
11.	Handbook of Dairy Industry Technology of Dairy Products	J V Parikh	Small Business Publications
12.	Indian Dairy Products	K S Rangappa, K T Achaya	Asia Publishing House
13.	Dairy Farming & Milk Production	C P Anantkrishnan	Shri Lakshmi Publications
14.	Dairying and Farm Diversification	Gurbhagwant Singh Kahlon	Punjab Institute for Sustainable Development
15.	Dairy Farming in Tropics	V Venkatasubramanian and R M Fulzele	MD Publications Pvt. Ltd.
16.	Fundamentals of Dairy Microbiology	J B Prajapati	Akta Prakashan
17.	Basics of Mozzarella Cheese Making	K G Upadhyay	Gujarat Agril. University
18.	Trade Liberalization and Indian Dairy Industry	Vijay Paul Sharma Pritee Sharma	Oxford & IBH Publishing Co. Pvt. Ltd.
19.	A Practical Guide for Implementation of Integrated ISO 9001 HACCP System for Food Processing Industry	Sohrab	Allied Publishers Ltd.
20.	Dairy Farming	V M Rao	Reliance Publishing House
21.	Indian Dairy Industry	G C Chakraborty	G C Chakraborty behalf of Dr. Chawla Dairy Information Centre Pvt. Ltd.
22.	Indian Dairyman		Indian Dairy



		<b>Association</b>
<b>23.</b>	Indian Journal of Dairy Science	<b>Indian Dairy Association</b>
<b>24.</b>	Dairy Planners	<b>Pixie Publication India P (Ltd.)</b>
<b>25.</b>	Livestock International	<b>Indian Herbs Research &amp; Supply Co. Ltd.</b>
<b>26.</b>	Livestock Feed & Trends	<b>CLFMA of India</b>
<b>27.</b>	Indian Jl. of Dairy & Bio Science	<b>Malhotra Publishing House</b>
<b>28.</b>	Indian Jl. of Animal Sciences	<b>ICAR</b>
<b>29.</b>	Indian Veterinary Journal	<b>Indian Veterinary Association</b>
<b>30.</b>	NDRI (Newsletter)	<b>National Dairy Research Institute</b>
<b>31.</b>	<b>Food &amp; Beverage (Newspaper)</b>	<b>Saffron Media Pvt. Ltd.</b>