CHAPTER –III

AN OVERVIEW OF INDIAN DAIRY INDUSTRY, DAIRY CO-OPERATIVES AND PROFILE OF THE STUDY AREA

This chapter gives an overview about the dairy industry in India, particularly dairy co-operatives, its importance in the economy of the Nation and the growth aspects. This chapter also outlines the profile of the study area.

3.1 PROFILE OF INDIAN DAIRY INDUSTRY

Dairy industry is of crucial importance to India. The country is the world’s largest milk producer, accounting for more than 20% of world’s total milk production. It is the world’s largest consumer of dairy products, consuming almost 100% of its own milk production. Dairy products are a major source of cheap and nutritious food to millions of people in India and the only acceptable source of animal protein for large vegetarian segment of Indian population, particularly among the landless, small and marginal farmers and women. Dairying has been considered as one of the activities aimed at alleviating the poverty and unemployment especially in the rural areas in the rain-fed and drought-prone regions.

In India, about three-fourth of the population live in rural areas and about 38% of them are poor. In 1986-87, about 73% of rural households own livestock. Small and marginal farmers account for three-quarters of these households owning livestock, raising 56% of the bovine and 66% of the sheep population. According to the National Sample Survey of 2013-2014, livestock sector produces regular employment to more than 15 million persons in principal status and 10.6 million in subsidiary status, which constitute about 10% of the total work force. This clearly indicates the importance of this sector in the development of the Nation.

It also offers opportunities galore to entrepreneurs worldwide, who wish to capitalize on one of the world's largest and fastest growing markets for milk and milk products. A bagful of 'pearls' awaits the international dairy processor in India. The Indian dairy industry is rapidly growing, trying to keep pace with the galloping progress around the world. The globalisation and liberalization of the Indian economy beckons to MNC's and foreign investors alike.
India’s dairy sector is expected to triple its production in the next 10 years in view of expanding potential for export to Europe and the West. Moreover with WTO regulations expected to come into force in coming years all the developed countries which are among big exporters today would have to withdraw the support and subsidy to their domestic milk products sector. Also India today is the lowest cost producer of per litre of milk in the world, at 27 cents, compared with the U.S' 63 cents, and Japan’s $2.8 dollars. Also to take advantage of this lowest cost of milk production and increasing production in the country multinational companies are planning to expand their activities here. Some of these milk producers have already obtained quality standard certificates from the authorities. This will help them in marketing their products in foreign countries in processed form.

With rapid increase in domestic demand for milk and milk-based products, the dairy industry in India is likely to reach more than Rs 5 lakh crore by 2020, industry body-Associated Chambers of Commerce and Industry of India (Assocham) said today. Milk production is likely to reach about 190 million tonne in 2020 from current level of more than 123 million tonne, according to a study conducted by Assocham.

3.1.2 Dairy industry – Background

More than fifty percent of the buffaloes and twenty percent of the cattle in the world are found in India and most of these are milch cows and milch buffaloes. Indian dairy sector contributes the large share in agricultural gross domestic products. Presently there are around 70,000 village dairy cooperatives across the country. The co-operative societies are federated into 170 district milk producers unions, which is turn has 22-state cooperative dairy federation. Milk production gives employment to more than 72mn dairy farmers. In terms of total production, India is the leading producer of milk in the world followed by USA.

While world milk production declined by 2 per cent in the last three years, according to FAO estimates, Indian production has increased by 4 per cent. The milk production in India accounts for more than 13% of the total world output and 57% of total Asia's production. The top five milk producing nations in the world are India, USA, Russia, Germany and France.
3.1.3 Milk Yield comparison:

<table>
<thead>
<tr>
<th>Country</th>
<th>Milk Yield (Kgs per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>7002</td>
</tr>
<tr>
<td>UK</td>
<td>5417</td>
</tr>
<tr>
<td>Canada</td>
<td>5348</td>
</tr>
<tr>
<td>New Zealand</td>
<td>2976</td>
</tr>
<tr>
<td>Pakistan</td>
<td>1052</td>
</tr>
<tr>
<td>India</td>
<td>795</td>
</tr>
<tr>
<td>World (Average)</td>
<td>2021</td>
</tr>
</tbody>
</table>

Source: Export prospects for agro-based industries, World Trade Centre, Mumbai.

Although milk production has grown at a fast pace during the last three decades (courtesy: Operation Flood), milk yield per animal is very low. The main reasons for the low yield are

- Lack of use of scientific practices in milching.
- Inadequate availability of fodder in all seasons.
- Unavailability of veterinary health services.

3.1.4 Production of milk in India

As per NDDB, the Indian dairy industry is all set to experience high growth rates in the next eight years with demand likely to reach 200 million tonnes by 2022 from 132 million tonnes in 2013. Presently, only 20% of the milk production comes from the organized sector comprising co-operatives and private dairies. The paramount factors driving the growth in the dairy sector include rising disposable incomes, advent of nuclear families and fast/instant food gaining ground in India. Other factors such as structural changes in food habits, expansion of fast food chains and popularity of pizzas and pastas aided the usage of milk variants of mozzarella cheese, processed cheese and flavored milk etc.
<table>
<thead>
<tr>
<th>Year</th>
<th>Production in million MT</th>
<th>Per capita availability (gms/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991-92</td>
<td>55.7</td>
<td>178</td>
</tr>
<tr>
<td>1992-93</td>
<td>58</td>
<td>182</td>
</tr>
<tr>
<td>1993-94</td>
<td>60.6</td>
<td>187</td>
</tr>
<tr>
<td>1994-95</td>
<td>63.8</td>
<td>194</td>
</tr>
<tr>
<td>1995-96</td>
<td>66.2</td>
<td>197</td>
</tr>
<tr>
<td>1996-97</td>
<td>69.1</td>
<td>202</td>
</tr>
<tr>
<td>1997-98</td>
<td>72.1</td>
<td>207</td>
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<tr>
<td>1998-99</td>
<td>75.4</td>
<td>213</td>
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<td>1999-00</td>
<td>78.3</td>
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<td>2000-01</td>
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<td>220</td>
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<tr>
<td>2001-02</td>
<td>84.4</td>
<td>225</td>
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<tr>
<td>2002-03</td>
<td>86.2</td>
<td>230</td>
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<tr>
<td>2003-04</td>
<td>88.1</td>
<td>231</td>
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<tr>
<td>2004-05</td>
<td>92.5</td>
<td>233</td>
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<tr>
<td>2005-06</td>
<td>97.1</td>
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<tr>
<td>2006-07</td>
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<td>251</td>
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<tr>
<td>2007-08</td>
<td>107.9</td>
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<tr>
<td>2008-09</td>
<td>112.2</td>
<td>266</td>
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<tr>
<td>2009-10</td>
<td>114.6</td>
<td>273</td>
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<tr>
<td>2010-11</td>
<td>121.8</td>
<td>281</td>
</tr>
<tr>
<td>2011-12</td>
<td>127.9</td>
<td>290</td>
</tr>
<tr>
<td>2012-13</td>
<td>132.4</td>
<td>295</td>
</tr>
</tbody>
</table>

*Source: Department of Animal Husbandry, GoI*

### 3.1.5 Operation Flood

The transition of the Indian milk industry from a situation of net import to that of surplus has been led by the efforts of National Dairy Development Board's Operation Flood programme under the aegis of the former Chairman of the board Dr. Kurien. Launched in 1970, Operation Flood has led to the modernization of India's dairy sector and created a strong network for procurement processing and distribution of milk by the co-operative sector. Per capita availability of milk has increased from 132 gm per day in 1950 to over 220 gm per day in 1998. The main thrust of Operation Flood was to organize dairy cooperatives in the milk shed areas of the village, and to link them to the four Metro cities, which are the main markets for milk. The efforts undertaken by NDDB have not only led to enhanced production, improvement in methods of processing and development of a strong marketing network, but have also led to the emergence of dairying as an important source of employment and income generation in the rural areas. It has also led to an
improvement in yields, longer lactation periods, shorter calving intervals, etc through the use of modern breeding techniques. Establishment of milk collection centers, and chilling centers has enhanced life of raw milk and enabled minimization of wastage due to spoilage of milk. Operation Flood has been one of the world's largest dairy development programme and looking at the success achieved in India by adopting the co-operative route, a few other countries have also replicated the model of India's White Revolution.

3.1.6 The Indian Market - A Pyramid

Milk has been an integral part of Indian food for centuries. The per capita availability of milk in India has grown from 178 gm per person per day in 1991-92 to 295gm in 2012-13. However a large part of the population cannot afford milk. At this per capita consumption it is below the world average of 285 gm and even less than 220 gm recommended by the Nutritional Advisory Committee of the Indian Council of Medical Research.

There are regional disparities in production and consumption also. The per capita availability in the north is 278 gm, west 174 gm, south 148 gm and in the east only 93 gm per person per day. This disparity is due to concentration of milk production in some pockets and high cost of transportation. Also the output of milk in cereal growing areas is much higher than elsewhere which can be attributed to abundant availability of fodder, crop residues, etc which have a high food value for milch animals.

In India about 46 per cent of the total milk produced is consumed in liquid form and 47 per cent is converted into traditional products like cottage butter, ghee, paneer, khoya, curd, malai, etc. Only 7 per cent of the milk goes into the production of western products like milk powders, processed butter and processed cheese. The remaining 54% is utilized for conversion to milk products. Among the milk products manufactured by the organized sector some of the prominent ones are ghee, butter, cheese, ice creams, milk powders, malted milk food, condensed milk infants foods etc. Of these ghee alone accounts for 85%.

It is estimated that around 20% of the total milk produced in the country is consumed at producer-household level and remaining is marketed through various
cooperatives, private dairies and vendors. Also of the total produce more than 50% is procured by cooperatives and other private dairies. While for cooperatives of the total milk procured 60% is consumed in fluid form and rest is used for manufacturing processed value added dairy products; for private dairies only 45% is marketed in fluid form and rest is processed into value added dairy products like ghee, makhan etc.

Still, several consumers in urban areas prefer to buy loose milk from vendors due to the strong perception that loose milk is fresh. Also, the current level of processing and packaging capacity limits the availability of packaged milk.

The preferred dairy animal in India is buffalo unlike the majority of the world market, which is dominated by cow milk. As high as 98% of milk is produced in rural India, which caters to 72% of the total population, whereas the urban sector with 28% population consumes 56% of total milk produced. Even in urban India, as high as 83% of the consumed milk comes from the unorganized traditional sector. Presently only 12% of the milk market is represented by packaged and branded pasteurized milk, valued at about Rs. 8,000 crores. Quality of milk sold by unorganized sector however is inconsistent and so is the price across the season in local areas. Also these vendors add water and caustic soda, which makes the milk unhygienic.

India's dairy market is multi-layered. It's shaped like a pyramid with the base made up of a vast market for low-cost milk. The bulk of the demand for milk is among the poor in urban areas whose individual requirement is small, maybe a glassful for use as whitener for their tea and coffee. Nevertheless, it adds up to a sizable volume - millions of litres per day. In the major cities lies an immense growth potential for the modern sector. Presently, barely 778 out of 3,700 cities and towns are served by its milk distribution network, dispensing hygienically packed wholesome, quality pasteurized milk. According to one estimate, the packed milk segment would double in the next five years, giving both strength and volume to the modern sector. The narrow tip at the top is a small but affluent market for western type milk products.
3.1.7 Growing Volumes

The effective milk market is largely confined to urban areas, inhabited by over 25 per cent of the country's population. An estimated 50 per cent of the total milk produced is consumed here. By the end of the twentieth century, the urban population is expected to increase by more than 100 million to touch 364 million in 2000 a growth of about 40 per cent. The expected rise in urban population would be a boon to Indian dairying. Presently, the organized sector both cooperative and private and the traditional sector cater to this market.

The consumer access has become easier with the information revolution. The number of households with TV has increased from 23 million in 1989 to 45 million in 1995. About 34 per cent of these households in urban India have access to satellite television channel.

Of the three A's of marketing - availability, acceptability and affordability, Indian dairying is already endowed with the first two. People in India love to drink milk. Hence no efforts are needed to make it acceptable. Its availability is not a limitation either, because of the ample scope for increasing milk production, given the prevailing low yields from dairy cattle. It leaves the third vital marketing factor affordability. How to make milk affordable for the large majority with limited purchasing power? That is essence of the challenge. One practical way is to pack milk in small quantities of 250 ml or less in polythene sachets. Already, the glass bottle for retailing milk has given way to single-use sachets which are more economical. Another viable alternative is to sell small quantities of milk powder in mini-sachets, adequate for two cups of tea or coffee.

3.1.8 Marketing Strategy for dairy industry

Two key elements of marketing strategy for 2000 AD are: Focus on strong brands and, product mix expansion to include UHT milk, cheese, ice creams and spreads. The changing marketing trends will see the shift from generic products to the packaged quasi, regular and premium brands. The national brands will gradually edge out the regional brands or reduce their presence. The brand image can do wonders to a product's marketing as is evident from the words of Perfume Princess Coco Channel: In the factory, we pack perfume; in the market, we sell hope!
3.1.9 Emerging Dairy Markets

- **Food service institutional market:** It is growing at double the rate of consumer market.

- **Defense market:** An important growing market for quality products at reasonable prices.

- **Ingredients market:** A boom is forecast in the market of dairy products used as raw material in pharmaceutical and allied industries.

- **Parlour market:** The increasing away-from-home consumption trend opens new vistas for ready-to-serve dairy products which would ride piggyback on the fast food revolution sweeping the urban India.

India, with her sizable dairy industry growing rapidly and on the path of modernization, would have a place in the sun of prosperity for many decades to come. The one index to the statement is the fact that the projected total milk output over the next 15 years would exceed 7000 million tonnes which is twice the total production of the past 15 years!

3.1.10 Penetration of milk products

Western table spreads such as butter, margarine and jams are not very popular in India. All India penetration of butter/margarine is only 4%. This is also largely represented by urban areas, where penetration is higher at 9%. In rural areas, butter/margarine have penetrated in 2.1% of households only. The use of these products in the large metros is higher, with penetration at 15%.

Penetration of cheese is almost nil in rural areas and negligible in the urban areas. Per capita consumption even among the cheese-consuming households is a poor 2.4kg pa as compared to over 20kg in USA. The lower penetration is due to peculiar food habits, relatively expensive products and also non-availability in many parts of the country. Butter, margarine and cheese products are mainly manufactured by organized sector.

Similarly, penetration of ghee is highest in medium sized towns at 37.2% compared to 31.7% in all urban areas and 21.3% in all rural areas. The all India penetration of ghee is 24.1%. In relative terms, penetration of ghee is significantly
higher in North and West, which are milk surplus regions. North accounts for 57% of ghee consumption and West for 23%, South & East together account for the balance 20%. A large part of ghee is made at home and by small/ cottage industry from milk. The relative share of branded products in this category is very low at around 1-2%.

Milk powder and condensed milk have not been able to garner any significant consumer acceptance in India as indicated by a very low 4.7% penetration. The penetration is higher at 8.1% in urban areas and lower at 3.5% in rural areas. Within urban areas, it is relatively higher in medium sized towns at 8.5% compared to 7.7% in a large metros.

3.1.11 Market Size And Growth

Market size for milk (sold in loose/ packaged form) is estimated to be 36mn MT valued at Rs470bn. The market is currently growing at round 4% pa in volume terms. The milk surplus states in India are Uttar Pradesh, Punjab, Haryana, Rajasthan, Gujarat, Maharashtra, Andhra Pradesh, Karnataka and Tamil Nadu. The manufacturing of milk products is concentrated in these milk surplus States. The top 6 states viz. Uttar Pradesh, Punjab, Madhya Pradesh, Rajasthan, Tamil Nadu and Gujarat together account for 58% of national production.

Milk production grew by a mere 1% pa between 1947 and 1970. Since the early 70’s, under Operation Flood, production growth increased significantly averaging over 5% pa.

About 75% of milk is consumed at the household level which is not a part of commercial dairy industry. Loose milk has a larger market in India as it is perceived to be fresh by most consumers. In reality however, it poses a higher risk of adulteration and contamination.

3.1.12 Major Players

The packaged milk segment is dominated by the dairy cooperatives. Gujarat Co-operative Milk Marketing Federation (GCMMF) is the largest player. All other local dairy cooperatives have their local brands (For e.g. Gokul, Warana in Maharashtra, Saras in Rajasthan, Verka in Punjab, Vijaya in Andhra Pradesh, Aavin
in Tamil Nadu, etc). Other private players include J K Dairy, Heritage Foods, Indiana Dairy, Dairy Specialties, etc. Amrut Industries, once a leading player in the sector has turned bankrupt and is facing liquidation.

3.1.13 Packaging Technology

Milk was initially sold door-to-door by the local milkman. When the dairy co-operatives initially started marketing branded milk, it was sold in glass bottles sealed with foil. Over the years, several developments in packaging media have taken place. In the early 80's, plastic pouches replaced the bottles. Plastic pouches made transportation and storage very convenient, besides reducing costs. Milk packed in plastic pouches/bottles have a shelf life of just 1-2 days, that too only if refrigerated. In 1996, Tetra Packs were introduced in India. Tetra Packs are aseptic laminate packs made of aluminum, paper, board and plastic. Milk stored in tetra packs and treated under Ultra High Temperature (UHT) technique can be stored for four months without refrigeration. Most of the dairy co-operatives in Andhra Pradesh, Tamil Nadu, Punjab and Rajasthan sell milk in tetra packs. However tetra packed milk is costlier by Rs5-7 compared to plastic pouches. In 1999-00 Nestle launched its UHT milk. Amul too re-launched its Amul Taaza brand of UHT milk. The UHT milk market is expected to grow at a rate of more than 10-12% in coming years.

3.1.14 Export Potential

India has the potential to become one of the leading players in milk and milk product exports.

a. **Locational advantage** : India is located amidst major milk deficit countries in Asia and Africa. Major importers of milk and milk products are Bangladesh, China, Hong Kong, Singapore, Thailand, Malaysia, Philippines, Japan, UAE, Oman and other gulf countries, all located close to India.

b. **Low Cost Of Production** : Milk production is scale insensitive and labour intensive. Due to low labour cost, cost of production of milk is significantly lower in India.
c. **Quality**: Significant investment has to be made in milk procurement, equipments, chilling and refrigeration facilities. Also, training has to be imparted to improve the quality to bring it up to international standards.

d. **Productivity**: To have an exportable surplus in the long-term and also to maintain cost competitiveness, it is imperative to improve productivity of Indian cattle.

There is a vast market for the export of traditional milk products such as ghee, paneer, shrikh and, rasgolas and other ethnic sweets to the large number of Indians scattered all over the world

**India's exports of milk products**

<table>
<thead>
<tr>
<th>Description (Quantity, M T.; Value, Rs. million)</th>
<th>1995-96</th>
<th>1996-97</th>
<th>1997-98</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skimmed milk powder</td>
<td>4,638.62</td>
<td>3,35.32</td>
<td>282.70</td>
</tr>
<tr>
<td>Milk and Milk Food for babies</td>
<td>8.27</td>
<td>2.019</td>
<td>111.37</td>
</tr>
<tr>
<td>Milk cream</td>
<td>332.23</td>
<td>28.04</td>
<td>1.00</td>
</tr>
<tr>
<td>Sweetened condensed milk</td>
<td>41.73</td>
<td>2.84</td>
<td>9.22</td>
</tr>
<tr>
<td>Whey</td>
<td>78.46</td>
<td>3.75</td>
<td>11.50</td>
</tr>
<tr>
<td>Ghee/Butter/Butter oil</td>
<td>7,895.08</td>
<td>431.1</td>
<td>299.97</td>
</tr>
<tr>
<td>Cheese</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Fresh</td>
<td>0.10</td>
<td>0.013</td>
<td>-</td>
</tr>
<tr>
<td>(b) Processed</td>
<td>5.67</td>
<td>1.20</td>
<td>2.1</td>
</tr>
<tr>
<td>(c) Other</td>
<td>66.64</td>
<td>8.35</td>
<td>36.78</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>8,72.7</td>
<td>52.4</td>
</tr>
</tbody>
</table>

e. **Dairy/food processing equipment**: 

Potential exists for manufacturing and marketing of cost competitive food processing machinery of world-class quality.
f. Food packaging equipment

Opportunities lie in the manufacturing of both machinery and packaging materials that help develop brand loyalty and a clear edge in the marketing of dairy foods.

g. Distribution channels

For refrigerated and frozen food distribution, a world class cold chain would help in providing quality assurance to the consumers around the region.

h. Retailing

There is scope for standardizing and upgrading food retailing in major metropolitan cities to meet the shopping needs of a vast middle class. This area includes grocery stores of European and North American quality, warehousing and distribution.

i. Product development

- Dairy foods can be manufactured and packaged for export to countries where Indian food enjoys basic acceptance. The manufacturing may be carried out in contract plants in India. An option to market the products in collaboration with local establishments or entrepreneurs can also be explored. Products exhibiting potential include typical indigenous dairy foods either not available in foreign countries or products whose authenticity may be questionable. Gulabjamuns, Burfi, Peda, Rasagollas, and a host of other Indian sweets have good business prospects.

- Products typically foreign to India but indigenous to other countries could also be developed for export. Such products can be manufactured in retail package sizes and could be produced from milk of sheep, goats and camel. Certain products are characteristically produced from milk of a particular species. For example, Feta cheese is used in significant tonnage, in Iran. Sheep milk is traditionally used for authentic Feta cheese. Accordingly, India's goat and sheep herds can be utilized for the manufacture of such authentic products.
k. Ingredient manufacture

Export markets for commodities like dry milk, condensed milk, ghee and certain cheese varieties are well established. These items are utilized as ingredients in foreign countries. These markets can be expanded to include value-added ingredients like aseptically packaged cheese sauce and dehydrated cheese powders.

**Cheese sauce:** Canned cheese sauce is made from real cheese to which milk, whey, modified food starch, vegetable oil, colorings and spices may be added. Cheese sauce is useful in kitchens for the preparation of omelet, sandwiches, entrees, and soups. In addition, cheese sauce is used as a topping on potatoes and vegetables and may be incorporated in pasta dishes.

**Cheese powders:** Cheese powders are formulated for dusting or smearing of popular snacks like potato chips, crackers, etc. They impart flavor and may be blended with spices.

With the globalization of food items, an opportunity should open up for food service and institutional markets.

1. Technology-driven manufacturing units

These plants would fulfil an essential need by providing a centralized and specialized facility for hire by the units which cannot justify capital investment but do need such services. Potential areas for state-of-the-art contract-pack units may conceivably specialize in cheese slicing, or dicing line, cheese packaging, butter printing, and aseptic packaged fluid products.

2. Training centers for continuing education

NRIs could set up technology transfer and updating centers for conducting seminars and workshops - catering to the needs of workers at all levels of the dairy industry. Here technical, marketing and management topics can be offered to ensure that the manpower continues to acquire the latest know-how of their respective fields.
The entrepreneurs need powerful tools to implement their plans. Appropriate investment and involvement by NRIs can serve as a catalyst for India's dairy food industry leading to exploration of business potential in domestic and export trade. Risk factors must be identified and managed by in-depth study of chosen areas so that chances of rewards are maximized under the current liberalization climate.

3.1.15 Regulatory Framework

The dairy industry was de-licensed in 1991 with a view to encourage private investment and flow of capital and new technology in the segment. Although de-licensing attracted a large number of players, concerns on issues like excess capacity, sale of contaminated/ substandard quality of milk etc induced the Government to promulgate the MMPO (Milk and Milk Products Order) in 1992. Milk and Milk Products Order (MMPO) regulates milk and milk products production in the country. The order requires no permission for units handling less than 10,000 litres of liquid milk per day or milk solids up to 500 tpa. MMPO prescribes State registration to plants producing between 10,000 to 75,000 litres of milk per day or manufacturing milk products containing between 500 to 3,750 tonnes of milk solids per year. Plants producing over 75,000 litres per day or more than 3,750 tonnes per year of milk solids have to be registered with the Central Government. The stringent regulations, government controls and licensing requirements for new capacities have restricted large Indian and MNC players from making significant investments in this product category. Most of the private sector players have restricted themselves to manufacture of value added milk products like baby food, dairy whiteners, condensed milk etc.

All the milk products except malted foods are covered in the category of industries for which foreign equity participation up to 51% is automatically allowed. Ice cream, which was earlier reserved for manufacturing in the small-scale sector, has now been de-reserved. As such, no license is required for setting up of large-scale production facilities for manufacture of ice cream.

Subsequent to de-canalization, exports of some milk based products are freely allowed provided these units comply with the compulsory inspection
requirements of concerned agencies like: National Dairy Development Board, Export Inspection Council etc. Bureau of Indian standards has prescribed the necessary standards for almost all milk-based products, which are to be adhered to by the industry.

3.2. THE CO-OPERATIVE MODEL

For decades, dairy players in India have been engaged in the liquid milk processing activity only. Backed by operation White Flood in 1970s, the milk industry in India witnessed the first wave of development in the milk production which gave India its status of the largest milk producer in the world. This was spearheaded by the ‘Co-operatives model’ which was supported by the GoI. Ownership being with the farmers instilled trust among the member milk producers in the cooperative model, which also ensured transparent returns. In addition, cooperatives also provided various services like cattle vaccination, cattle insurance, artificial insemination, installation of coolers at village level etc to improve productivity.

Further, there was minimal involvement of private players in the industry as approximately 80% of the retail price of the liquid milk went back to the farmers leading to low operating margins (4-5%). This was despite the consistent upsurge in the retail prices of the liquid milk. Consequently, the dairy companies were left with insufficient internal funds to plough back into the operations for adoption of modern technologies or development of milk variants. The above reasons coupled with factors such as evolving tastes and preferences, higher affordability, etc, lead to the entities venturing into the VADP segment for better profitability.

Product innovations are likely to accelerate India’s dairy market which is anticipated to improve industry margins by attaining greater scale, higher capacity use and an increasing contribution from new milk variants. Further, the development of processing and packaging technology along with improvement in retail and cold storage infrastructure has increased the shelf life of dairy products.
3.2.1 Amul's - The secret of success

Amul is an Indian dairy cooperative, based at Anand in the state of Gujarat, India. The word *amul* (अमूल) is derived from the Sanskrit word *amulya* (अमूल्य), meaning rare, valuable. The co-operative was initially referred to as *Anand Milk Federation Union Limited* hence the name AMUL. Formed in 1946, it is a brand managed by a co-operative body, the Gujarat Co-operative Milk Marketing Federation Ltd. (GCMMF), which today is jointly owned by 3 million milk producers in Gujarat. Amul spurred India’s White Revolution, which made the country the world's largest producer of milk and milk products. In the process Amul became the largest food brand in India and has ventured into markets overseas.

Dr. Verghese Kurien, founder-chairman of the GCMMF for more than 30 years (1973–2006), is credited with the success of Amul.

The system succeeded mainly because it provides an assured market at remunerative prices for producers' milk besides acting as a channel to market the production enhancement package. What's more, it does not disturb the agro-system of the farmers. It also enables the consumer an access to high quality milk and milk products. Contrary to the traditional system, when the profit of the business was cornered by the middlemen, the system ensured that the profit goes to the participants for their socio-economic upliftment and common good.

Looking back on the path traversed by Amul, the following features make it a pattern and model for emulation elsewhere. Amul has been able to:

- Produce an appropriate blend of the policy makers farmers board of management and the professionals: each group appreciating its roles and limitations
- Bring at the command of the rural milk producers the best of the technology and harness its fruit for betterment
- Provide a support system to the milk producers without disturbing their agro-economic systems
• Plough back the profits, by prudent use of men, material and machines, in the rural sector for the common good and betterment of the member producers and

• Even though, growing with time and on scale, it has remained with the smallest producer members. In that sense, Amul is an example par excellence, of an intervention for rural change.

Amul's success led to the creation of similar structures of milk producers in other districts of Gujarat. They drew on Amul's experience in project planning and execution. Thus the 'Anand Pattern' was followed not just in Kaira district but in Mehsana, Sabarkantha, Banaskantha, Baroda and Surat districts also. Even before the Dairy Board of India was born, farmers and their leaders carried out empirical tests of the hypotheses that explained Amul's success. In these districts, milk producers and their leaders experienced significant commonalities and found easy and effortless ways to adapt Amul's gameplan to their respective areas. This led to the Creation of the National Dairy Development Board with the clear mandate of replicating the 'Anand pattern' in other parts of the country. Initially the pattern was followed for the dairy sector but at a later stage oilseeds, fruit and vegetables, salt, and tree sectors also benefited from it's success.

3.2.2. DAIRY CO-OPERATIVES IN INDIA

National Cooperative Dairy Federation of India (NCDFI), based at Anand(Gujarat), is the apex organisation for the cooperative dairy sector. It's members include federal dairy cooperatives of states and union territories. Primary objective of NCDFI is to facilitate the working of dairy cooperatives through coordination, networking and advocacy. Important activities of NCDFI includes; coordinating sale of milk and milk products of its members to the Ministry of Defence and other para military organizations.

As a result of the perishable nature of milk and the range of skills involved in its production and marketing, dairying requires a number of services that can best be provided by cooperative action. It is not surprising therefore that the cooperative movement has featured prominently in the development of the dairy industry
worldwide. This paper reviews the role of producer cooperation in the dairy sectors of a number of countries in Asia.

**Rural producers' cooperatives**

The aim of a producers' cooperative is to provide services either free of charge or at a reasonable cost to its members. In addition, cooperative ownership emphasizes participation and control by member producers. Individual members can influence policy and management matters through registered membership bodies that are regulated by laws or rules of a community or state.

The cooperative principles as enunciated by the International Cooperative Alliance are voluntary and open membership; democratic control; limited interest on credit; equitable division of surplus; training of members; and cooperation among cooperatives. Cooperative organizations are aware of the importance of member involvement and, through training programmes, try to increase participation in the affairs of the society. The fact that each member has only one vote is particularly important; in the case of public companies, individual shareholders find it difficult to effectively control the management of a company unless they have a controlling interest through ownership of a large number of shares.

While farmers' cooperatives of various types play a useful role in promoting rural development, dairy cooperatives have special attributes that make them particularly suitable. Among these, they can facilitate the development of remote rural economies, thus upgrading the standard of living of the poor.

The main constraint that milk producers seek to overcome by acting collectively is the marketing of their product. The need to be assured of a secure market is a real one. It can be met by dairy farmers cooperatively establishing their own collection system and milk treatment facility in order to convert their perishable primary produce, which requires special and timely attention, into products with longer-keeping quality for marketing purposes.

Most dairy cooperatives adopt either a two- or three-tier system. One village or a group of two or three villages forms the basic unit of the primary cooperative. Only dairy farmers are allowed to enrol as members and they must
commit to supplying milk exclusively to the cooperative. While the day-to-day functioning of the cooperative is managed by full-time salaried employees, the committee or board of the cooperative, consisting of only elected members, makes the decisions on the affairs of the cooperative. Primary-level cooperatives bring together members with similar interests at village level to work towards common goals. This system can also identify good leadership talent that would be given a chance to develop through interaction with other community leaders.

A group of primary-level cooperatives forms a union, which can be for a district, region or milkshed area. This is the second tier. The third tier is the unions joining up to form a federation at state or national level, depending on the size and system of administration in the country. The federation has the power to act on such issues as pricing policies, extension, training, control of milk and milk product imports, subsidies and credit.

3.3. DAIRY DEVELOPMENT DEPARTMENT IN TAMILNADU

The Dairy Development Department was established in 1958 in Tamilnadu. The administrative and statutory control over all the milk cooperatives in the State were transferred to the Dairy Development Department on 1.8.1965. The Commissioner for Milk Production and Dairy Development was made as the functional Registrar under the Tamilnadu Cooperative Societies Act. With the adoption of 'Anand pattern' in the State of Tamilnadu, Tamilnadu Co-operative Milk Producers' Federation Limited was registered in the State on 1st February 1981. The commercial activities of the Department such as Milk Procurement, Processing, Chilling, packing and sale of milk to the consumers etc., hitherto dealt with by the Tamilnadu Dairy Development Corporation Ltd., were transferred to the newly registered Tamilnadu Co-operative Milk Producers' Federation Limited, popularly known as "Aavin".

In the wake of liberalization policy, private dairies have also entered into the field of dairying. As per the directions of the Hon'ble Chief Minister of Tamilnadu high priority has been given for improving the performance of milk Co-operatives by adopting a systematic approach and proper strategy in Milk Co-operatives. Significant achievement has been made by Milk Producers' Cooperative
Societies, Unions and Federation in the State of Tamilnadu. The cattle population in India is approximately 15% of total cattle population in the world. India stood no. 1 position in milk production. Tamilnadu is one of the leading state in milk production. The milk production in Tamilnadu per day is 145.88 Lakh litres.

3.3.1. OBJECTIVES OF THE DAIRY DEVELOPMENT DEPARTMENT

1. Assure a remunerative price for the milk produced by the member of the Milk Producers' Co-operative Societies through a stable, steady and well organized market support.

2. Distribution of quality milk and milk products to the consumers at reasonable price.

Keeping these objectives in mind, a number of activities are undertaken by the Dairy Development Department, viz., Provision of free veterinary health cover to all animals owned by the members of milk cooperatives, implementation of Artificial Insemination Programme, supply of balanced cattle feed and inculcation of farmers with the modern animal husbandry methods and practices.

All activities, which are essential for the upgradation of the milch animals and improving their productivity in the long run, have been undertaken. Provision of necessary infrastructure facilities for marketing milk and milk products and supply of quality milk to the consumer has been made by way of establishing new chilling centres, pasteurization plants and adoption of modern processing system.

3.3.2 DEPARTMENTAL SET UP

The Commissioner for Milk Production and Dairy Development is the Head of the Dairy Development Department. He is the functional registrar in respect of Dairy Co-operatives in the State. He is also the Ex-officio Managing Director of the Tamilnadu Cooperative Milk Producers’ Federation Limited. i.e. Aavin.

The Commissioner for Milk Production and Dairy Development exercises all the statutory powers with regard to the registration of societies, supervision, inspection, inquiry, disputes, liquidation of milk cooperatives including the District Cooperative Milk Producers' Unions and Federation under the relevant provisions of
the Tamilnadu Cooperative Societies Act, 1983 and Tamilnadu Cooperative Societies Rules, 1988. While discharging the statutory functions, the Commissioner for Milk Production and Dairy Development is assisted by the Deputy Milk Commissioner (Co-operation) in the rank of Joint Registrar of Cooperative Societies and a Deputy Registrar at the Headquarters besides 23 Deputy Registrars (Dairying) at the District level by way of conferring the powers of the functional Registrar.

3.3.3 FUNCTIONS OF THE DAIRY DEVELOPMENT DEPARTMENT

The main functions of the Dairy Development Department include Organisation of societies, registration of societies, supervision and control of primary milk cooperatives, District Cooperative Milk Producers Unions and Tamilnadu Cooperative Milk Producers Federation.

The Dairy Development Department exercises statutory function - like Inquiry, Inspection, Surcharge and Super session, appointment of special officers, liquidation and winding up of dormant Societies etc. The Commissioner for Milk Production and Dairy Development, Deputy Milk Commissioner (Co-operation), and Circle Deputy Registrars (Dairying) are vested with quasi-Judicial powers in respect of settlement of disputes, appeal, revision and review under various provisions of Tamilnadu Cooperative Societies Act, 1983 & the Tamilnadu Cooperative societies Rules, 1988 made there under.

The Commissioner for Milk Production and Dairy Development has been designated as the State Registering Authority for the state of Tamilnadu, under the provisions of Milk and Milk Products Order'92. All the Dairy units including private Dairies handling more than 10,000 lpd of milk or Milk Products containing milk solids in excess of 500 Metric tones per annum have to obtain registration certificate under the provision of Milk and Milk Products Order'92. The Commissioner for Milk Production and Dairy Development / State Registering Authority has been conferred with powers to register the dairy units having handling capacity from 10,000 lpd to 2,00,000 lpd. The Commissioner / State Registering Authority, Deputy Milk Commissioner (Co-operation) / District collectors and Deputy Registrars (Dairying) have been authorized to carry out supervision and periodic inspection of the dairies.
3.3.4 PRIMARY DAIRY COOPERATIVES MILK SOCIETIES

A minimum of 25 or more individuals competent to contract under section 11 of the Indian Contract Act of 1872, owning milch animals, can form a Primary Dairy Cooperative Society, with one or more villages as its area of operation. Such persons have to approach the Circle Deputy Registrar's (Dairying) office functioning at the District for further guidance. The members of Primary Cooperative milk society have to supply milk to the Society which will procure milk on quality basis and they will receive milk cost once in 10 days / 15 days from the Society. Milch animals are provided with free veterinary health cover, artificial insemination and the supply of balanced cattle feed. Inductions of farmers on modern animal husbandry practices are aimed at by upgrading the milch animals and thereby improving their productivity in the long run for the benefit of the members.

3.3.5 WOMEN MILK PRODUCERS’ COOPERATIVE SOCIETIES

In order to encourage the women members to contribute more to the dairy sector, they are being called upon to organise women milk producers’ cooperative societies in their respective areas. There are 1210 women milk Producers’ cooperative societies functioning in Tamilnadu.

Primary Milk Cooperative Societies and District cooperative Milk Producers Unions and Federation were previously administered by elected Boards. As the terms of office of the members of elected Board already expired and as they were continuing only on extended term of office as per section 33(10)(aa) of Tamilnadu Cooperative Societies Act, 1983, the Government issued orders terminating the extended term of office of members of Boards of these societies and the Special Officers have been appointed under section 89(1) of Tamilnadu Cooperative Societies Act, 1983. All the primary Milk Cooperative Societies are now functioning under the Control of Special Officers since 26.5.2001. In respect of District Cooperative Milk Producers Unions, the Collectors of respective Districts have been appointed as Special Officers and for Tamilnadu Cooperative Milk Producers Federation Ltd., the Managing Director of the Federation has been appointed as Special Officer. Consequent on the bifurcation of the Dharmapuri District and creation of new District namely Krishnagiri, the District Collector of Krishnagiri has
been appointed as Special Officer of Dharmapuri District Cooperative Milk Producers’ Unions Ltd., with effect from 27.2.2004.

3.3.6 FUNCTIONS OF DISTRICT COOPERATIVE MILK PRODUCERS UNIONS

There are 17 District Cooperative Milk Producers' Unions functioning in the State of Tamilnadu covering 30 Districts. There are 15 Dairies in District Co-operative Milk Producers' Unions with an installed processing capacity of 19.42 lpd. There are 36 Chilling Centres (Functional) in District Co-operative Milk Producers' Unions with installed chilling capacities.

3.3.7 MILK PROCUREMENT BY DCMPUs: PRICE REVISION

Most of the rural people especially women make their livelihood by rearing milch animals and by supplying milk to the Co-operatives. Keeping this in view and to improve the rural economy and to enhance the personal income of the stakeholders in rural area, Government of Tamilnadu directed the Tamilnadu Co-operative Milk Producers’ Federation and District Co-operative Milk Producers’ Union to raise the procurement price of the cow's milk from Rs.18.00 to Rs.20.00 per litre and that of the buffalo’s milk from Rs.26.00 to Rs.28.00 with effect from 18.11.2011 and the milk cost as per the revised procurement price is being disbursed to the Milk producers.

Average milk procurement in DCMPUs in lakh litres per day.

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<thead>
<tr>
<th>Year</th>
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<tr>
<td>Year 2012-2013</td>
<td>26.83</td>
</tr>
</tbody>
</table>
3.3.8. FUNCTIONS OF DISTRICT CO-OPERATIVES

1. Establishment of chilling centers.
2. Formation of new milk routes to collect milk produced by the members of the societies.
4. Supply of quality milk under hygienic conditions.
5. Fixation of procurement and selling price of Milk.
6. Increase of liquid milk sales by introducing innovative sales promotional activities.
7. Supply of inputs to the members of the societies.
8. Render Veterinary Health Service and emergency service to the cattle of members of primaries, to impart training on First aid and on Artificial insemination to the staff of member societies.
9. Render Veterinary Health Service and emergency service to the cattle of members of primaries, to impart training on First aid and on Artificial insemination to the staff of member societies.
10. Extending Artificial insemination services to the cattle owned by the members of Milk Societies.
11. Providing milk cans, Milk 'O' testers and LN2 containers.
12. Salem, Erode, Madurai and Dharmapuri Unions are the Feeder Balancing Dairies. Surplus milk in the District Unions, after meeting their local sales is diverted to the nearest Feeder Balancing Dairies for conversion into milk products, such as Skim Milk Powder, Butter etc.
13. The three Cattle Feed Plants at Madhavaram, Erode and Kappalur are run by the Kancheepuram - Tiruvalthur Union, Erode Union, Madurai Union respectively. The production capacity of these cattle feed plants is 100 MT per day each. The balanced cattle feed produced in the form of pellets and mash are supplied to the members of the Milk Co-operatives, livestock farms manned by the Animal Husbandry Department and to various local bodies including the Corporation of Chennai.
3.3.9 PROGRAM AND SCHEMES BY THE GOVERNMENT

(a) SUPPORT TO TRAINING AND EMPLOYMENT PROGRAMME FOR WOMEN (STEP)

To improve the socio economic conditions of poor rural women belongs to SC/ST, asset less women and Self-Help-Group, the Government of India sponsored "STEP" Scheme at a total cost of Rs.649.464 lakh, with 90% Government of India share of Rs.584.518 Lakhs and the balance 10% share of Rs.64.946 Lakhs to be met by the implementing Agency. The period of the scheme is 3 years from 2002 to 2005 and further extended to March 2008, with an objective to identify Self-Help-Group women who are interested in Dairy Sector, for organizing exclusive Women Dairy Cooperative societies and to provide Training and employment opportunities by arranging milch animals loans and to collect milk from them.

This Scheme is implemented in 7 District Cooperative Milk Producers' Unions viz. Salem, Erode, Dharmapuri, Vellore, Villupuram, Coimbatore and Trichy comprising of 13 Revenue Districts. Through this scheme 145 Women Dairy Cooperative Societies were organized. These societies were provided with animal health cover, Artificial Insemination cover supply of balanced Cattle Feed, fodder production, vaccination programme, Managerial subsidy, milk chilling cost, milk commission and margin money to the members for the purchase of milch animals. At the end of the scheme 10000 women would have been trained on the principles of Cooperative law, Artificial insemination and First-aid to Cattle, Farmers induction programme, Dairy Animal Management, use of milk testing equipments, defection of adulteration in milk etc., In addition to this, the Women Dairy Cooperative Societies are provided with infrastructure facilities.

The Federation and District Coop. Milk Producers; Union ensure market for all the milk produced by the beneficiaries under this scheme through out the year at remunerative price in order to make the project viable. The targeted 145 Women Dairy Cooperative Societies have been organized and enrolled 10150 women members. The average milk procurement from STEP societies are 26283 litres per day with an average income of Rs.60/- per day per beneficiary.
With the implementation of STEP scheme the average income of beneficiary will be enhanced from Rs.7000/- per year to rs.20000/- per year at the end of this project.

(b) INTENSIVE DAIRY DEVELOPMENT PROGRAMME

Government of India have accorded sanction for Rs.312.15 lakhs to Sivagangai District Cooperative Milk Producers’ Union as full grant to implement ‘Intensive Dairy Development Programme’ in Sivagangai and Ramanathapuram Districts. First year grant of Rs.55.45 Lakh was received and utilized. Second year (2006-2007) grant of Rs.102.14 Lakh has been received and being utilised by the union.

Under this programme, funds have been sanctioned to unions to improve milk procurement, milk sales, creation of infrastructure required for milk processing and marketing, extension of input activities, manpower development in districts for a period of five years.

During the year 2006-2007, GOI accorded administrative approval for the implementation of ‘Intensive Dairy Development Programme’ in Tirunelveli and Kanyakumari DCMPUs for a total outlay of Rs.554.06 Lakhs and Rs.291.77 Lakhs respectively. Tirunelveli, Thoothukudi and Kanyakumari Districts will be benefited under this scheme.

The first year grant of Rs.49.83 Lakh was received and being utilised by Kanyakumari union. The first year grant of Rs.204.50 Lakh for Tirunelveli union is in the process of release.

Besides, a proposal for Rs.899.875 Lakh has also been sent to Govt. of India to avail financial assistance to improve dairy development activities in Thanjavur milk union.

(c) STRENGTHENING INFRASTRUCTURE FOR QUALITY AND CLEAN MILK PRODUCTION

Government of India sponsored a scheme called ‘Strengthening Infrastructure for Quality and Clean Milk Production’ to strengthen infrastructure facilities and to ensure Clean milk production at village level. The period of the scheme is two / three years.
Objective of the scheme is to train farmers on clean milk production activities, to provide chemicals and utensils to pouring members, to strengthen district union dairies / chilling centres laboratory and to install bulk milk coolers at societies to improve initial quality of milk.

Government of India will release the entire amount as full grant for training, provision of antiseptic solutions, supply of stainless steel utensils and modernization of Quality Control Labs at Dairies / Chilling Centres. Government of India will release 75 percent as grant for installation of bulk milk coolers and the remaining 25 percent will be met by the concerned beneficiary District Unions.

Government of India so far has sanctioned Rs.1224.21 lakhs to Vellore, Villupuram, Trichy, Dharmapuri, Salem Kancheepuram-Tiruvallur, Erode, Nilgiris and Madurai milk Unions for the implementation of the scheme. Under these schemes, 48001 members will be benefited, 90 Bulk Milk Coolers will be installed and the chilling capacity will be increased by another 3.71 lakhs LPD.

3.4 DAIRY DEVELOPMENT IN SALEM DISTRICT

3.4.1 INTRODUCTION ABOUT SALEM DISTRICT

Salem is a city of Tamil Nadu state in southern India. Salem located in the north central part of the southernmost state of India and also fifth-largest city of Tamil Nadu, area of over 5,205 sq km. Salem city is known for its mangoes, steel and Mettur dam, which is a major source of irrigation and drinking water for the state of Tamil Nadu. Salem is a Geologist paradise, surrounded by hills and the landscape dotted with hillocks. Yercard is one of important tourist place in Salem.

Salem got its name from the San skrit word ‘Sailam’ which means mountain. As this area is surrounded by hills, it is apt to be called Salem. Local folklore believes Salem to be the birthplace of the Tamil poetess Avvaiyar. It is a land of minerals. The hills around Salem have iron ore, bauxite, limestone, precious stones etc. Salem is the fifth largest city of Tamilnadu. This district was later divided into three: Dharmapuri, Namakkal and Salem. Another specialties:

S - for steel,
A - for aluminum,
L - for Limestone,
E - for electricity

(There is hydro – electric power generation in Mettur) and

M - for mango (Salem mangoes are famous).

Yercaud, a beautiful hill station, is located here. Since Salem is a city with infrastructures well developed, tourists can stay in this place and visit the places in the neighboring districts of Namakkal and Dharmapuri.

**The Salem Steel Plant**

This was an ambitious project started with a view to utilise the locally available iron ore – from Kanchamalai to produce steel. Now it is a public sector company engaged in rolling outcast steels blocks into sheets of required dimensions by cold and hot extrusion methods.

**Mineral deposits**

The district is rich in Mineral deposits like Magnasite, bauxite, granite, limestone, quartz, and iron ore. Allied industries like magnasite mining, cement manufacture, refractory bricks manufacture, aluminium smelting etc. thrive well.

**Mettur Dam**

Mettur about 30 km from Salem is connected by rail. Buses also ply from Salem to Mettur. Mettur dam is one of the largest of its kind in the world. It is constructed in a gorge where the river Cauvery enters the plains. It was completed in 1934. Its height is 65 metre, length 1616 metre, area 15,540 hectare and capacity 2648 cubic metre. This is a hydro-electric power station producing 240 mega watt powers. Water is stored here during floods and rains and let out for irrigating to the deltaic regions of the Cauvery. There are a number of factories here like soaps and detergent manufacturing factories, galvanizing plants, Vanaspathi units etc. and with permit, visitors could see them. With permit, visitors could also enter the tunnel of the dam and also witness the hydro electric power station. The dam, the park, the major Hydro Electric power stations and hills on all sides make Mettur a good tourist attraction.
Agricultural produces

Many agricultural products from Salem have a wide spread market throughout the country. Mango fruits from Salem are enjoyed and much sought after, specially the variety Malgova, which is the pride of Salem, besides a number of other newly introduced hybrid varieties. Tapioca, locally known as Maravalli or kuchi kilangu is extensively cultivated by the farmers of Salem. Salem holds a monopoly in tapioca production. The tubers are used primarily to produce starch. A variety of food items like chips, fryums, papads, noodles and vermicelli are also produced from tapioca. Tapioca and castor research centre functioning in Salem is engaged in research and development activates to produce high yielding and disease resistance varieties.

Sago Serve the largest co-operative society in Asia dealing in a single commodity, is located in Salem, run by the Government to provide a competitive market for the farmers gain a broader profit margin without hassle of the middle men

Animal husbandry

The sheep research station located at Mecheri in Mettur, developed and produced the popular Mecheri breed. This breed is popular among the farmers and is mainly reared for meat purposes.

Dairy

Salem Dairy has an impressive milk production and the district stands first in the production. A variety of milk products have been introduced by the dairy recently and are effectively marketed.

Tourism

Salem is famous for its tourism attraction – Yercaud a summer hill resort. Its quite inexpensive yet exquisitely picturesque. The cool and milk climate prevailing here makes it an ideal summer retreat.

The shervarayan cave temple with a rivulet behind the idols is one the main spots of the tourists. Yercaud is also a good place or spices like coffee, cardamom, pepper, fruits like butter fruit, orange and butter fruit.
Apart for these Salem is famous for forts and monuments. Omalur and Sankagiri there are impressive forts with its elaborate and massive ramparts running all the way up the hill. These forts were said to have been the holding of King Tipu Sultan and “Theeran Chinnamalai” – a warrior who fought against British.

**Population**

The population details of Salem are given below:

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**Animal Husbandry**

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**3.4.2 THE SALEM DISTRICT CO-OP MILK PRODCUERS’ UNION LTD. – AAVIN**

The prestigious Salem Dairy complex is situated in about in 46 acres of land bound by Sithanur and Dhalavaipatty villages. It is located just 6 km away from Salem railway Junction on the way to Govt. Medical College and Salem Steel Plant. The Salem District Co-op. Milk Producers’ Union Ltd., has been registered on 10.07.1978 and started functioning from 07-10-1978. To begin with, the union started procuring 33,100 LPD of milk from 227 affiliated primary milk coop societies. Then gradually expanded its activities and now reached a daily average procurement of more than 4.0 lakh liters per day from 1049 functional DCS.

It is a Feeder Balancing Dairy i.e converting surplus milk solids into products like butter, ghee and Skim milk powder. The commercial production of products viz. Butter, Ghee and Skim Milk Powder started on 16-08-1983. All the Union activities are fully computerized. This union is specially featured with:
1. Training Centre
2. Progeny Testing Scheme
3. Clean Milk Production at farmer level
4. Aseptic packaging Station
5. Milk Powder plant
7. Export
8. Quality policy.

Salem aavin is committed “to supply milk and milk products to meet needs and satisfaction of customers by adopting best standards in a hygienic and safe environment with continual Improvement of Quality with Motivation, commitment and training of employees”.

**Animal Breeding**

In Salem milk union, 591 artificial insemination centres are functioning in cluster manner covering all the DCS for AI activities. Frozen semen is purchased from Nucleus Jersey Stud Farm ,TCMPF Ltd; Ooty and BFSS ,TCMPF Ltd ,Erode for cattle and buffalo respectively at the rate of Rs 10 per dose. Artificial insemination facility has been extended at the doorstep of farmers and thereby the conception rate is improved. They have computerised the artificial insemination activities. Based on the report generation, the artificial insemination performance is monitored to improve the breeding efficiency.

**Animal Health**

As a part of the animal health management , 16 numbers of regular veterinary units (fortnight route) and emergency units ( round the clock) are functioning to cater to the needs of the health coverage to all the milch animals of DCS members. Infertility camps at the society level abd the breeding problems in the animals are treated here. As a preventive measure , the animals are vaccinated against FMD to protect the animals and milk loss.

**FODDER**

Nearly 200metric tonnes of cattle feed per month from cattle feed plant Erode are supplied to the DCS .To meet out the green fodder requirement of the
milch animals our milk union is supplying the fodder by way of cultivating the Co3 fodder /Slips for distribution to the farmers throughout the year. Apart from the union land, farmer’s land also being used for fodder cultivation and propagation and totally 2700 acres of land has been brought under the fodder cultivation. Farmers are educated on ration balancing programme to improve the feed conversion ratio in the animals. For dry fodder management urea treatment of paddy straw is carried out to preserve the same during the surplus season.

3.5 VALUE CHAIN IN AAVIN

In Salem Milk production is dominated by small and marginal landholding farmers and also by landless laborers who in aggregate own 70% of the milch animal herd. And as the crop production on 78% of the agricultural land still depends on rain, which is prone to both drought and floods, rendering agricultural income is very much uncertain for most of the farmers. Dairying, as a subsidiary source of income and occupation, is real relief to most of the farmers in the society. Usually one or two milch animals enable the farmers to generate sufficient income to break the vicious subsistence agricultural-debt cycle. The Operation Flood which is the successful Indian dairy development programmed has analyzed that how food aid can be utilized as an investment in building the type of institutional infrastructure that can bring about national dairy development. Programmes like this, with similar policy orientations, may prove to be appropriate to dairy development in the early 1950’s was commercially importing around 55000 tons of milk powder annually to meet the urban milk demand. Most of the significant developments in dairying have taken place in this century only.

Logistics has become one of the most important activity of all companies where has been treated as a strategic function to gain competitive advantage over a company’s competitors. Agribusiness as any other business is also using logistics tools in their supply chain to reduce the chain cost and more to improve their business efficiency as a whole. Transportation is one of the logistics activities that influence price of the product which in some cases can represent 25% of the final price. Milk collection of a dairy business plays an important role in the overall performance of the company. A poor milk collection will jeopardize the entire chain
as it is the first stage of the manufacturing process. The cost of milk has two components: first, the cost of transport, and second, the cost of paying the farmer for the milk. Given that the dairy has little scope for allowing the total cost to increase, then any increase in the price per litre paid to the farmer must be compensated by reduction in the cost per litre of collecting the milk. An efficient transport operation can allow a higher milk price to farmers, in turn attracting higher volumes that can lead to further economies of scale in milk collection. Because a reduction in transport cost can improve the price per litre that a dairy can offer its farmers, dairy companies have consistently attempted to adopt cost reducing initiatives. These have included introducing larger capacity collection vehicles and longer working days for the drivers. In dairies, schedulers control milk collection. The major challenge for the dairy sector is undoubtedly to raise milk production to meet the increasing demand that arises from the almost inevitable expansion of population and presumably growth of income. To meet this challenge, policies should be framed in such a way that they are less cost oriented. Adoption of appropriate technologies for production, procurement, processing and transportation are equally important aspects of dairy development. The main reasons for developing dairies are to supply milk at the lowest possible price to consumers and to provide a viable subsidiary occupation to the unemployed rural poor so as to raise their earning capacities.

A Value Chain is an integrated manufacturing process wherein raw materials are converted into final products, then delivered to customers. At its highest level, it is comprised of two basic, integrated processes: The production planning and inventory control process, Distribution and logistics process.

The production planning and inventory control process encompasses the manufacturing and storage processes, and their interface(s). More specifically, production planning describes the design and the management of the entire manufacturing process.

Inventory control describes the design and the management of the storage policies and procedures for raw materials, work-in-process inventories, and usually final products.
The distribution and logistics process determines how products are retrieved and transported from the warehouse to the retailers. These products may be transported to retailers directly, and may first be moved to distribution facilities, which, in turn, transport products to retailers. This process includes the management of inventory retrieval, transportation, and final product delivery. These processes interact with one another to produce an integrated supply chain.

The design and management of these processes determine the extent to which the value chain meets the requirements.

Value chain management has been considered as a major component of competitive strategy to enhance organizational productivity and profitability. In recent years, organizational performance measurement and metrics have received much attention from practitioners.

Aavin Value Chain Performance can be measured by the metrics and measures of milk supply chain.

1. Plan
2. Source
3. Make/assemble
4. Delivery/customer

3.5.1 Order Planning

a) The order entry method: The order is taken for one month in advance from the customers and the specification of each and every order is determined. The same is converted into valuable information for a speedy planning process.

b) Order lead-time: Aavin takes minimum lead time for the order cycle. Information serves as a very important tool to minimize the lead time. It consumes only three days to fulfill the future orders.

c) The customer order path: Aavin searches and finds out all the possible non-value-adding activities and takes necessary steps to eliminate all the non-value-adding activities and thus it remains as a responsive supply chain by managing the distance and cost as well.
Aavin ignored various criteria like reliability, quality checks and the selections were mainly based on price competition.

3.5.2 Evaluation of Suppliers

Suppliers were evaluated at the strategic, operational and tactical level in the scale of efficiency, flow of material and information, responsiveness and customer satisfaction.

(i) Strategic Level Measures: Aavin has reduced its lead time drastically. Various measures have been taken to maintain the quality level. Initially suppliers were given importance based on the price variations and right now it is based on criteria like stringent quality checks, on time delivery and reliability.

(ii) Tactical Level Measures: Aavin takes less purchase order cycle time which is linked to the order entry thereby creating a good cash flow throughout the year. It focuses on stringent quality assurance methodology and they have not increased their capacity overall.

(iii) Operational Level Measures: Aavin has a difficulty in enabling the distributors / dealers adhered to a developed schedule. Customers as well as the dealers face difficulty in getting defect free deliveries. Suppliers strongly believed there is a collaborative relationship among them and Aavin and co-operation on a specific project. Each and every time the supplier performance and relationship are evaluated.

3.5.3 Production planning

a) Range of products and services

Aavin has a plant that manufactures a broad range and categories of product that facilitates them to come out with the introduction of new products and a longer life cycle.

b) Capacity utilization

Since it’s been a long time, the capacity of Aavin has not increased in few branches. They want to provide speedy response to customer demands and ensure maximum flexibility and less lead-time but since there is less capacity utilization, it becomes tedious for Aavin to achieve speedy response and maximum flexibility.
c) Effectiveness of scheduling techniques:

Aavin keeps in pace the scheduling according to the demands placed by the customers. Aavin tries to implement good scheduling but due to uncertain events like accidents, lorry strikes results in ineffective scheduling.

3.5.4 Evaluation of delivery link:

 Especially milk supply chain doesn’t have a long time to deliver the products to the customer; the milk supply chain must be capable of having a superior delivery link to minimize the time taken to deliver the product.

(a) Measures for delivery performance evaluation:

Delivery performance evaluation will be done by taking a combination of delivery reliability and order completeness. The truck operators of Aavin are ordered to deliver the products without any damages and they are instructed to complete all the orders on the same trip as far as possible. Various problems like unnecessary high inventory of milk won’t be tied up to the capital and as a result, the number of go-downs required for storing milk is minimized. Aavin always makes necessary arrangements to see the delivery date, time and conditions of how the goods were received. Keeping this invoice as a document they determine whether perfect delivery has happened (or) not. But once the nature of the delivery is determined, discrepancies are not sorted out.

(b) Flexibility of The Delivery System

Aavin doesn’t have a very flexible delivery system towards fulfilling the customer needs. Aavin never request customers (dealers) to specify the agreed place and mode of delivery to deliver the milk, and they don’t pay attention to customized packaging. Total distribution cost Aavin invests huge amount of time in determining the tradeoff between the delivery routes and the cost associated with it. Apart from determining the trade-off, it considers each and every individual cost elements together with their impact on customer service which encourages trade-off that leads to a more effective and efficient distribution system.

3.5.5 Measuring Customer Service and Customer Satisfaction:

A happy and satisfied customer is an utmost importance to each and every class organization. In a world of globalization, the customers of a particular
company may either reside next door (or) across the globe. While measuring supply chain performance, it must focus on customer satisfaction.

a. Flexibility

Aavin must have higher flexibility in introducing new products. They have to provide speedy response to customer demands and as a result less flexibility in taking customer order prevails.

b. Customer query time

Aavin always makes considerable efforts to see whether goods are received in good condition. But customers feel that whenever they place some query it takes lot of time to be answered.

C. Post transaction measures of customer service Post transaction activities play an important role in customer service and provide valuable feedback.

Supply chain and logistics cost Supply chain should be designed in such a way to reflect the performance at each and every stage. The efficiency is determined based on the financial measures.

a. Cost associated with assets and return on investment Aavin has a high supply chain asset which includes more cost associated with plant, high accounts receivable and more on equipments and less on Procuring milk. On the other hand the cost associated with pilferage, deterioration and damage is very high. Information processing cost Aavin has invested a considerable amount of money in information processing to provide timely, accurate and reliable information and to lead greater integration of modern supply chain.

The value chain performance of the Aavin milk supply chain can be evaluated based on various criteria like supplier delivery performance, order planning, supply link, customer service and customer satisfaction and post transaction. The present study concentrates on the risks and uncertainties faced and its impact on the value chain activities of AAVIN.