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CHAPTER- II

HISTORY AND GROWTH OF DAIRY INDUSTRY

2.1 Introduction

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2.1 INTRODUCTION:

In this chapter an attempt has been made to trace the historical development of dairy industry in the world, India, Maharashtra, Satara District. It also includes the operation flood programme.

2.2 DAIRY FARMING IN WORLD:

The dairy industry is based on the ability of mammals to produce milk in excess of that required to nourish their young. The excess milk which has a high nutritional value, is used for human consumption. Cattle are the primary producers of milk in the World, producing about 91 percent of the world's supply. In some countries cows sheep, goats and she-buffaloes are the principal producers of milk. The camel and reindeer are also used for milk production. Over the centuries, cows and some other mammals have been bred and selected for their ability to produce large quantity of milk.

Value of Milk in Human Nutrition:

Milk, described as nature's most perfect food, is the sole source of food for new born mammals. For the human infant, milk is the only source of nutrients for the first several months of life and in many countries milk plays a major role in the diet of the growing child. Milk and milk substitutes are important during the early growth of the most domesticated mammals as well. In addition, milk can be a valuable source of nutrients for mature humans, especially the elderly ones. Milk and milk products play

an important role in maintaining good health of the people.

History of the Dairy Industry:

The domestication of cattle and the use of their milk for human food began somewhere in Asia or northeast Africa between 6000 and 8000 B.C. Before the cow was domesticated, it was probably hunted by primitive man. Over the years, the cow has been used as a beast burden and has been a source of food, an object of worship, a source of sacrificial offering and a subject of mythology. Milk of cow and its products have been used for food, sacrificial offerings, cosmetics and medicants.

The oldest written records are believed to go back to the Sumerians of Mesopotamia in approximately 6000 B.C. Dairing was highly developed at that time.

The people of India were raisers of cattle as early as 2000 B.C. Butter was used as a food and as a holy offering to the gods. The butter was changed to ghee (butter oil or clarified butter). The cow at that time was considered holy.

The major develcpments in the dairy industry from the beginning of the Christian Era to the middle 1850's occured in Europe. Most of the currently important dairy cattle breeds in the United States and Europe originated in Europe.[1]

Milk Production and Per Capita Consumption in World:

There are more than 3.8 billion head of livestock in the world. Although 65 percent of the livestock are in developing

countries, these countries produce only 17 percent of the World's milk. Dairy cattle are most prevalent in the cooler and relatively humid regions of the temperate zones. About 80 percent of the world's milk is produced in North America, Europe, the USSR, Oceania and South Afirca. The milk production and the milk available per capita by regions of the world is shown in Table 2.1

TABLE NC. 2.1

Population, Milk Production and Per Capita Milk Consumption By Regions in the World :

Region	Population 1980 (Millions)	Projected Annual Growth rate 1981-1983 (Percent)	Milk Produced 1979-1981 (MM T)	Per Capita consumption 1978-1980 (kg)
North Africa, Middle East	246	2.5	16.3	92.8
Sub-Saharan Africa	369	3.2	9.7	27.8
EEC	254	0.3	113.7	386.6
Other Western European Countries	77	0.6	23.3	278.7
USSR	262	0.9	92.9	363.7
Eastern Europe	131	0.6	44.8	337.6
South Asia	869	2.2	42.5	48.7
East Asia	448	1.7	7.3	19.9
Asia Centrally Planned	1069	1.4	7.9	7.2
Oceania	31	1.2	12.2	290.4
Latin America	354	2.?	34.1	102.0

Region	Population 1980 (Millions)	Projected Annual Growth Rate 1981-1983 (Percent)	Milk Produced 1979-1981 (MM T)	Per Capita consumption 1978-1980 (kg)
North America	246	0.7	66.1	263.0
World Total :	4356	-	470.8	107.1

Source : Principles of Dairy Science by G. H. Schmidt, L.A. Van Vleck, M.F. Hutjens, P. 5

From the above table we can say that many Asian and African countries have a very small amount of milk available per capita. Some countries, notably Ireland, Denmark and New Zealand, have high per capita milk production but per capita consumption of milk is considerably below production because these countries export the milk to other countries. The European Economic Community and New Zealand are responsible for about 80 percent of the World's exports.

In developing countries the projected growth rate in human population is very high; hence the per capita availability and consumption of milk are low. Another problem is that, most of the developing agricultural countries are located in the tropical or sub-tropical regions of the World, in which climatic and feed conditions are not as favourable for animal production as those in temperate regions.

2.3 DAIRY FARMING IN INDIA:

Importance / Needs:

India is predominantly an agrian economy with more than 75 percent of its population living in villages and depending on agriculture and allied activities for their livelihood. Land and cattle have traditionally been the two basic income yielding assets of Indian Farmers. More than 70 percent of the rural households possess a mere 21.8 percent of land holding. They, however, own as much as 64.8 percent of total milch animals. In terms of actual number, the poor, marginal farmers and landless labourers from the largest group of tural milk producers.[2] Thus, dairying occupies a significant place in the agrian economy of the country like India. It meets the requirements of food, creates employment and generates income.

The importance of dairy in Indian economy was highlighted by M.S. Randhawa while addressing XII Annual Dairy Industry Conference, 1976, hled at Ludhiana as -

" Dairy animals, comprising of cows and buffaloes, are the major livestock and hold a very important place in the national economy. Apart from their role in milk production, they contribute a huge quantity of organic manure, which is one of the major inputs in our agriculture. Dairy farming is also very important subsidiary occupation. It provides employment to millions of unemployed and under employed and particularly to small farmers, marginal farmers and landless labourers in villages. In view of these benefits and the facts that dairy animals being ruminants, can utilize rough ages, dairy farming

should complement and supplement the production of food and fibre in the country and not compete with it.[3]

The National Commission on Agriculture has also emphasised the need for cultivators of the small and marginal farms, as also landless agriculture labour, taking to milk production for employment income. On small farms of 1.7 hectares, it was estimated that the introduction of dairy enterprises could increase the farm income from Rs. 5,692 to Rs. 12,275 and the employment level from 4,412 man hours to 4,916 man hours per annum; on marginal farms also a similar trend was noticed with respect to increase in income and employment. The introduction of dairy enterprise increased the income of a small farm of 2.49 hectares by 67 percent, of a medium farm of 5.02 hectares by 32 percent, of a large farm of 10.87 hectares by 41 percent. Similarly, the employment for the respective categories of the farms increased by 22,26 & 37 percent.[4]

Dairy industry can make a significant contribution to National Income. Milk and Milk products constitute about 2/3 of the livestock products was estimated at 25 million in 1976-77, which was 6 percent of the net national product at factor cost.[5]

The importance of the dairy industry can also be measured by the share of milk and milk products in the total consumption expenditure on food. In 1983, average per capita consumption expenditure on milk and milk products was about 7.5 percent in rural areas and 9.2 percent in urban areas of the country.[6]

Now in the days to come the demand for milk and milk products will grow steadily and rapidly with the industrialisation, growth of cities and increase in population and per capita income. In view of the increased requirements of milk and milk products, the Indian dairy industry has a wide scope for growth and development.

Livestock:

One cannot think of improving Indian agriculture without first improving its livestock. Cattle are indispensable in Indian agriculture. At present more than 50 percent of the total agriculture income is derived from cattle.

India has the largest cattle, buffalo and goat population in the world. here are about 179 million cattle, 58 million baffaloes and 68 million goats in the country. About 1/6 of the cattle, about 1/2 of the buffaò and 1/5 of the goat population of the world are in India. Animal husbandary plays an important role in the national life and accounts for about 10 percent of the national income.

On an average about three persons in India possess one cattle or buffalo. Whereas this figure in context with the world population is about 4 persons possess one cattle. In the United States of America the cattle population per hundred persons is about 51 and only 32 cattle per hundred persons in India.[7]

Milk Production and Per Capita Availability:

In the past, dairying was not considered as a paying enterprise to be carried as a business and it was in the hands of Halwais and Gaolis and illiterate rural farmers who were following traditional method of rearing cows and buffaloes. Prior to independence, dairying in India was neglected field. The progress of this industry started only after the independence. Today dairying is both a science as well as an art and has witnessed quite a high rate of growth during the last decades. There was rapid transformation in the mode of production from the traditional methods to the most modern and uptodate methods Many factors were responsible for the remarkable development of the milk industry in India. The major factors were, growth of cities, improvement and advancement in science and technology in the dairy field and improved livestock by way of cross breeding and rigorous selection.

In India semi-Commercial dairying started with the establishment of military dairy farms and co-operative milk unions throughout the country; towards the end of 19th century. However, the market milk technology may be considered to have commenced in 1950, with the functioning of the Central Dairy of Arrey Milk Colony and milk product technology in 1956 with the establishment of AMUL Dairy Anand.

Since 1950-51, the Indian dairy industry has made remarkable progress. From 1950-51 the milk production in India has been increasing rapidly. The table 2.2 shows the increase in milk production in India.

TABLE NO. 2.2

Growth in Milk Production in India.

Years	Milk Production (MMT)	Annual Growth Rate
1950-51	17.40	-
1955-56	19.50	2.01
1960-61	19.84	0.72
1965-66	20.47	0.64
1970-71	21.41	0.92
1975-76	24.53	2.91
1980-81	31.53	5.71
1982-83	34.70	5.03
1985	41.00	N.A.

Source : 1. Special report of NDDB on operation flood I & II Page No. 31 (Year not mentioned)

2. India - Economic Information Year Book 1987-88 by A.N. Agrawal, Verma, Gupta P.No.104

It is clear from Table No. 2.2 that the milk production in the country has been rapidly increased from 1950 to 1985. In the year 1950-51 the milk production in India was of 17.40 million tonnes. It is increased upto 19.84 million tonnes in the year 1960-61. After that the production of milk also increased steadily as in the year 1970-71 21.41 million tonnes, in the year 1980-81 31.53 million tonnes and in the year 1985 41.00 million tonnes. From 1950-51 to 1985 there is increase of 23.60 million tonnes. Now, India is leading in milk production

holding the 4th position in the World.

However, during the past three decades, increase in milk production has failed to keep pace with increase in human population. The table 2.3 shows the per capita milk availability in India.

TABLE NO. 2.3

Per Capita Milk Availability in India

(1950-51 to 1985)

Year	Estimated Human Population (In crores)	Per capita daily milk availability (Grams)
1950-51	36.3	131
1955-56	39.8	132
1960-61	43.3	126
1965-66	48.7	115
1970-71	55.1	106
1975-76	61.7	110
1980-81	68.4	126
1982-83	71.0	134
1985	N.A.	144

Source : 1. Special Report of NDDB on operation flood I & II Retrospect and Prospects P. No.31

2. Indian Dairyman 1986 - P. No.522

From Table No. 2.2 and 2.3 we say that, during the period from 1950-51 to 1970-71 milk production increased by 23 percent whereas human population increased by 52 percent.

Hence the per capita milk availability declined from 131 grams per day in 1950-51 to 106 grams per day in 1970-71. After that it is increased to 126 grams per day in 1980-81; 144 grams per day in 1985. But this level of milk availability is also lower than the minimum nutritional requirements of 210 grams per day, which is recommended by the National Expert Committee Group of the Indian Council of Medical Research. However, this normodive index is much lower than the world average of per capita milk availability of 281 grams per day.[8]

There are regional differences also in the per capita milk availability in India. The per capita availability of milk per day in metropolitan cities is higher i.e. 230 grams than that of small cities i.e. 170 grams. In rural area there is very very low per capita availability of milk per day i.e. 63 grams.[9]

It is astonishing to note that, although India possess nearly 1/5 of the Worlds bovine population (cow, buffalo and goat) milk production in India accounts for only about 1/20th of the World milk production. In India the human population has been growing at a faster rate than the rate of increase in the milch animal population. On the otherhand the productivity of milch animals did not show any signficant increase. Thus, in India the per capita availability of milk is low.[10]

Role Of Co-operation in Indian Dairy Industry :

According to H. Calvert " Co-operation as a form of organisation wherein persons voluntarily associate together as

human beings on a basis of equality, for the promotion of the economic interest of themselves." [11] In India co-operative dairy farming is an important productive activity. The co-operative dairy is an agency which carries production as well as sale on behalf of milk producers who are nable to earn good profits. In dairy industry co-operatives have been recognised to be an effective measure to improve the milk production potential and thereby to make better the socio-economic life of millions of small, marginal and landless cattle owners scattered over large areas. Even in advanced countries like Holland, Denmark, U.S.A. and New Zealand dairy co-operatives have been playing very important role in developing dairy industries. In these countries from 75 percent to 90 percent of the milk and milk products are handled by the co-operative dairies. But in India such co-operatives have not developed properly.

The dairy industry in India is, however, faced with several problems such as :

I) Scattered and small scale milk production which is produced by small farmers and landless labourers with one or two cows or she-buffaloes. The small quantity itself makes it difficult to be transported to the comsuming area.

II) Most of the milk is produced in rural areas while the profitable market exists largely in urban areas.

III) Milk and Milk products are perishable goods, hence it must be supplied quickly to consuming area, but there is inadequate transport facilities in most part of the country.

IV) The breeds of cattle are mostly indigenous, with low milch capacity and therefore the cost of production is rather high.

V) Non-availability of veterinary services in the rural areas, inadequacy of properly organised system of processing and marketing and lack of cheap and nutritious feed and fodder adversely affects the production of milk.

VI) Even if the quantity of milk is sufficient for supply to the market, the producer often has not direct link with the consumer and hence the price received by him is rather low.

In view of the above problems, it has been rightly recognised by the planning commission and recommended that " Producers co-operatives should be organised in villages to supply milk to the urban milk supply schemes, creameries, milk powder making plants and to the consumers. This would not only ensure adequate supplies of fresh milk to the urban consumer but also brings a profitable returns to the --- producers. " [12]

Today the dairy co-operative societies play a significant role in the development of dairy industry in India

The first dairy co-operative society in India was started at Allahabad in 1913. After this the Calcutta Milk Supply Societies Union was established in 1919. It was the earliest co-operative organisation in the country for the supply of clean and pasteurised milk to consumers. Before independence some dairy farms along with co-operative societies and unions were also formed. In 1946 the dairy farms of Kheda (Kaira) formed a Kaira District Milk Producers Union Ltd. comprising two village co-operative societies. The establishment of dairy co-operatives has been the most important feature of the dairy industry in India after independence.

The structure of the dairy co-operatives consists of Primary Milk Producers Soieties, District Co-operative Unions, State Co-operative Federation and the National Co-operative Dairy Federation. In every village we have a milk co-operative society managed by elected representatives of the milk producers members. These village co-operative societies are federated into a District Co-operative Union, which owns and operates dairy plants. Each district co-operative Union is managed by a Board of Directors elected from amongest the Chairman of the village societies. The village level milk societies are concerned with helping the members to increase their production of milk and the arranging for its profitable sale in the consumer markets through the District Co-opeative Unions. We have a third level which is at the state level, where chairman of District Unions elect the Board of Directors of the State Co-operative Federation and recently we have at the national level the National Co-operative Dairy

Federation of India. It is the apex body of the dairy co-operatives in India which was set up in 1970.

After indepencdne co-operative sector plays a significant role in the dairy development. On December 31, 1978 there were 190 dairy plants in India of which 80 were in the co-operative sector as against 1980-81, there were 197 dairy plants, of which 82 were in the co-opearative sector.

The overall progress of dairy co-operative in India is presented in the Table No. 2.4

TABLE NO. 2.4

Progress of Dairy Co-operatives in India.

Year	CMSU			PMSC		
	Number	Member-ship (in lakh)	Value of Sale(in crores)	Number	Member-ship (in lakhs)	Value of Sale(in crores)
1953-54	56	2689	2.04	1354	1.17	2.00
1960-61	94	15528	4.72	3200	2.38	5.44
1965-66	135	25524	18.45	8065	6.97	17.53
1970-71	148	31433	57.20	11900	40.23	49.31
1975-76	216	61751	136.79	22537	18.67	145.16
1980-81	N.A.	N.A.	N.A.	29169	26.68	217.18
1982	N.A.	N.A.	N.A.	36566	32.31	382.8

Source : 1. Annual Report, Govt. of India, Ministry of Agriculture (Department of Agriculture and Co-operation) 1982-83 P. 121

2. India 1985, A reference annual by Research and Reference Division, Ministry of Information and Broadcasting, Govt. of India P. 309.

The above table No. 2.4 shows that there has been a many-fold increase in the number, membersh and sale of milk co-operatives in the country.

2.4 DAIRY FARMING IN MAHARASHTRA :

Maharashtra State, though not a leading state in dairy development activities in terms of milk production and handling of milk, it is one of the progressive States in adopting the various activities on large scale to enhance milk production and in organizing milk processing industry on modern lines.

From 1960 Maharashtra has consistently pursued a policy of promoting co-operative movement which has played an important role in bringing about radical economic transformation of the countryside. The total number of co-operatives were 33,365 in June 1961. It increased upto 79,291 in 1985-86. In the same trend the membership of the co-operatives also increased during the same period.

It is well-known that the co-operative movement has strengthened sugar industry in Maharashtra. The State has the largest number of co-operative sugar factories. Like sugar co-operative factories today Maharashtra has achieved a fairly good success in dairy industry through co-operative structure which did not exist in the past.

Milch Animals and Animal Husbandry :

The development of dairy industry depends upon the ability of milch animals, their number and quality, animal husbandry practices, availability of consuming markets etc.

According to 1978 livestock census, the total livestock of Maharashtra was 29.6 million consisting of 15.2 million cattle, 3.9 million buffaloes, 10.2 million sheeps and goats and 0.3 million other livestock. In case of animal husbandry, at present there are 12 cattle breeding farms, one intensive cattle development project, 29 artificial insemination centers, one frozen semen station and 2655 artificial insemination sub-centers out of which 1252 sub-centers have frozen semen facility. The special livestock production programme for milk, sheep, poultry and piggery, a centrally sponsored programme is being implemented in 14 selected districts viz. Thane, Pune, Ahmednagar, Satara, Sangli, Solapur, Bid, Nanded, Wardha, Nagpur and Bhandara. Marketing of livestock products and other products is being done by the MAFCO a state govt. undertaking.[13]

Milk Production and Per Capita Availability :

The dairy development programme of the state has been progressing at a fast pace and the state is leading in milk production, holding the third position after Uttar Pradesh and Rajasthan. After implementation of dairy development programme, the milk production in the state has been rapidly increased. In the year 1975, the milk production in Maharashtra was of 4 lakh litres per day. It increased upto 5 lakh litres per day in the year 1977. After that the production of milk increased steadily as in the year 1980- 15 lakh litres per day, in the year 1985 - 22 lakh litres per day and in the year 1987 - 25 lakh litres per day. It means from 1975

to 1987 there is increase of 21 lakh litres per day. It shows the remarkable increase in the milk production. Before 1983 there was shortage of milk in the State. Hence upto 1983 Maharashtra imported milk from other States. But after 1983, Maharashtra exported the milk to Andhra Pradesh, Bengal, Madhya Pradesh and Bihar.

Though there is increase in milk production in the State, the per capita daily milk availability is low, that is 84 grams per day. In India it is 144 grams per day. But level of milk availability is also lower than the minimum nutritional requirements which were recommended by the National Expert Committee Group of the Indian Council of Medical Research.

Dairy Development Programmes :

To increase the production of milk and handling of milk, the Maharashtra Government is implementing the Operation Flood Programme, Intensive Cattle Development Programmes and Drought Prone Area Projects. Due to Operation Flood Programme, 14 lakh people have got supplementary occupation in the State, out of which 70 percent are landless labourers and economically weaker farmers.

Progress and Growth of Dairy Co-operative Societies :

In Maharashtra, dairy development activities were started in the year 1949 when a beginning was made by establishing Arrey milk colony at Bombay. The demand for milk was continously increasing and hence the government decided to develop milk pockets at various places of the State from time to time.

Today Maharashtra has achieved a fairly good success in dairy activity through co-operative structure. The dairy co-operative societies have played a significant role in the collection and marketing of the milk. Today about 85 percent of the milk is handled by the co-operative dairies. From 1961 the co-operative dairy society had made a remarkable progress. The Table No. 2.5 shows the progress of co-operative dairy societies in Maharashtra.

TABLE No. 2.5

The Progress of Dairy Co-operative Societies in Maharashtra (from 1961 to 1986)

Item	YEARS				
	1961	1971	1981	1985	1986
Societies and Unions	450	2067	7909	11108	12064
Membership	175	1359	7191	9596	10200
Share Capital	10	117	679	1064	1180
Of which Govt	NA	10	44	96	110
Owned funds	13	199	1748	3350	4020
Borrowing outstanding	14	247	1206	2391	2700
Working Capital	36	624	5095	10006	12050
Milk Procured Value					
a) Unions	07	784	8541	20319	23000
b) Societies	67	810	8531	20165	25500

Item	1961	1971	1981	1985	1986
Milk and Milk Products Sold					
a) Unions	08	909	8831	22340	25000
b) Societies	09	855	9132	20440	21500
Societies in Profit	162	856	4142	5989	6010
Profit	2	25	226	328	350
Societies in Loss.					
Loss	1	13	78	173	190

Note: 1. Rs. in lakhs
2. Members in hundreds
3. * Provisional
4. NA - Not available

Source : Co-operative Movement at a Glance in Maharashtra State 1986 P. 39

Milk Processing Capacity:

Today there are 34 large government milk schemes in Maharashtra State. During the year 1984-85, the government milk schemes in the State procured 54 crore litres i.e. 25 percent of the total milk production.

There are four dairies in Greater Bombay and a new dairy is proposed to be set up at Thane for Kalyan, Thane Bhivandi and other townships in Thane district. The government

dairies exceeded the 6th plan milk handling target of 15.10 lakh litres per day by over three lakh litres. At the end of the 7th Plan period the handling capacity is proposed to be raised to 25 lakh litres per day.

At present there are 6 milk powder plants in the state, three in the state sector at Sangli, Osmanabad & Nanded and three in the co-operative sector at Kolhapur, Jalgaon and Pune. The state government proposes to set up two more milk powder plants in Marathwada and Vidarbha during the 7th Plan period.

Problems:

The dairy industry in Maharashtra has to face several problems. Such as scattered and small scale milk production, inadequate transport facilities, shortage of technical and skilled personnel, lack of properly organised systems of marketing. Similarly the members of the dairy co-operatives or dairy farmers face innumerable problems in dairy development such as lack of finance, for purchase of cows, buffaloes, feeds and fodder, lack of fodder and grazing land; lack of technical knowledge in animal management, lack of veterinary aids etc. Systematic efforts made through planning during the last decades has enabled us to solve a few problems but still a lot of progress is yet to be made to solve many complicated problems of dairy industry.

2.5 DAIRY FARMING IN SATARA DISTRICT:

Satara district is situated in the Western part of Deccan Plateau. The district lies between 17° 5' to 18° 11' North latitudes and 73° 33' to 74° 54' East longitudes. It is surrounded by Pune district at the North, Solapur at the East, Sangli at the South, Ratnagiri at the West and Raigad at the North-West. The major portion of the district is in the Krishna Valley and minor portion is covered by the Bhima and Koyna Valley. The area of the district is 10,484 sq. Km. and it ranks 15th amongst the total 30 districts of the State in respect of area. The area of Satara district is 3.4 percent of the total area of the State. According to 1981 census, the total population of the district is 20,38,677 of which 87 percent population is rural population and 13 percent is urban population.

As per the Agriculture census of 1976-77 there were 3,20,401 land holders holding 7,64,729 hectares land in the district. Out of total land holders 63 percent land holders are small farmers holding upto 2 hectares in the district; but the total area occupied by them is mere 20 percent. Land holders holding the land more than 10 hectares are only 3 percent but they hold 22 percent of the total land.

The basic resources required for the dairy development and their development potentiality is larger in Satara district. In 1980-81 the district had 2,32,986 she-buffaloes. Their number increased upto 2,33,168 in 1985-86. In case of

cows in the year 1980-81 the district had 1,77,012 cows. It decreased upto 1,72,100 in the year 1985-86. From 1980-81 to 1985-86 the she-buffaloes increased by the rate of 0.08 percent and the cows decreased by the rate of 2.77 percent. In 1980-81 the district had 82,182 hectares a grazing land which increased upto 91,353 hectares in 1985-86. Hence the scope for expanding dairy activities in the district as subsidiary occupation to the majority of the farmers seems to be larger.

The whole dairy industry in Satara District is developed in two sectors viz; The Government Sector and the Co-operative Sector. Out of 12 collecting unions, 5 are in Government Sector and remaining 7 are in co-operative sector. The Table No. 2.6 shows the position of government sector in Satara district.

TABLE NO. 2.6

The Position of the Government Sector:

Sr. No.	Name of the Scheme	Date of commencement.	Storage capacity of milk per day(in litres)
1.	Govt. Milk Scheme, Mahabaleshwar	25.02.1966	10,000
2.	Govt. Milk Scheme, Satara	01.10.1979	50,000
3.	Govt. Chilling Center, Pargaon	27.07.1980	10,000
4.	Govt. Chilling Center, Vaduj	10.07.1981	10,000
5.	Govt. Chilling Center, Phaltan	31.10.1981	20,000

Source : District Dairy Development Office, Satara.

The above government milk schemes have been playing an important role of the intermediaries which collects milk from the co-operative unions within their jurisdiction and supply almost the 3/4 of the total quantity of milk collected to their apex marketing organisation the dairy development department Arrey.

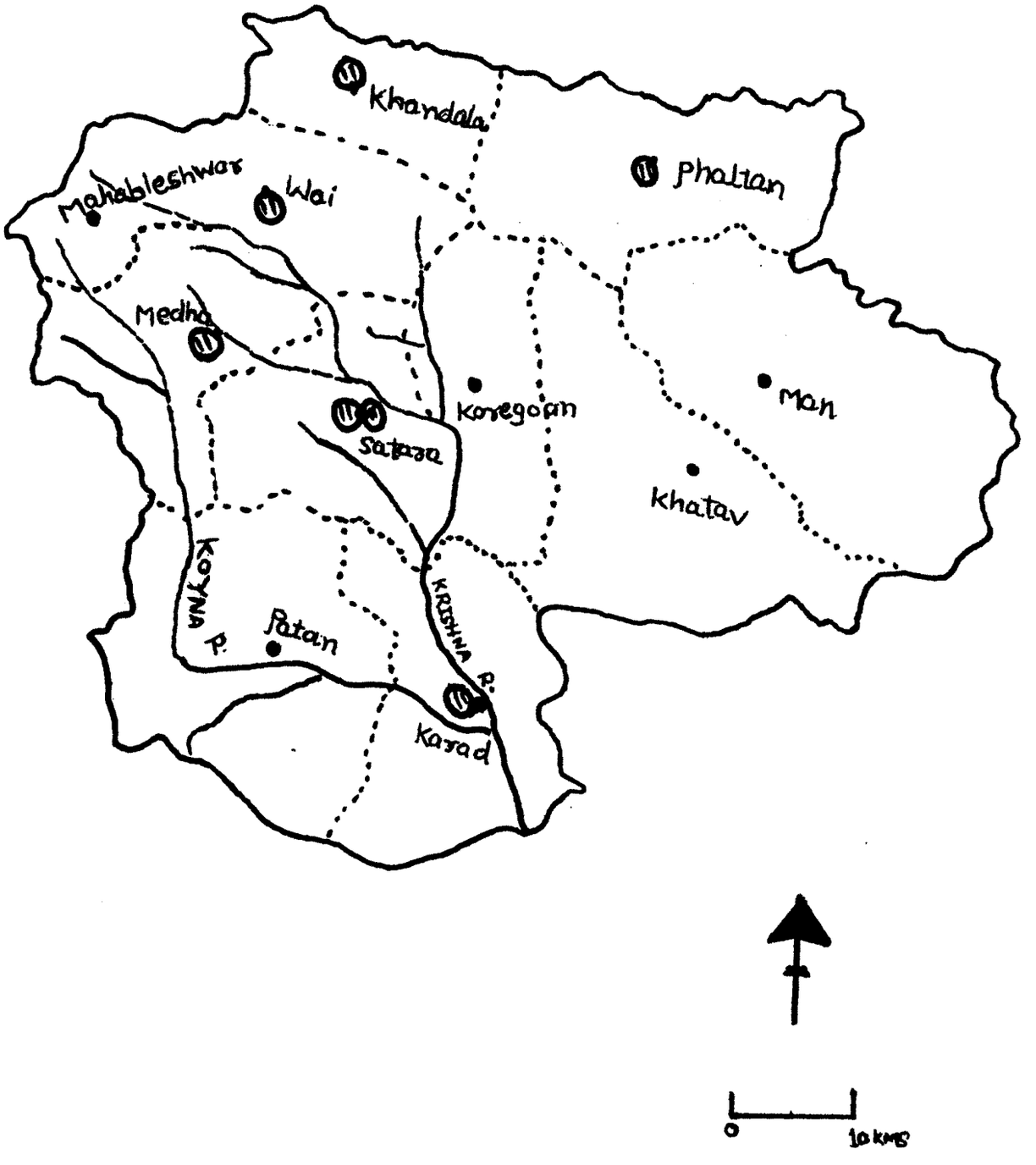
The co-operative sector had been also playing the important role in the development of dairy industry in Satara district. There are 7 co-operative unions in Satara district which collect milk from primary co-operative dairy societies. These are as follows :

Name of the Sangh (Union)	Date of establishment
1. Koyna Co-operative Union, Karad	01.10.1957
2. Satara Co-operative Union,Satara	22.08.1962
3. Ajinkya Co-operative Union,Satara	18.09.1964
4. Wai Co-operative Union, Wai	15.03.1973
5. Jawali Co-operative Union, Jawali	04.11.1974
6. Phaltan Co-operative Union,Phaltan	22.12.1976
7. Khandala Co-operative Union,Khandala	28.09.1977

Except Koyna Co-operative Union, Karad, all the co-operative unions supply their procured milk to the govt. schemes in the district. Only co-operative union i.e. Koyana Co-operative Union, Karad supplies its procured milk directly to the marketing organisation of the Government Department, Bombay. Among the above 7 co-operative dairy unions the Koyna Co-operative Union, Karad is the first and largest union and is directly attached to the Govt. scheme Bombay for market purpose.

Map No 2.1

Co-operative Dudh Sangh in Satara District



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- Taluka head quarter
- Dudh Sangh

There are 798 primary co-operative dairy societies in the district. The table No.2.7 shows the talukawise primary co-operative dairy societies in Satara district.

TABLE NO.2.7

Development of PDCS in Satara District:

(Talu awise)

Taluka	1983-84	1984-85	1985-86
Satara	85	91	96
Wai	54	57	59
Jawali	63	66	73
Mahabaleshwar	7	7	10
Karad	116	126	137
Patan	73	86	97
Koregaon	56	66	71
Phaltan	84	95	99
Khandala	42	43	45
Man	32	40	43
Khatav	57	62	68
	672	739	798

Source : Dairy Development Office, Satara.

From the above table we say that there are increase in number of PDCS. The number of PDCS increased from 672 in 1983-84 to 798 in 1985-86. Among all talukas four talukas namely Karad, Patan, Phaltan & Satara have maximum number of PDCSs.

Karad taluka is the highest in case of the number of PDCSs, i.e. 116 in 1983-84, 126 in 1984-85 and 137 in 1985-86.

The overall growth of the co-operative dairies in Satara district is shown in the table No.2.8

TABLE NO.2.8

Growth of Co-operative Dairies in Satara District :

(from 1981-82 to 1985-86)

	81-82	82-83	83-84	84-85	85-86
Dudh Sangh	7	7	7	7	7
PDCSs	553	604	672	739	798
Total number of members	42254	46365	56532	66706	767353
Share capital (Rs. in lakhs)	35.03	38.81	46.81	116.00	285.40
Working capital (Rs. in lakhs)	35.91	567.11	568.58	519.00	860.09
Profit (Rs. in lakhs)	3.74	21.54	21.78	26.66	25.50
Loss (Rs. in lakhs)	1.24	3.32	6.23	2.66	2.93

Source : District Dairy Development Office, Satara.

From the above table we say that the number of co-operative unions in the district remained constant from 1981-82 to 1985-86 i.e. 7. The number of PDCSs and their members increased step by step in 1981-82. There were 553 PDCSs with the membership of 42254 and it increased upto

798 and 7,67,353 respectively in 1985-86. The share capital and the working capital were also increased in the period of 1981-82 to 1985-86. The share capital of PDCSs increased by about 8 times and the working capital of PDCSs increased by about 24 times.

2.6 OPERATION FLOOD PROGRAMME:

In recent years India's huge dairy development programme is known as Operation Flood Programme. It is also known as a White Revolution.

Operation Flood - I:

Operation Flood I is listed in the files of WFP. Its total cost is 166 million dollars. It was approved by the Indian authorities in October 1969, the plan of operation was signed in March 1970 and the first utilization of dairy commodities provided by the WFP took place in July 1970 to continue for a proposed period of five years (170-75). The original five year duration of operation flood was extended upto 11 years and this period (170-1981) came to be described as the first phase of the programme.

The objectives of operation flood I programme were:

1. To make available wholesome milk at stable and reasonable prices to the bulk of city consumers, including vulnerable groups namely pre-school children, nursing and expectant mothers with major effects on protein intake.

2. To enable the dairy organisation involved in the project to identify and satisfy the needs of consumers and producers, so that consumers preferences can be fulfilled economically and producers can earn a large share of the price paid by the consumers for their milk.
3. To improve productivity in dairy farming in rural areas with the long term objective of achieving self-sufficiency in milk, thereby bringing major increases in agricultural output and incomes with special emphasis on improvement of the income of small farmers and landless people.
4. To remove dairy cattle from the cities where they represent growing problems in terms of genetic waste, social cost and public health.
5. To establish a broad basis for accelerated development of the national dairy industry in the project period as well as after.[14]

The scope of the operation flood I was confined to serve milk markets into four metropolitan cities - Bombay, Calcutta, Delhi & Madras by organising 18 milk co-operatives on Anand pattern in the hinter land milkshed areas. The aim was development of dairying by increasing milk production in the selected milkshed area and to serve the urban markets by creating physical facility to handle liquid milk.

To handle the financial aspect of such a programme, the IDC came into being in 1970 to launch operation flood.

The IDC and the NDDB have a common Chairman and Board. The two bodies are closely co-ordinated and they are often referred to jointly as the project authority responsile for operation flood.

According to the"National Commission of Agriculture 1976, " the progress of the operation flood I was fairly satisfactory with regards to handling capacity, but slow with regard to the objective of increasing milk production by providing technical inputs and developing improved milch cattle.[15]

Financially, the project has been a success too. Against an amount of Rs. 112.7 crores generated by the sale of donated commodities till October 1980, the total expenditure under the project was Rs. 112.2 crore. [16]

The target set for operation flood I was to cover one million milk producers with 1.875 million milch animals in 18 milk sheds. By 31st Dec. 1980, over 10,000 Anand pattern co-operatives with 1.36 million milk producers had been organised in 27 hinter-land milkshed official estimates for India as a whole indicate an increase in annual per capita supply of milk from 38.5 kg. of milk equivalent in 1969 to 44 kg. by 1980, to which imports contributed less than one percent. The processing capacity in the four metropolitan cities was more than double from one million to 2.9 million litres a day against the target of 1.48, with further expansion under way. The processing facilities in the rural milkshed have been increased fivefold to 3.4 million litres daily, although the target was 1.48.

75 percent of the metropolitan and 72 percent of the rural capacity was being utilized. [17]

Operation Flood II:

Operation Flood II programme officially started from April 1981. It is built on the foundation established by Operation Flood I. It is mainly an extension and intensification of the first phase to cover more cities and districts of India. The pattern of development under operation flood II will essentially be the same as under operation flood I. The objectives of the operation flood II are as follows :

1. To enable some ten million rural milk producers families to build a viable, self sustaining dairy industry by mid-1985.
2. To enable the milk producers to rear a National milch herdi of some 14 million crossbreed cows and up-graded buffaloes during the 1980.
3. To erect a National milk grid which will link the rural milksheds to the major demand centres with urban populations totalling some 150 millions.
4. To erect the infra-structure required to support a viable dairy industry.
5. To enable milk and milk products to form an appropriate part of a stable nutritionally adequate national diet.

Operation Flood II involves greater investment. The initial budgeting of the 2nd phase is Rs. 4,855 million. The phase 2nd is much wider in scope. Flood I uncentrated on

milk supply to the 4 metropolitan cities but flood II covers 147 cities. The first phase of the operation flood programme covers 18 milksheds. whereas the 2nd phase involved 155 milksheds.

At the end of operation flood II 4.1 million farmers have today organized themselves into 41,000 village milk co-operative societies, which are federated into 152 district milk co-operative unions, owing 152 dairy plants, cattle feed plants, chilling plants etc. These again are federated in 22 state level federations in 22 states of India. As a result of this achievement, the milk procured by the end of 1985, has reached almost ten million litres per day. The per capita consumption of milk in India risen from 107 grams per head in 1970 to 144 grams per head in 1985.[18]

Operation Flood III :

Phase III of operation flood started in 1985-86 and will complete by 1989-90. The third phase of the operation flood programme is likely to be implemented shortly, as a result of which the processing facilities, conversion facilities institutional structures, technical input programme. National Milch Herd and National Milk Grid Programme are likely to undergo redical changes, which will result in high production of milk and milk products by the end of 1990. For instance, the project will assist in the formation of 18,000 village level milk co-operative societies in 170 co-operative unions and the number of milch animals in the co-operative. Ambit will be increased from 5.2 millions to 15.4 millions by 1990.

The phase III of operation flood programme will enable the state co-operative federations to build up the basic and supporting infrastructures which will further enhance milk production in the milksheds. [19]

The production of milk products like skimmed milk powder, milk powder, milk fat, cheese, ice-cream and indigenous products like ghee, shrikhand, pedhas, have not only gone up considerably in the recent past, but will further go up by 1990. The manufacture of indigenous products is being taken up on the scientific lines.

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