Chapter-II

OPERATION FLOOD – A HISTORICAL REVIEW

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Agriculture is the dominant sector of the Indian economy and India's agriculture continues to be dominated by the belief that its base is crop production. Its importance is beyond dispute, since food grains fulfill the first basic need by providing calories for the sustenance of the country’s population. Having achieved a level of self-sufficiency in cereal production, the base of farming needs to be broadened to enhance the quality of the daily diet, as represented by animal proteins, the major source of which is milk.

The success of milk production in India has truly been spectacular. Over the years, dairying has become one of the key components of Indian agriculture and milk has emerged as the largest agricultural crop in the country with a contribution of Rs. 50,051 crores (in producer price) to the national economy in 1994-95. By 1997 the value of dairy output was estimated at Rs. 1,05,000 crores and the same is projected at Rs. 1,50,000 crores in 2000 AD.

The expenditure on milk and milk products increases rapidly with income levels. It becomes higher than that on cereals and far higher than that on all other major food groups consumed by the higher income class in rural and urban areas. According to a study conducted by Dr. Vasant P. Gandhi and Dr. Gyanendra Mani, when the percentage expenditure on total food and cereals in both rural and urban areas had declined between 1970-71 and 1989-90, the same on livestock products showed an increase in both areas. In urban areas, the study shows a decrease in food expenditure from 64.4 to 55.5 percent and on cereals from 35.6 to 25.7 percent. But the share of livestock products increased from 20.3 to 24.7 percent by 1989-90. In rural areas, when food expenditure decreased from 73.7 % to 64.3 % and that on cereals from 54.4 % to 37.5 %, expenditure on livestock increased from 15.5 % to 20 %. In both the cases, livestock products showed an increase of nearly 5 per cent. This indicates that the demand for milk and milk products will grow rapidly with the economic development of the country and the corresponding increase in income.
As predicted by the Planning Commission, in recent years dairying has emerged as an important sector for providing employment and additional income especially to rural households in India. Dairy development fits most appropriately in the country’s program of increasing food production, rural employment and equitable distribution and its contribution to the nation’s health and economic welfare is rather unique. Advances in animal husbandry have undoubtedly touched and transformed the lives of the largest number, mainly downtrodden farmers, in India. The advent of crossbred cows has made milk production remunerative and it has emerged as a viable enterprise. At present, farmers are generating an incremental income of Rs. 50 million every day, amounting to over Rs. 18,000 millions/year. The growth in the dairy sector has been at an encouraging six per cent. All these achievements were mostly due to the efforts made under a mammoth project called ‘OPERATION FLOOD’ started in the year 1970.

Operation Flood (OF), perhaps the most significant rural employment project in the country today, has developed over the years an infrastructure that harnesses the productive energies of over seven million milk producers in some 267 districts in 22 states/union territories in a co-operative network of over 69,600 village societies. Individually, their output of milk may just be a trickle, but it all adds up to a ‘flood’ of some 109.4 lakh liters of milk per day for sale to millions of urban consumers in 526 cities and towns. This organized dairy development has pushed up milk production so much that it occupies the top slot in agricultural output.

In the past, dairy farming was basically carried out and managed at the household level. Milk and its products were produced mainly for home consumption and, to some extent, for local market. Rapid growth of urban population, change in food habits, technological advancement in transportation, processing and refrigeration have however, brought out significant changes in the pattern of production and marketing of milk. Commercialization of milk production, manufacturing of milk products in factories, processing and standardization of milk for marketing and long distance movement of milk and
milk products are some of the basic features of a modern dairy industry. Even in this new form, basic activity of milk production has remained an adjunct to crop farming in a major part of the country, although there is a change in the nature of dairy farming at the household level. It is changing from a value-in-use producing to a value-in-exchange producing activity, *viz.*, from the domestic economic unit to an enterprise.

### 2.1. Historical background

In India, organized dairying commenced only in the 19th century. This was primarily for the benefit of military forces and their families. During this period and even at the beginning of 20th century, when the military farms introduced some sort of scientific approach to animal husbandry, milk production and its local distribution remained the limited definition of dairying. Only during the second half of the last century with modernization and adoption of advanced scientific techniques, Indian dairy industry diversified into functions such as production of milk and its procurement, processing and marketing on a large scale.

After 1950, with the implementation of five-year Plans and subsequently under the considerable patronage of the Govt. of India, Indian dairy industry made rapid progress towards modernization and by the 1970’s it had achieved a prominent place as an industry of national importance. The major events in the Indian dairy sector from the period of British rule to date can be examined in three distinct phases: - 1) Pre-independence phase, 2) Post-independence phase-Before the OF Program and 3) Development under the OF Program.

#### 2.1.1. Pre - Independence Phase

Under the British rule, the organized dairy activity in India was limited to the supply of milk to British troops. The first major event under the British rule was the establishment of a Board of Agriculture (1914) and its recommendations were implemented on a limited scale to achieve the following objectives:
1. Establishment of dairy farms at important places by the defense department with the objective of supplying milk to the British troops.

2. Conducting a preliminary study on the composition of milk produced by cows and buffaloes in India

3. Establishment of pedigree herds of Indian breeds.

Accordingly, military farms were established at places like Bangalore, Willington (Ootty hills) etc. In 1920, Mr. William Smith arrived as the Imperial Dairy Expert to study the existing potential and problems of the military dairy farms. Realizing the possibilities of development, Mr. Smith emphasized scientific long term planning for the enhancement of milk production. His effort was to increase production of milk on a long-term basis by implementing scientific breeding, feeding and management. He also recommended undertaking training and extension work by a properly developed center to create ready availability of technical personnel who could effectively participate in breed development and scientific management of farms.

Following the recommendations of Mr. Smith, Military farms at Bangalore, Willington (Ootty hills) and at Karnal were transferred to the Department of Agriculture in 1923. The Karnal farm was converted into Cattle Breeding Farm and the farm at Bangalore was developed as the Imperial Institute of Animal Husbandry. In 1924, this institute started graduate and post-graduate diploma and other short courses in dairying.

Another important event in the pre-independence period was the establishment of Imperial Council of Agricultural Research in 1929. Shortly after that, in 1931, the office of the Imperial Dairy Expert and the Imperial Institute of Animal Husbandry were brought under the Central Government Department of Education, Health and Lands. Later on the Bangalore institute was renamed the Imperial Dairy Institute. These developments indicate that the then Govt. of India attached due importance to the development of Animal Husbandry and Dairying.
An important landmark in the history of dairy development in the pre-independence period was the arrival of Dr. N.C. Wright, Director, Dairy Research Institute, Scotland, in 1936. He was invited to review the progress of dairying in India and his four years' stay in India (1936-40) gave a remarkable impetus to dairy development. Dr. Wright’s recommendations, which he made in his report "Marketing of Milk in India and Burma", are relevant and important even to this day. Some of the major points in his report were:

a) Lack of organized milk industry in India and of ready and remunerative market for milk produced in rural areas.

b) In the absence of ready and assured market, the chances of proper developmental inputs were very remote.

c) India had to develop its own technology and technologists to solve problems of dairy industry.

d) Being a country of villages inhabited by marginal farmers and landless laborers, dairy development in India had to involve these widespread rural pockets to promote dairy development on co-operative lines. That was the only way towards tangible progress.

The then Govt. of India seriously took up the recommendations made by Dr. Wright and, accordingly, some definite steps were taken for the development of dairy sector. The major steps taken were:

a) The Imperial Dairy Institute at Bangalore was reorganized as the Imperial Dairy Research Institute in 1941. Later on it was renamed Indian Dairy Institute and, subsequently, as the National Dairy Research Institute in 1955 with regional stations.

b) Academic training program and research in dairy technology and dairy husbandry were accelerated under the Director of Dairy Research, a top senior official position first held by Dr. Devis and taken over from him by Dr. Z. Kothavala, who later become the Dairy Development Adviser to the Govt. India in 1944.

c) The Polson Dairy at Anand was entrusted with the supply of pasteurized and chilled milk to Bombay Milk Scheme. By starting
this activity in 1945, they bridged the gap between the market at Bombay and milk production at Kaira district in Gujarat.

d) Though co-operative dairies were started much earlier in U.P. and Madras, the first farmers’ integrated co-operative complex was established in Kaira district at Anand in 1946. After independence, the Aarey Milk Colony and Amul set together a fast pace of dairy development with emphasis on developing techniques of processing and marketing suitable to Indian conditions.  

During World War II a more intensive effort was made especially by private dairies like Polson, Caventers and Express Dairies to modernize processing facilities. These dairies made available processed milk, table-butter and ice cream on a small scale, at metropolitan cities such as Bombay, Calcutta, Delhi and some other large townships. Before the end of World War II, Polson Dairy had begun to collect, in bulk, milk produced in the rural areas of Kaira District in Gujarat, to pasteurize it and transport it by rail to Bombay for consumption in the city. All these private dairies, functioning in the urban areas, were not concerned with improving the breed of milch animals reared in the rural pockets and were content with contracted milk supply through middlemen or their own staff.

The milk producers who were supplying milk to Polsons had to depend for the sale of their milk on contractors and middlemen who exploited them, giving them very low price during the flush season. In order to protect their interests, on the initiative of political leaders, particularly Sardar Vallabhbhai Patel, the farmers of Kaira organized themselves into a co-operative in the late 1940’s. The coming into being of the Anand Milk Union Limited which began to supply pasteurized milk to Bombay, 400 kms. away, was an important land mark in the development of dairy industry in India. This later led to the adoption of the so-called Anand Pattern all over the country.
2.1.2. Post-Independence Phase - Before OF

Dairying and animal husbandry received serious attention during the period of planned development under government control. Concerted efforts were made for the development of the dairy sector in all Five-year Plans and Annual Plans. Weighed individually each plan had a commendable set of objectives for dairy development.

When the First Five-year Plan started, with the increasing pressure on land, fragmentation of land holdings and decrease in area under pasture, rural milk production was beginning to fall far short of the growing consumption needs, which was most noticeable in urban areas. Adulteration and high prices were widely prevalent. Under these circumstances, promotion of dairying, it was felt, would not only make an essential dietary item available in requisite quantities at reasonable price but also create substantial employment opportunities in the rural areas.

The First Five-year Plan started with an outlay of Rs. 8 crores for the dairy sector with the main objective of increasing milk production through Key Village Scheme\(^1\). It was a scheme of establishing key village blocks throughout the country. Key village is a center consisting of three to four villages, having a population of about 500 cows (above the age of three years), where the breeding was confined to superior bulls and artificial insemination. The Plan also proposed the establishment of veterinary hospitals and artificial insemination centers. It also proposed the Gosadan scheme that segregate and send old, infirm and useless cattle to Gosadans located in wastelands, forests and other out-of-the-way places with grazing facilities.

Thus, it was clear that the objective of the First Plan was mainly to upgrade the milch as well as the draught animals by using better quality bulls, artificial insemination and diseases control.
The outlay for the dairy sector under the Second Five-year Plan was Rs. 21 crores\textsuperscript{11}. The major objective of the second plan was to expand the program of the first plan like Key Village Scheme, Artificial Insemination, Veterinary care etc. to more places. At the same time, it also envisaged the Gaushala Development Scheme for developing gausalas into economic centers for milk production\textsuperscript{12}. Each gausala was provided with certain number of animals with improved breed by the government and was expected to secure an equal number from its own resources. The unserviceable and unproductive cattle of gausala could be sent to the nearest Gosadans. It was proposed to select some gausalas as centers to be developed for cattle improvement and economic centers of milk production\textsuperscript{13}.

Efforts were also made to formulate an all-India breeding policy and accordingly the same was drawn up by the Indian Council of Agricultural Research (I. C. A. R.) with the main objective of increasing milk production through selected breeding. The plan envisaged that the supply of milk to urban areas had become an urgent problem. For this the Plan proposed to organize the urban supply scheme, co-operative creameries and milk drying plants. The general policy suggested was that organized milk producers' co-operatives should be created to supply milk to urban areas. The milk producers should be given incentives in the form of remunerative prices, facilities for artificial insemination, technical advice, veterinary hospital facilities and so on.

The Third Five-year Plan allocated Rs. 36 crores for the dairy sector. From the experience of the first two plans, the Government realized that there was a need for organized support for systematic long-term development in the dairy sector. It was felt that a suitable infrastructure must be evolved to help increase milk production and its availability. Accordingly, the Plan insisted on the establishment of a Dairy Development Department in each state. Again, the policy programs of the third plan emphasized that milk production in the rural areas must be linked with marketing of milk in the urban centers and, for that, milk supply schemes in bigger townships were proposed.
The Third Five-year Plan witnessed a basic shift in the livestock development strategy. However, the third plan proposed to undertake, as an experimental measure, the crossbreeding of Indian milch cattle with exotic breeds in selected areas\textsuperscript{14}. In 1963, the ICAR started a scheme for evolving new breed of dairy cattle by crossbreeding quality cows with Jersey bulls. Later this helped very much in increasing the productivity of milch animals.

The Key Village Scheme was gradually transformed into a basic program for cattle development. It was transferred to the state sector and all direct financial assistance to the scheme from the Govt. of India was discontinued\textsuperscript{15}. This change in financial allocation pattern affected to a large extent the provision of adequate inputs and services to the dairy sector.

When it was realized by the authorities that the cattle development programs of the earlier plans had failed to bring sufficient inputs and there was absence of tie up of production programs with proper marketing system, the authorities adopted an area development approach for cattle development\textsuperscript{16}. They formulated an Intensive Cattle Development Project, main component of which was cross breeding in areas under Key Village pockets that lay in the milk sheds of dairy projects.

On the dairying and milk supply front, despite increased allocation of funds in successive plans the program was not satisfactory. The policy of the Third Plan emphasized that milk production in rural areas be linked up with plants for marketing of milk in the urban centers. It was envisaged that producers’ co-operatives in the rural areas be encouraged to supply and collect milk. The processing and distribution should be organized through milk plants as far as possible on the same producers’ co-operative lines. By the end of 1965, it was obvious that the modern dairy sector was not progressing as expected. On the eve of the Fourth Plan, it was observed that the rate of growth of milk output in the country had remained below the rate of growth of demand for milk\textsuperscript{17}. The slow
growth in milk output was basically because of the Government’s inability to organize milk procurement through co-operatives.

At the same time, there was a success story at Anand in Gujarat. The Kaira District Cooperative Milk Producers Union LTD; Anand which had started with a handful of members in two villages, producing about 250 liters of milk a day in 1946, had such an abundance of milk supply that by 1970 the Union procured approximately 3.25 lakh liters of cow and buffalo milk per day. Their successful operation from 1946 to 1970 had made them the model for dairy development all over India. It was this successful co-operative movement in dairy field at Anand that led to the implementation of India’s largest project for dairy development called 'Operation Flood'.

**Anand Pattern and OF**

The foundation of the Kaira District Co-operative Milk Producers Union LTD (KDCMPUL), popularly known as Amul Dairy, at Anand was laid in 1946 with the blessings of Sardar Vallabhbhai Patel.

In the early 1940’s the Bombay Milk Scheme, a government distribution set up, used to buy milk from milk producers of the Kaira District through milk contractors. The contractors, in turn, hired middlemen for actual purchasing of milk from producers. The private traders had monopolized the milk purchases in the district. The shelf-life of milk being short and there being no other means of selling their milk, producers were compelled to sell their surplus milk to the traders at a very cheap price. The traders also indulged in much malpractice such as low fat estimation, incorrect weighing and delaying payment. When this exploitation continued, the discontented milk producers sought the advice of Sardar Vallabhbhai Patel, the famous freedom fighter. He advised them to form a dairy co-operative, so that they could manage their milk business.

Sardar Patel then sent his deputy Mr. Morarji Desai, to the Kaira district to organize a milk co-operative and a milk producers’ strike, if necessary. Mr. Desai
held a meeting at Samarkha village on January 4, 1946. It was resolved that milk producers' co-operative societies should be organized in each village of Kaira district to collect milk from the producers. All such village co-operatives would federate into a District Union, which would own its milk processing facility. The Government should undertake to buy milk from the Union. If these were not done, farmers would refuse to sell their milk to the traders in Kaira district.

The Government turned down their demand. The farmers went on a milk strike. It lasted fifteen days. Not a drop of milk was sold to the traders. No milk from Anand reached Bombay, and the Bombay Milk Scheme almost collapsed. After fifteen days, the Milk Commissioner of Bombay and his deputy visited Anand, assessed the situation and accepted the farmers’ demand. This marked the beginning of the Kaira District Co-operative Milk Producers’ Union Limited, Anand. It was formally registered on December 14, 1946, with five village co-operatives. With the establishment of Dairy Co-operative Union, the exploitation of milk producers ceased and they started to receive remunerative prices.

The union had no processing facilities in the beginning and they purchased an old idle chilling plant in 1948 when they were handling 5000 liters of milk per day. The number of affiliated village co-operative societies and their producer members kept on increasing. By 1955, the union acquired the necessary machinery from UNICEF (United Nations Children's Fund) for pasteurization, butter and milk powder manufacture, and in 1955-56, milk powder was manufactured from buffalo milk for the first time anywhere in the world. In 1958, they started manufacturing condensed milk from buffalo milk and all products of the union were then sold under the new brand name 'AMUL'.

As the union grew, it also kept on increasing the facilities of providing technical inputs to producers through village co-operatives. An important milestone achieved by Kaira Union was the completion of a project to manufacture balanced cattle feed. The plant was donated by OXFAM under the Freedom from Hunger Campaign of the Food and Agricultural Organization (FAO). It was
formally commissioned on October 31, 1964. The occasion of its inauguration is of particular significance. As impressed with the performance of Anand Pattern milk co-operatives, the then Prime Minister, Sri Lal Bahadur Sastri, who inaugurated the plant, inspired the General Manager of the Union, Dr. V. Kurien, to work for replication of Anand Pattern elsewhere in the country. This is the genesis of National Dairy Development Board (NDDB), Indian Dairy Corporation (IDC) and Operation Flood (OF).

The Anand Union grew rapidly. The union's approach to dairying, integrating milk production, procurement, processing and marketing provided all the required facilities to perform these functions most satisfactorily. Its development was attributed to its producer-members’ cohesion, its strong and honest office bearers, its employment of professional managers and technical staff and favorable government policy.

It was the co-operative structure of the Anand Pattern which had provided the basis for dairy development in the country since 1965, undertaken by NDDB on behalf of Govt. of India under the OF Program. Dr. V. Kurien has rightly pointed out that the contribution of co-operative structure has been of great importance both in creating the market and in supporting our farmers with feed, breeding and veterinary services. According to Dr. Amrita Patel, through assured remunerative price and marketing support, the OF has made the small marginal farmer and landless laborer the kingpin of India’s dairying. The Anand Pattern, the basis of the White Revolution, is acclaimed as a significant phenomenon of our times.

2.1.3. Development under OF

Operation Flood (OF) is the result of an organized attempt directed towards the development of the dairy industry in India. The program has laid emphasis on setting up "Anand Pattern" rural milk producers' co-operative organizations to procure, process and market milk and to provide some of the essential technical
input services for increasing milk production. Today the program covers about 10 million members in nearly 70,000 village societies spread over in 270 districts all across India.

The National Dairy Development Board (NDDB) was set up in 1965 in response to Prime Minister Sastri's call. He wanted the Anand Model of dairy development - with institutions owned and managed by rural producers, which are sensitive to their needs and responsive to their demands - replicated in other parts of the country. However, the process of replication of Anand Pattern could not begin until 1970. In the initial years, NDDB's effort to spread the Anand Pattern could not make much headway. At this juncture surplus conserved milk solids were piling up in most European countries especially in the EEC countries. Dr. V. Kurien, the then Chairman of NDDB saw in it the opportunity of importing the commodities as a gift to be used to generate funds to finance the replication of Anand Pattern all over the country. The program that NDDB formulated to meet this objective was called Operation Flood. This was the first attempt to use food aid for development.

2.1.3a. Operation Flood - Phase 1

The first phase of Operation Flood program (OF-Phase I) started in July 1970. The OF project drawn up by NDDB was proposed by the Govt. of India to the World Food Program (WFP) for commodity assistance in the form of skim milk powder and butter oil, which, on the one hand, would supplement domestic availability and, on the other, provide resources for expanding indigenous supply of milk.

The OF-phase I, involving an investment of Rs. 95.4 crores, was formally launched on July 1, 1970. This was, at the time, the largest dairy development program launched anywhere in the world. The project was originally formulated for five years, but it suffered delays and was, therefore, extended. It was completed on 31st March 1981 and the revised final allocation was Rs. 116.4 crores.
Objectives

Operation Flood-I aimed at the co-operative dairy sector for obtaining a commanding share of the market in the four cities of Bombay, Calcutta, Delhi and Madras. With equal importance, it planned for speeding up dairy development by increasing milk production and procurement in the rural areas, which have links with these four major cities. To feed these cities, milk producers' co-operatives were to be set up on the Anand Pattern in 18 hinterland milkshed districts of ten states surrounding these cities.

Operational Procedure

Under the project, producers' co-operatives were to be set up in rural areas that could supply milk to the four cities. These rural areas extended over 10 states, viz., Punjab, Haryana, Rajasthan, Uttar Pradesh, Bihar, West Bengal, Tamil Nadu, Andhra Pradesh, Maharastra and Gujarat and the Union Territory of Delhi. Of the above ten states to be covered, only Gujarat had Anand pattern milk unions. Therefore, in this State these milk unions were responsible for the implementation of OF-Phase I with the technical guidance of NDDB.

As for the other states where Anand Pattern milk unions did not exist, the implementation of OF required the state governments to establish state-level dairy development corporations for the purpose of promoting, assisting and monitoring milk co-operative societies with technical guidance from NDDB.

Targets and Accomplishment

The OF-Phase I project was completed on 31st March 1981. The major targets of the projects and the pre-project figures are presented in Table-2.1. The important achievements of the project during Phase-I are given in Table-2.2.
Table-2.1 Major Targets of Operation Flood – Phase 1

<table>
<thead>
<tr>
<th>Area</th>
<th>Pre-project</th>
<th>OF-Phase 1 Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban milk marketing: Capacity (lakh lpd)</td>
<td>10.00</td>
<td>27.50</td>
</tr>
<tr>
<td>Throughput(lakh lpd)</td>
<td>9.02</td>
<td>27.50</td>
</tr>
<tr>
<td>Rural dairy plants: Capacity(lakh lpd)</td>
<td>6.60</td>
<td>29.84</td>
</tr>
<tr>
<td>Peak throughput(Lakh lpd)</td>
<td>4.60</td>
<td>27.50</td>
</tr>
<tr>
<td>Farmer families covered(lakh)</td>
<td>10.00</td>
<td></td>
</tr>
</tbody>
</table>

Source: Anand Pattern and OF, An Overview, NDDB

Table-2.2 Achievements of Operation Flood – Phase I

<table>
<thead>
<tr>
<th>Area</th>
<th>Achievements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processing facilities</td>
<td>a) Dairy plants</td>
</tr>
<tr>
<td></td>
<td>b) Chilling centers</td>
</tr>
<tr>
<td>Co-operative orgn.</td>
<td>a) Milkshed covered</td>
</tr>
<tr>
<td></td>
<td>b) Village co-operatives formed</td>
</tr>
<tr>
<td></td>
<td>c) Milk produced</td>
</tr>
<tr>
<td></td>
<td>d) Milk procured</td>
</tr>
<tr>
<td>Technical inputs</td>
<td>a) Cattle feed plant</td>
</tr>
<tr>
<td></td>
<td>b) Jersey bull-mother farm</td>
</tr>
<tr>
<td></td>
<td>c) Frozen semen banks</td>
</tr>
<tr>
<td></td>
<td>d) Village co-operatives with AI facilities</td>
</tr>
<tr>
<td></td>
<td>e) No of inseminations performed</td>
</tr>
<tr>
<td></td>
<td>f) Animal health care</td>
</tr>
</tbody>
</table>

(Source- Anand Pattern and OF- An Overview- NDDB Anand- Dec 1985)

The project made significant progress in its stated objectives. The yearly milk production and per capita availability increased from about 207 lakh tonnes and 107 grams of milk per person per day in 1969-70 to about 315 lakh tonnes and 128 grams of milk per person per day, respectively in 1980-81.

2.1.3b. Operation Flood – Phase II

The success of OF-Phase I clearly demonstrated the replicability of Anand Pattern in other parts of the Country. For achieving development in the dairy sector
the Sixth Plan relied on Operation Flood II. It was contemplated that: “The major program in the dairy sector would be the Operation Flood II project which is expected to cover practically all the states. This project would be implemented through a three-tier co-operative structure with a federation at the apex. Under the project, a national milk grid would be developed to cater for the demand for milk of the four metropolitan cities and all towns having a population of one lakh and above. These dairy programs will provide economic benefit to about 10 million rural families. This coverage would be extended to 15 million families. Thus, OF-Phase II launched on October 2, 1979 aimed to establish a viable industry to serve the nation’s need for milk and milk products.

Objectives

The OF-Phase II was designed to replicate the Anand Pattern up to the third ‘tier’ of co-operative federation of unions, in 25 enlarged milkshed areas throughout the entire Country, and to form a National Milk Grid to even out seasonal and regional imbalances between supply and demand for milk.

Project Financing

OF-Phase II was originally estimated to cost Rs. 485.5 crore. About 95% of the project outlay was to be non-recurring investments. Subsequently, however, the project outlay for OF II was modified to Rs. 273 crore with revised targets. The excess granted fund was to be carried over to OF III.

OF II was to be financed through the sale of recombined milk and direct retailing of donated commodities and also through soft loans of the World Bank, and IDC’s own resources. It was estimated that Rs. 206.40 crore would be generated by recombining skim milk powder and butter-oil, and retailing butter-oil, all obtained as gift from the European Economic Community (EEC) through Food and Agriculture Organization (FAO). Indian Dairy Corporation’s revolving fund of Rs. 89.59 crores would mainly come from the repayment of the OF-Phase I loans
and the funds generated from recombination of commodities other than those donated by the WFP\textsuperscript{24}.

**Operational Procedure**

The State Dairy Federations, the implementing agencies for each state’s dairy development program under OF-Phase II, were and responsible to prepare dairy projects. While the responsibility for implementation of the program rested with the State Dairy Federations, the NDDB provided services to the Federations for the implementation of the program. It assisted the project authorities in carrying out surveys and studies for planning the projects and setting up dairy and cattle feed plants on turn-key/consultancy basis. The NDDB has also been deputing spearhead teams for organizing milk producers’ co-operatives, and organizing manpower development programs.

**Targets and Accomplishments**

Operation Flood-Phase II completed on 31st March 1985. Against the total original project outlay of Rs. 485.5 crore, the fund generation was Rs. 515.35 crore, and as against the Phase II approved outlay of Rs. 273 crore, the expenditure was Rs. 277.17 crore. Phase III of the program would be implemented during the Seventh Five-year Plan period and the unspent amount would be carried forward to it. At the end of Phase II, the program was in operation in 136 milksheds in the country, and had covered over 290 large, medium and small towns under the organized milk marketing. Table 2.3 shows the achievements of the program.

Major sub-projects taken up for implementation include the organization of village milk co-operatives for increased milk procurement, provision of inputs for enhanced milk production and build-up of milk processing facilities in rural milksheds. These have resulted in increasing yearly milk production to 380 lakh tonnes in 1984-85 and per capita milk consumption to approximately 142 g/day.
<table>
<thead>
<tr>
<th>Particulars</th>
<th>Target</th>
<th>Achievement as on March 1985</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Anand Pattern (AP) Village co-operatives, No</td>
<td>29,000</td>
<td>34,523</td>
</tr>
<tr>
<td>2. AP Village co-ops under AI, No.</td>
<td>8,000</td>
<td>7,543</td>
</tr>
<tr>
<td>3. Milk producers’ families covered, lakh</td>
<td>43.8</td>
<td>36.31</td>
</tr>
<tr>
<td>4. Milch animals under co-operative ambit, lakh</td>
<td>52.2</td>
<td>54.46</td>
</tr>
<tr>
<td>5. Annual milk production (1984-85), lakh tonnes</td>
<td>380</td>
<td></td>
</tr>
<tr>
<td>6. Per capita milk availability (1984-85), g/day</td>
<td>142</td>
<td></td>
</tr>
<tr>
<td>7. Average milk procurement, lakh lpd</td>
<td>55.3</td>
<td>57.84</td>
</tr>
<tr>
<td>Peak milk procurement, lakh lpd</td>
<td>71.9</td>
<td>78.98</td>
</tr>
<tr>
<td>8. Urban milk marketing, lakh lpd</td>
<td>43.00</td>
<td>35.00</td>
</tr>
<tr>
<td>Capacity throughput (1984-85), lakh lpd</td>
<td></td>
<td>50.11</td>
</tr>
<tr>
<td>9. Rural dairy plants capacity, lakh lpd</td>
<td>76.00</td>
<td>87.75</td>
</tr>
<tr>
<td>Peak throughput</td>
<td></td>
<td>78.85</td>
</tr>
<tr>
<td>10. Milk powder manufacturing capacity, tonne/day</td>
<td></td>
<td>507.50</td>
</tr>
</tbody>
</table>

(Source: Anand Pattern & OF, NDDB)

There has been an overall development in dairying as observed from the above table. In addition to the appreciable achievements in milk procurement and processing fronts, the NMG, the national milk marketing network, has consolidated its role.

2.1.3c. Operation Flood – Phase III

The third phase of Operation Flood aimed at the consolidation of the gains of earlier phases. The main focus of the program was on achieving financial viability of the milk unions/state federations and adopting the salient institutional characteristics of the “Anand Pattern” co-operatives.

As stated earlier, the major emphasis was to consolidate the achievements gained during the earlier phases by improving the productivity and efficiency of the co-operative dairy sector and its institutional base for its long-term sustainability. Investments in OF-III were to be focused on strengthening the institutional management aspect of dairy co-operatives at its various levels to establish financially strong farmer-owned and managed organizations.

The OF-III has also made provision for productivity-enhancement inputs and institutional strengthening in the form of training, research, market promotion,
monitoring and evaluation. Particular emphasis was placed on institutional and policy reforms.

Efforts were to be made to expand infrastructure in all major markets, linking them to milksheds through NMG to ensure year-round stable milk supply. Marketing thus should become the driving force to improve procurement and strengthen the financial viability of the unions.

**Project Resources and Outlay**

OF-Phase III was to be financed with NDDB’s own resources and external assistance from World Bank and EEC. Though the total outlay of the Phase III was estimated to be Rs. 681.29 crores, the actual outlay for the period 1987-96 was Rs. 1,303.1 crores (Table-2.4). This total outlay was funded by a World Bank credit loan of Rs. 872.8 crores, Rs. 222.6 crores of food aid (75,000 tonnes of milk powder and 25,000 tonnes of butter-oil) by the EEC and Rs. 207.7 crores by NDDB’s own resources.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Rs. (crores)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDDB’s own resources</td>
<td>207.7</td>
</tr>
<tr>
<td>External assistance</td>
<td></td>
</tr>
<tr>
<td>World Bank</td>
<td>872.8</td>
</tr>
<tr>
<td>EEC</td>
<td>222.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,303.1</strong></td>
</tr>
</tbody>
</table>

(Source: Anand Pattern & OF, NDDB)

**Targets and Achievements**

Through Operation Flood, new industrial activity has made its appearance on the rural scene, creating technological consciousness as well as awareness of the principles of hygiene. Consequently, an urban - rural continuum has started evolving. Some 75 per cent of OF beneficiaries are landless, marginal and small farmers, and they too mostly women. Dairy income is often their only regular cash flow. Dairying has been transformed into a core economic activity. Operation
Flood is quite possibly India’s largest rural development project as well as the world’s biggest dairy development program.

The major emphasis of OF-III was to consolidate the achievements gained during the earlier phases by improving the productivity and efficiency of the co-operative dairy sector and its institutional base for its long-term sustainability. The focus was on achieving financial viability of the milk unions/state federations and adopting the salient institutional characteristics of the “Anand Pattern” cooperatives. Thus, investments in OF-III were focused on strengthening the institutional management aspect of dairy cooperatives at its various levels to establish financially strong farmer-owned and managed organizations. The targets and achievements of OF-III are given in Table-2.5.

Table-2.5 Targets and Achievements of OF-Phase

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Targets</th>
<th>Achievements 1995</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of milksheds</td>
<td>170</td>
<td>170</td>
</tr>
<tr>
<td>Number of Dairy Co-operative Societies (000)</td>
<td>70.00</td>
<td>69.60</td>
</tr>
<tr>
<td>Number of farmer members (lakh)</td>
<td>100.00</td>
<td>90.00</td>
</tr>
<tr>
<td>Average milk procurement (lkpgd)</td>
<td>115</td>
<td>102</td>
</tr>
<tr>
<td>Peak milk procurement (lkpgd)</td>
<td>140</td>
<td>116</td>
</tr>
<tr>
<td>Processing capacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural dairies (llpd)</td>
<td>193.7</td>
<td>167.5</td>
</tr>
<tr>
<td>Metro dairies (llpd)</td>
<td>72.40</td>
<td>52.30</td>
</tr>
<tr>
<td>Milk marketing:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metro dairies (llpd)</td>
<td>38</td>
<td>35</td>
</tr>
<tr>
<td>Other cities and towns (llpd)</td>
<td>62</td>
<td>59</td>
</tr>
<tr>
<td>Milk powder production (000 tonnes/year)</td>
<td></td>
<td>195</td>
</tr>
<tr>
<td>Technical inputs:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of AI Centers (000)</td>
<td>16.50</td>
<td>16.28</td>
</tr>
<tr>
<td>Number of AI done (lakh)</td>
<td>39.5</td>
<td>37.9</td>
</tr>
<tr>
<td>Cattle feed capacity (000 tonnes/day)</td>
<td>5</td>
<td>4.9</td>
</tr>
<tr>
<td>Investments (RS crores)</td>
<td>1303.1</td>
<td>896.21</td>
</tr>
</tbody>
</table>

(Source: Anand Pattern & OF, NDDB and Dairy India-1997)

2.2. Current Progress

Operation Flood is now a movement of some 91.70 lakh rural families (Table-2.5), who are the primary members of the milk co-operatives and who, by their income from milk, are progressively able to improve their standard of living. The basic reasons for the success of OF program are the efficient milk production and the involvement of milk producers in setting up their own organizations for milk production enhancement, procurement, processing, and marketing. Through
their effort the OF program has made considerable progress in many fields like 
milk production, procurement, processing, marketing, technical inputs, 
management, infrastructure facilities, employment etc. Progresses made in some 
major fields are mentioned in Table-2.5.

2.2.1. Milk Production and Procurement

Milk production is largely the domain of the economically weaker sections 
of the rural population, and they stand to benefit more from Operation Flood. The 
anticipated production of milk in 1998-99 is 78 million tonnes with an expected 
growth rate of 5.63 per cent. The availability of milk per head during the same 
period is expected to be 220 grams per day as given in Table-2.6.

Table-2.6 Progress of Dairy Sector

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk production ---1998-99(Anticipated</td>
<td>mill. tonnes</td>
<td>78.00</td>
</tr>
<tr>
<td>Annual growth rate of milk production (1996-2000)</td>
<td>Per cent</td>
<td>5.63</td>
</tr>
<tr>
<td>Per capita availability (1998-99</td>
<td>gms/day</td>
<td>220.00</td>
</tr>
</tbody>
</table>

(Source: Dairy India-1997)

Both during the period of implementation of OF and after, more and more 
farmers were becoming members of the milk producers’ co-operative societies. By 
March 1995, about 69,900 dairy co-operatives had been organized in 170 
milksheds. By December 1997 this setup had started procuring 151.8 lakh kg of 
milk per day and marketing about 109.4 lakh liters of milk per day in over 600 
cities and towns as shown in Table-2.7.

Table-2.7 Progress of Dairy Sector Under OF

<table>
<thead>
<tr>
<th>Items</th>
<th>units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unions (1997)</td>
<td>numbers</td>
<td>170.00</td>
</tr>
<tr>
<td>Anand Pattern DCS (1994-95)</td>
<td>thousands</td>
<td>69.90</td>
</tr>
<tr>
<td>Farm Families Covered(1994-95)</td>
<td>million</td>
<td>9.00</td>
</tr>
<tr>
<td>Average milk procured (1997)</td>
<td>lakh kg per day</td>
<td>151.80</td>
</tr>
<tr>
<td>Milk marketing (1997)</td>
<td>lakh lit per day</td>
<td>109.40</td>
</tr>
<tr>
<td>Chilling capacity (1997)</td>
<td>lakh lit per day</td>
<td>73.47</td>
</tr>
<tr>
<td>Processing capacity(1997)</td>
<td>lakh lit per day</td>
<td>264.69</td>
</tr>
<tr>
<td>Powder production capacity(1997)</td>
<td>metric tonnes/day</td>
<td>990.00</td>
</tr>
</tbody>
</table>

(Source: Dairy India-1997)
2.2.2. Processing Facilities

Milk conservation facilities have an important role in balancing seasonal fluctuations in production. The experience of both a good and a bad year has brought out the need to provide buffer stocks of conserved milk solids. Processing and conservation facilities must not only precede procurement build-up, but must be at a higher level than any anticipated peak procurement. This alone can ensure the members’ confidence in the co-operatives. Through the Program a liquid milk chilling capacity of 73.47 l/lpd, a milk processing capacity of 264.69 l/lpd and milk drying capacity of 990 MTPD have been established.

2.2.3. Productivity and Technical Inputs

A vide variation in milk productivity per animal exists among different countries. Against the world average of 2,038 kg per lactation, the highest of over 9000 kg is in Israel, followed by USA (7,078), UK (5,462) and Australia (4,451). At the other end are China (1,541), India (987) and Pakistan (893)\textsuperscript{27}. However, these data are not comparable due to diverse systems of milk production followed in different countries, ranging from grain-based intensive production in developed countries to low-input/low-output crop-residue approach in developing countries. In India, milk yield varies widely. At one end are herds in institutional farms, reared under modern management, with an average yield of 2000-3000 kg. At the other end are village-reared dairy animals, their output averaging just 400-800 kg. This low productivity is due to the gradual deterioration from general neglect over centuries and the consequent rise in the population of non-descript cows and buffaloes. Chronic shortage of feed and fodder coupled with their poor nutritive value also leads to low productivity as well as poor fertility of dairy animals.

The present low level of milk yield cannot be expected to change dramatically in the near future, given the existing mixed-farming system. However, within these constraints, there is adequate scope for enhancing animal productivity by providing better breeding, nutrition and veterinary care.
Efforts have been made through a Technology Mission on Dairy development to optimize the use of available inputs and infrastructure facilities established through the OF program and the State Governments. Animal health care, breeding facilities and cattle feeds are the inputs most readily accepted and adopted by rural milk producers.

For improving the productivity of dairy cattle and thereby milk production, the OF program provided animal health and breeding facilities. Nearly 40,313 Dairy Cooperative Societies (DCS) had been covered with the animal health program, while 16,280 DCS were provided with artificial insemination facilities and 37.9 lakh AI had been performed (Table-2.5). Similarly, the AI network of the State/Central Government was linked to the co-operatives. Again, semen production stations strengthened and in the areas where AI services cannot be reached, arrangements were made to provide quality bulls for breeding purposes.

The crossbred cow is emerging as an important dairy animal of the nineties. Its milk yield surpasses that of the buffalo. The good news about crossbreeding is that it is getting popular. Even though only 10 per cent of all cows-in-milk are crossbred, their output is estimated at about 22 per cent of the total cow milk production. The first extensive and systematic cross breeding program, based on frozen semen, was initiated in 1963 in northern Kerala under the bilateral Indo-Swiss Project which was a success.

The success of crossbreeding initiated the strengthening of bull mother farms under the OF for producing exotic and cross breed bulls. A bull-calf-rearing program has also been undertaken to speed up the availability of superior breeding bulls for AI and natural services.

In the disease control front, all the new DCS formed under the Program had been covered with the first-aid program and efforts were made to improve the training and supervision skills of the village level first-aid workers.
Cattle Feeds

Cattle feed is another major input item that increases the productivity. New types of cattle feed, bypass protein feeds and urea-molasses blocks, are gaining in popularity for healthy growth of and higher yield from dairy animals. Today India has an organized feed compounding industry. In the past 30 years, the annual production of cattle feed by the organized sector has gone up to about 1550 thousand tonnes from 14.4 thousand tonnes (Table-2.8).

Table-2.8 Production of cattle feed by the organized sector, 1964-95

<table>
<thead>
<tr>
<th>Year</th>
<th>Cattle feed Production (000 tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>25.0</td>
</tr>
<tr>
<td>1970</td>
<td>125.4</td>
</tr>
<tr>
<td>1980</td>
<td>549.9</td>
</tr>
<tr>
<td>1990</td>
<td>1327.5</td>
</tr>
<tr>
<td>1994-95</td>
<td>1442.8</td>
</tr>
<tr>
<td>1995-96</td>
<td>1550.0</td>
</tr>
</tbody>
</table>

Source: Dairy India 1997

All the OF programs have given sufficient importance to cattle feed production. By 1997 a cattle feed production capacity of 5,205 metric tonnes per day had been established and 25,035 societies marketed about 61,842 metric tonnes of cattle feed to their farmer members (Table-2.9). Considering the rate of increase in cattle feed utilization several new plants have been setup and the existing ones expanded. Farmers have now increasingly adopted the bypass protein feed, developed by NDDB. This increases the protein conversion efficiency of the cattle feed by 33%\textsuperscript{28}. In 1997, about 19,788 metric tonnes of bypass feed was produced and marketed to the farmer members by 5,365 co-operative societies (Table-2.9).

The treatment of straw with urea, a cheap and simple technique to raise the nutritional level of the straw, is being promoted. Feeding of urea-treated straws reduces the concentrate requirement by 33%, minimizes wastage of straw and improves animal health. These technologies have implications on lowering the cost of milk production and, thereby, maximizing returns to farmers\textsuperscript{29}. 
The program also envisaged schemes for improvement of fodder availability. The OF developed about 105 fodder seed farms in 1992-93 and the production of fodder seed was about 360 tonnes during the same period.

<table>
<thead>
<tr>
<th>Table-2.9 Progress of Dairy Inputs Under OF</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Items of Input</td>
<td>Quantity</td>
</tr>
<tr>
<td>Cattle feed plant capacity (1997) Metric tonnes/day</td>
<td>5,205</td>
</tr>
<tr>
<td>Cattle feed produced (1997) Metric tonnes</td>
<td>61,842</td>
</tr>
<tr>
<td>Societies Marketing Cattle feed (1997) Nos.</td>
<td>25,035</td>
</tr>
<tr>
<td>Bypass feed produced (1977) Metric tonnes</td>
<td>19,788</td>
</tr>
<tr>
<td>Societies marketing bypass feed (1977)</td>
<td>5,365</td>
</tr>
<tr>
<td>Fodder seed production (1994-95) tonnes</td>
<td>360</td>
</tr>
<tr>
<td>Fodder seed farms (1992-93) Nos.</td>
<td>105</td>
</tr>
</tbody>
</table>

(Source: Dairy India-1997)

2.2.4. Marketing

It is an accepted fact that financial viability and sustainability of the co-operative structure would depend upon more efficient marketing and distribution of milk and milk products by developing a suitable product mix.

India’s dairy market is multi-layered, shaped like a pyramid with the base made up of vast market for low-cost milk. The narrow tip at the top is a small but affluent market for western type milk products. The bulk of the demand for milk, however, is among the poor and middle class whose individual requirement is small. The effective milk marketing is largely confined to this section in urban areas. It is estimated that 50% of the total milk produced is consumed here. In the nineties, the urban population is expected to increase by more than 100 million to touch 364 million in the year 2000- a growth of about 40%. The expected phenomenal rise in urban population would be a boon to Indian dairying. Presently, the organized sector—both co-operative and private—and the traditional sector cater to this market. The market size of major dairy products handled by the organized sector is shown in Table-2.10. All these statistics show that there is wide scope for the organized sector in milk and milk products marketing both in rural and urban areas.
Marketing facilities for milk and milk products have been expanded considerably by the end of Phase III. The existing rural and metro dairies have marketed 109.40 lakh liters per day in 1997 (Table-2.7). Out of this the metro dairies marketed about 49.3 llpd and the balance 60.1 llpd were marketed by other dairies under the OF. Estimated local sales by the DCS were about 4.5 llpd. As the fluid milk market expands through the co-operative sector, it has become necessary to progressively provide the consumers greater choice and convenience in terms of packing. With this objective, the co-operatives were marketing milk in a variety of packages and qualities. The Co-operative structure of OF has made considerable progress in the marketing of liquid milk as well as other milk products (Table-2.10). However, the organized sector altogether deals in only 18% of the total marketable surplus of milk available in the urban areas. Of the 18%, only 11% are handled by the co-operatives and private parties market the balance. The major part of the total marketable surplus of milk (82%) is marketed by the traditional sector.

Apart from liquid milk the organized sector markets other major dairy products like branded traditional sweets, ghee, baby food, skim milk powder, ice cream, butter etc (Table-10). The development of process technologies and the manufacture of quality dairy products in the organized sector will benefit both milk producers and consumers. With this objective the technology for manufacturing *shrikhand, gulabjamun, peda, lassi, mishti doi, rasagolla, paneer, calakand, khoa*
and flavored milks developed by the Applied Research and Development Group of the NDDB has been progressively transferred to the co-operative dairies to enable them diversify their marketing efforts.

According to Dr. R.P. Aneja and B. P. S. Puri, two key elements of marketing strategy for 2000 AD are: (1) focus on strong brands and (2) 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.

Operation Flood has been able to modernize the dairy sector of India to a level from where it can take off to meet not only the country’s demand for milk and milk products in the next century but can also exploit global market opportunities. According to Dr. V. Kurien the General Agreement on Tariff and Trade (GATT), leading to the creation of World Trade Organization (WTO), can be a blessing in disguise for the Indian dairy industry as it will offer opportunities to sell surplus milk products in the global market. The countries that are dominating the world dairy export today are giving heavy subsidies (40 to 60 per cent) to their producing farmers. A reduction of more than 10 per cent in the producer subsidies will produce enormous shake-up in the American and European dairy industries. There are only two major producing nations in the world that do not subsidize their dairy farmers- New Zealand and India. Thus, our prices, which are already competitive, will become increasingly attractive in the world dairy market.

2.2.5. Employment Generation

The Co-operative structure of the OF Program helped in spreading the many benefits of dairy development to the rural poor. Dairying has now emerged as an important income-generating activity and a source of mass employment in rural areas. In terms of employment potential, the Planning Commission, after evaluating the findings of the NDDB and National Commission on Agriculture, has estimated that the animal husbandry sector even with the existing stock could
generate employment equivalent to 86 million person years, inclusive of employment in the processing and marketing of milk and milk products\(^33\).

According to the National Sample Survey the average annual growth rate for employment in the livestock sector during the period 1972-73 to 1987-88 work out to 4.1 per cent as against 1.1 per cent for the agricultural sector as a whole. Further, the employment in animal husbandry sector and related industries was 12.4 million in principal status and another 7 million in subsidiary status. The same was 14.27 million in principal status and 8.06 million in subsidiary status in the year 1991-92. The annual average growth rate during the period 1987-88 to 1991-92 is about 3.7 per cent. Further, the growth rate of employment is expected to be 3.4 per cent in 1992-93 and 4.8 per cent in 1993-94\(^34\).

2.2.6. Institutional Management

In Indian dairying, three competitive institutional structures are co-operatives, government departments and the private sector. The first two, when functioning efficiently, may lead to social and economic gains but lose out on global competitiveness. The private sector, on the other hand, may lead to rapid growth and modernization but sacrifice employment and livelihood. It is important to recognize a trade-off between these two sectors so that the institutional structure is not only for maximizing ‘local’ efficiency- as, for instance, in the value-adding segments-but for efficiency, equity and sustainability at the level of the society as a whole.

In many studies comparing the performance of co-operative and private operators the aspects which tilt the balance in favour of private operators are efficiency, good management and competitive advantage. In an analytical study of the competition between co-operatives and private sector in Punjab, it is found that private operators in organized as well as non-organized sectors build competitive advantage\(^35\).
In a similar study, the comparative performance of co-operative and commercial dairies in milk procurement and marketing in western Uttar Pradesh, found that co-operatives suffered heavily on account of centralized procurement and pricing controlled by the State Federation. It prevented each district co-operative union from responding vigorously to its unique competitive environment; overstuffed, inefficient workforce and the resulting high overheads; absence of commercial orientation in the Board and management; and extremely high cost of input programs.

It is found that the private sector had the advantage of flexibility in pricing and in business policy. Private operators spent nothing on inputs, their overheads were very low and their credit-based tie-ups with milk supply contractors and producers were highly effective and beneficial to them. It is also found that the private unit was clearly better managed and scored over the co-operative in all departments.

The reasons for poor management performance in the cooperative sector were varied; in most cases, decision making on key issues like procurement and sale pricing, retailer commission, product mix, etc. was far too centralized and no management experts were involved in such decision making. In many states government policy designed to strengthen co-operatives worked against them. Most importantly, compared to commercial dairies as well as unorganized sector operators, co-operatives seemed devoid of the drive to compete and to present good business performance.

The basic premise underlying OF was that if farmers of Gujarat could, on their own, replicate a successful structure, it should be possible for other States to carry out such replication with even greater success. But this had not happened in many states because of vitiated bureaucratic set up. When the Dairy Development Corporations established in many states to implement the OF program were converted into co-operative federations under the insistence of NDDB, the change was made only in name; the essentially bureaucratic character of the erstwhile
corporation remained. In many States, effective control was still wrested by the bureaucracy and the IAS Managing Director of the Federation rules the roost in the State’s dairy co-operative structure.

Even though co-operative dairying has spread the many benefits of this sector it is not without its share of constraints. Some of the weaknesses, strengths and opportunities listed in an analysis made in the dairy farm sector are:

2.3. Weaknesses in Dairy Sector

- Inability to feed cattle adequately throughout the year remains the most widespread technical constraint to higher milk yield.
- Quality dairy animals are in short supply. Artificial insemination service for breeding better cattle has only limited coverage. As a result, there is little control over milk yield.
- The animal health cover is getting increasingly neglected. In many states, over 70-80 per cent of the veterinary budget is used up for establishment expenses, with little left for medicines and other supplies.
- Limited marketing support handicaps rural milk producers seriously. Urban milk supplies largely come from major milkshed districts. Woes of bad roads and inadequate transportation facilities make milk procurement problematic and, as a result, dairy producers in remote areas are neglected.
- Limited investment in setting up or expanding milk procurement network is another bottleneck. The rapid expansion in milk processing capacities has not kept pace with production and procurement.
- The immediate problem of Indian dairy industry is not just shortfall in milk availability, but poor infrastructure for transporting, processing and distributing rurally-produced milk to major consumer centers in urban areas. Improvement in raw milk by its chilling and refrigerated transport is vital for marketing quality products.
• The rural women, an invisible partner, need access to training in modern cattle management to maximize returns. Timely credit is also needed to purchase feeder/fodder and health care and other inputs.

2.4. Opportunities in Dairy Sector

New initiatives and investments to strengthen the infrastructure in animal production would lead to the modernization of this long neglected sector. It also holds promise to transform the quality of life of those most neglected in rural India. Other opportunities include:

• India has been described as a “slumbering giant of the international dairy trade”. For India, GATT offers exciting prospects. With the reduction in heavy subsidies that support dairy producers in the West, India’s low-cost milk will become price competitive. Another plus point is India’s geographical location, surrounded by milk-deficit countries in Asia, the world’s fastest growing market for dairy products.

• The mass production of indigenous milk-based sweets in modern dairy plants can tap the growing demand for them. With 150 million NRIs overseas, the scope for their export is promising.

• There is phenomenal scope for innovation in product development, packaging and presentation. Value-added products like shrikhand, ice creams, flavored milk, dairy sweets etc. give ample opportunities for market expansion and development including brand building.

• Vast scope exists for higher milk yielding through better use of crop residues and by-products by upgrading them. Emphasis must be on technologies that are simple, low-cost and easily adoptable to increase their nutritive value. Some economic incentives are needed for farmers to go in for better feeding.

• Similarly, paying attention to animal health care would minimize the economic losses caused by many major cattle diseases such as rinderpest, mastitis and FMD.
2.5. Threats to Dairy Sector

Dairying is also facing threats from many quarters. These include:

- A large cattle population-200 million cattle and 76 million buffaloes graze on uncultivated lands, forest areas and common property resources. This imposes a heavy social cost, leading to degradation and denudation of land and loss of natural resource base.

- Delicensing has checked the flow of investment by co-operatives in procurement and related infrastructure in their milkshed districts. It has also affected extension services for enhancing milk production.

- The high cost of credit is another adverse factor that reduces the viability of dairy projects.

The year 1996 marked the termination of Operation Flood III, funded by World Bank, EEC food aid and internal resources of NDDB. Even though the threats and weaknesses challenge the long-term viability of co-operatives, the structure enjoys some important competitive advantages that offset some of the problems faced. The large investment that has already been made in developing the co-operative structure in dairy industry makes it imperative that a fourth phase of Operation Flood focus on helping co-operatives to capitalize on their strengths while dealing systematically with the challenges that they face.
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