
UNIT 1 DAIRY DEVELOPMENT IN INDIA

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1.0 OBJECTIVES

After reading this unit we shall be able to:

- 2/21 state the history of dairy development in India.
- 2/21 indicate the various agencies viz. the Government, NGO's and International agencies, which have contributed to the development of dairying and animal husbandry in India.
- 2/21 outline the various Government run projects for dairy development.
- 2/21 specify the contribution of Cooperative, NDDDB and the Operation Flood (OF) in increasing the production and per capita availability of milk.
- 2/21 give the present position of dairying in the country.

1.1 INTRODUCTION

Agriculture in India can be regarded as the fulcrum around which the fortunes of entire economy revolve. Agriculture accounts for 22% of the GDP and provides livelihood to 58% of the country's population. The livestock sector contributes 6.5% to the total national income (Economic Survey, 2003-04).

The origin of livestock wealth is as old as the evolution of human society. In fact this living wealth and the human society are inter-dependent. There is no denying

the fact that livestock wealth apart from being the main source of national wealth is a tool of economic prosperity especially in country like India. The union and state Government in India attach great importance to dairy development as an instrument of promoting socio-economic development of rural people, particularly the poor, landless labour and other down trodden people living below the poverty line. Milch animal rearing is directly encouraged through various dairy development programmes, government subsidy and institutional credit at subsidized rates of interest for the purchase of animals, construction of sheds and fodder, etc. The present status of livestock in general and the animal husbandry and dairying in particular has emerged out of age-old development activities. To have a clear cut idea, the dairy development activities can be studied in three phases *viz.*, the Pre-plan or Pre-Independence Period, 1969-70 and post 1970.

1.2 DAIRY DEVELOPMENT IN THE PRE-INDEPENDENCE PERIOD

The history of government intervention in the animal husbandry and dairying can be traced back to the later part of 19th century, when the British troops were inducted in India. They were unable to digest the poor quality of milk. The responsibility of supplying the fresh and quality milk rested with the quarter master general. On his intervention and to meet their daily requirement of milk, various military dairy farms were set up in different parts of the country. The first such attempt to set up a military dairy farm was made in 1891 at Allahabad.

In 1920, the post of Imperial Dairy Expert was created to organize the Indian dairying on sound footing. Prior to that, the entire work of the dairy research and development was being carried out by the Imperial department of agriculture. In 1922 and 1923, diploma in dairying was started at Bangalore and Allahabad, respectively.

Dr. N. C. Wright, Director, Hannah Research Institute, Ayr. (Scotland) was invited to India in 1936 to examine the progress of dairying and to recommend as to how its tempo could be increased. He submitted his report in 1937 and recommended the appointment of Director of Dairy Research, which however was appointed 15 years later after independence in 1952. He drew most of his recommendations from the report of Royal Commission of agriculture and recommended - (i) the grading of the present cattle by better breeding with selected indigenous animals for the production of pedigree animals, for distribution to villagers, for carrying on researches on animal nutrition and for doing propaganda among the villages in the clean handling of milk and milk products. (ii) Setting up a new Dairy Research Institute close to Delhi for specialized research in various fields like Dairy Bacteriology, Chemistry, Technology and Husbandry. (iii) Utilizing existing institute at Bangalore and Anand as regional stations. (iv) Introducing investigations of dairy problems in all agriculture colleges.

An expert cattle committee appointed by the Government of Bombay in 1938 gave their recommendations on (i) cattle improvement and milk production in villages, (ii) milk production and processing, and (iii) transport of milk products and distribution to consuming areas.

National Planning Committee appointed in 1938 under the chairmanship of Pt. Jawahar Lal Nehru had also an impact on dairy development. The sub committee on animal husbandry and dairying reported that (i) There is a considerable scope of expansion in dairy industry and its retail business and as such to meet the dietic needs it must be stepped up, (ii) Development of cooperative societies for production and consumption of dairy produce, (iii) Mechanized dairy farms to substitute existing farms, (iv) Education and higher research, (v) Make cattle fodder and feed adequate.

For the development of dairy cattle, various projects were taken to improve milk production. Bulls were supplied to local bodies and rural areas but the onset of world war intervened and staggered them. After the war, these were again started. To control and develop dairy trade a major project on cooperative dairying was initiated. Three types of co-operative societies viz. milk consumers cooperative societies, milk distributors co-operative societies and milk producers co-operative societies were started. Milk consumers societies were taken up at Burnpur and Allahabad (1943). Among milk distributive societies, the Radha Swami Educational Institute, Dyal Bagh Agra was quite popular. Prominent Milk Production Societies set up were Kaira and Allahabad (1945), Anand (1946) and Banaras, Meerut, Kanpur, Nainital (1949-50). All these societies made a very significant contribution in dairy development.

During this period, many dairy projects like greater Bombay milk scheme, Kaira District Cooperative Milk Union Ltd. Anand, Polson Ltd., Talankhery Co-operative Dairy Society Nagpur, Federation of Milk Union, Calcutta, Lucknow Cooperative Milk Supply Union, Madras Milk Supply Union, Madras, Kaventers Dairy and Ksheera Kshetra came into existence.

1.3 DAIRY DEVELOPMENT FROM 1947-70

After independence too, the major objectives and how to achieve them remained almost the same as in Pre-Independence era. After independence, the Govt. of India, however realized to make a concerted effort to increase the milk production in the rural areas. To achieve these objectives, the efforts were made to develop the dairy industry in three sectors viz. the Government/Public Sector, Non-Government Organisations (NGO's) and MNCs.

i. Government Projects

In the Public Sector, three major schemes viz. Community Block Development Scheme, Key Village Scheme and Intensive Cattle Development Programme were launched which are being discussed below: The total outlay on animal husbandry and dairying during the period (First Plan, 2nd plan, 3rd plan and three annual plans) was Rs. 235.93 crores, but the actual expenditure was only Rs. 186.23 crores (79%). The percentage share in the outlay on animal husbandry and dairying was 63% and 37% respectively, while expenditure in the respective categories was 57% and 47%.

(a) Community Block Development Programme.

To achieve social and economic transformation of India, which was identified as the major objective of our five year plans, Community Block Development Programme was started in 55 selected blocks of the country. The importance of the project could be gauged by the fact that the project was launched from Alipore Block, near Delhi by the then Prime Minister of India Pt. Jawahar Lal Nehru on Oct. 2, 1952. The major activities undertaken in the project were in the field of (i) Agriculture, (ii) Animal husbandry, (iii) Irrigation, (iv) Communication, (v) Health, (vi) Education, (vii) Supplementary employment, (viii) Housing, (ix) Training and (x) Social welfare.

The Block Animal Husbandry Officer was appointed in each block to look after the animal husbandry programmes aimed at development of cattle by scientific breeding and disease control. Each block had a network of artificial insemination centers, where local cattle were served with quality semen of proven pedigree sires. By the end of 1968, the strength of the community development blocks went up to 52,651. In addition there were 489 Tribal Development blocks.

(b) Key Village Scheme

Key Village Scheme, a comprehensive and integrated programme of cattle improvement in the country, was launched during the First Five Year Plan. In the

project, each key village was a compact unit of contiguous villages having a population of about 500 adult cows and or buffaloes. The technical programme of cattle development included:

- ^{2/21} designing a sound breeding policy for each state.
- ^{2/21} enacting the livestock improvement act and the control of contagious diseases among cattle.
- ^{2/21} establishment of Artificial Insemination Centers.
- ^{2/21} advising the cattle breeders to solve cattle breeding problems by implementing:
 - a) Castration of all unapproved bulls and breeding either by artificial insemination or by good quality bulls.
 - b) Protection against contagious diseases and provision of first aid facilities for sick animals.
 - c) Advise for better feeding
 - d) Provision of better marketing facilities.
 - e) Organization of cattle shows and calf rallies.

Regarding the progress of the project by 1959-60, a total of 3,61,064 artificial inseminations and 92,105 natural services were performed, which covered almost 25% of the population. In the key village centers, a total of 1473 bulls for AI and 193 bulls for natural service were maintained and about 1.37 lakhs scrub bulls were castrated.

(c) Intensive Cattle Development Project

Key village scheme could not bring about an appreciable impact since it could cover only about 6% population and the good work done in the area was negated by the vast area not covered by the project. In the year 1964, another ambitious project known as Intensive Cattle Development Project, which is similar to the package programme in agriculture and is regarded as an important instrument to increase milk production through intensive and integrated use of all required inputs was launched.

Each ICDP had been planned to cover one lakh cows or buffaloes of breedable age with the facilities of a Central Semen Bank, four regional A.I. centers and 100 stockman centers. Though on the eve of the fourth plan, the total number of ICDP's were 31, but this went on increasing and as per the information available the number increased to 124 by the end of 1992-93.

ii. Non Government Organizations

Not only the Government, but many Non-Government organizations being run by various philanthropic trusts and religious organizations are helping a lot in the development of animal husbandry and dairying in India, however these organizations were provided with financial support from the central and state Governments. Some of the prominent organizations working in the field are being discussed below:

(a) Gosadan Scheme

Gosadan Scheme was launched primarily with the objective to segregate old, infirm, unproductive, useless cattle so as to control indiscriminate breeding and relieving pressure on the limited resources of fodders and feeds. Gosadan are generally located either in remote forest areas or waste lands. In the first plan period, it was proposed to set up 160 Gosadans with 3,20,000 cattle. In the 2nd and 3rd plan too, 60 and 23 Gosadans were proposed to be set up, but the accomplishment fell short of targets. In the first plan only 25 Gosadans could be established.

(b) Goshala and Pinjrapoles

Goshalas and Pinjrapoles are the institutions of charity established with the close cooperation of public. The major objective of these institutions was to house

unserviceable and unproductive animals. There was a clear cut understanding that cows, calves and bullock will be kept in Goshalas while the other animals will be housed in Pinjrapoles.

Central Goshala Development Board was formulated in 1949 with the sole objective of developing existing Goshalas and Pinjarapoles having strength of about 6 lakh heads. In the second five year plan period, development activities were intensified. For the production of quality bulls, 246 Goshalas were selected. In the third plan, again 168 more Goshalas were provided with financial and technical aid and were converted into cattle breeding cum milk production units. It could well be pointed out that on several occasions, many cows belonging to these Goshalas could win the milk yield competitions at the national level.

(c) Central Council of Gosamvardhana

Central Council of Gosamvardhana came into existence in 1952 with the main aim of effecting all round coordinated cattle development at the national level. Council was reconstituted by the Government of India in 1960 and its structure as well as functions were enlarged. The activities were modified to cover organization, implementation and coordination of all programmes and policies relating to “preservation and development of cattle for the increased production of milk and the draft power. Some of the achievements of the council are as below:

- ^{2/21} it provided a common forum for administrators, scientists, and non official workers with cattle development work.
- ^{2/21} established a close collaboration with central and state Governments and other voluntary organization for advancement of cow and her progeny.
- ^{2/21} council could arouse the public interest in the development of cattle by organizing “Gosamvardhana Week”.
- ^{2/21} conducted the various programmes of seminars, cattle shows and rallies.
- ^{2/21} issued journals, books, films and pamphlets for workers.
- ^{2/21} worked to provide a planned base for preservation and development of cattle.
- ^{2/21} paid considerable attention on the breeding of cattle and adopted a sound breeding policy for entire country at its Mount Abu Seminar in June, 1960.
- ^{2/21} conducted one year training course for its Goshala managers.
- ^{2/21} Lamer reported in 1960 that there are over 3000 charitable institutions, where 10% of the cattle are estimated to be in some kind of productive activities. These charitable institutions were run by public and religious organizations, but could also muster grant from central and state Governments. Some of the other organizations working in Gujarat, Maharashtra and Bengal area are Baba Mast Ram Trust, Deen Dukhiya Mal Trust, Gandhi Samarak Nidhi and Kasturba Gandhi Trust. All these organizations were catching stray animals from the urban areas and were maintaining them on their farms.

iii. ICAR its Institutes and Agriculture Universities

Indian Council of Agricultural Research fully financed by Govt. of India is playing a crucial role in the development of dairy industry in India. ICAR is the sole body, which formulates the basic policy of dairy development, provides coordination among the various programmes and guides their execution. Various institutes of ICAR such as National Dairy Research Institute (NDRI) at Karnal (Haryana) Indian Veterinary Research Institute (IVRI) at Izzatnagar (U.P.) Central Institute of Research on Buffalow (CIRG) at Hissar (Haryana), Central Institute of Research on Goats (CIRG) at Makdoom (U.P.) and National Bureau of Animal Genetic Resources (NBGR) at Karnal (Haryana) are engaged in research pertaining to dairy development. In addition to the above mentioned institutions various agriculture universities under ICAR are also engaged in the dairy development in the country.

Some of these institutes like NDRI and IVRI and many of the agriculture universities are also importing dairy education to create skilled manpower for dairy plants and research institutions in the country.

The policy regarding dairying is formulated and recommended by the Dairying Committee of the Animal Husbandry wing of the Board of Agriculture and Animal Husbandry. ICAR is also deeply concerned with the Dairy Education and Research in the country. It subsidizes Indian Dairy Diploma at Allahabad, publishes books on dairy science and organizes trainings programmes. It is engaged in sponsoring and giving grants to various agricultural Universities in the country for several research projects on the problems related to dairying.

iv. International and Foreign Agencies

The credit of success in the development of dairying in India partly goes to the international organization, which have provided the aid to finance the various activities from time to time. It has been estimated that out of the total amount spent in India from 1951 to 1969 on various development projects, the share of international agencies is of the order of about 20%. Out of the total aid, 58% has been received from USA alone, the share of the World Bank and IDA, Federal Republic of Germany, Britain and USSR was around 13%, 7%, 6% and 6% respectively. Canada and Japan has provided about 7% of the total aid. The remaining 3% has come from another group of 15 countries, the prominent among them being France, Czechoslovakia, Australia and Netherland. The aid received from various agencies is discussed below:

(a) United Nations International Children Emergency Fund (UNICEF)

UNICEF is a pioneer organization, which is spending on an average Rs. 15 crores per year and has contributed significantly towards the development of dairying in India. The procedure adopted to provide/sanction the aid is by approval of joint committee of UNICEF/FAO, who conducts on the spot survey and discusses it in detail with the Central/State Governments. It has helped in the construction/setting up of 17 dairies in the country. In the Rupee Reimbursable Programme, India could get Rs. 90.55 lakhs for Worli, Kaira, Rajkot, Ahmedabad, Kolkata, Aarey Milk Colony, Bangalore Dairy and National Dairy Research Institute, Karnal. In addition to this, Rs. 4.42 crore were provided for various other dairy projects. All this aid which was received from UNICEF was used for the purchase of milk powder, milk plants, equipment and machinery, planning and setting up milk plant and providing training. Apart from this, UNICEF contributed towards organizing dairy teachers tutorial workshop and T.A./D.A. for personnel attending the First Dairy Industry Conference held in India in 1964. The repayment of the aid received was in terms of supplying the milk to the children and nursing mothers in the country.

(b) Food and Agriculture Organisation (FAO)

FAO provided the experts in the implementation of dairy projects in the country. They also helped in conducting the surveys and met the expenditure of training of the Dairy Technicians deputed in the dairy developed countries. Help was also provided for conducting various programmes like Regional Dairy Course at Bombay, meeting on Dairy Problems in Asia and Far-East countries etc. A sum of Rs. 26.86 lakhs was provided for the supply of cattle feed to milk producers of Hyderabad and Delhi. In the process, Punjab was given 250 Friesian heifers from U.K.

Under the Operation Flood Programmes which will be discussed in the later part of this section, 12600 tonnes of skimmed milk powder and 42,000 tonnes of butter oil was sanctioned in 1969, which was to be received in 5 years period, but due to certain reasons, this could not be completed even in 10 years.

(c) CARE

UNICEF and CARE along with other organizations from the United States and India donated 28,000 tonnes of skim milk powder each year valued at Rs. 3 crores for free distribution among School children.

(d) Oxford Committee for Famine Relief (OXFAM)

OXFAM has donated Rs. 14 lakh for the purchase of feed mixing plant to be installed at Kaira District Milk Cooperatives Union.

(e) Heifer Project

Heifer Project Inc. was conceived in 1938 by Dan West, engaged in a church as church relief worker in distribution of milk powder to orphans and babies who were the victims of Spanish civil war. In the later stage, it was considered better to donate cows rather than milk. Under the project by 1962, it had shipped more than 25,000 farm animals and 7.50 lakh chicks and hatching eggs to over 60 countries. India also got in 1955, 6 Jersey bulls for breeding purposes. Arrangements were also made to supply frozen semen from Canada for inseminating other animals. In 1962 again, 78 Jersey bulls and 66 heifers valued at Rs. 33 crores were shipped to India in three installments. In Oct. 1969, 90 Jersey and Friesian heifers and bulls were received from New York. In Nov. 1969, 62 Jersey heifers, 21 Jersey bulls, 10 Friesian heifers and 9 Friesian bulls of top quality were supplied to India. Under this project, USA also gave a free gift of 50 American Jersey cattle (41 bulls, and 9 heifers). USA also provided Brown Swiss Frozen Semen for a cross breeding project at NDRI, Karnal. It is through this only that NDRI could develop Karan Swiss breed, which is considered as a quality breed and yields heavily.

(f) For Those Who have Less Project

Under this project, consignments of animals were received from Australia of various breeds like Guernseys, Friesian and Jersey for breeding purposes. These were distributed in various states like Tamil Nadu, Assam, Maharashtra and Kerala.

(g) International Dairy Federation (I.D.F)/Dairy Society International

International Dairy Federation and Dairy Society International has also contributed to the development of dairying in India. These two organizations discuss problems of international interest. It has set up a separate Commission in 1954 to study the problems of dairying in warm countries.

(h) Aid from other Countries.

Though not very significant (3%) aid has been received by India from various countries like Japan, Italy, France, Czechoslovakia, Australia, Netherlands, Yugoslavia, Poland, Switzerland, Belgium, Austria, Sweden, Denmark, Norway, New Zealand, Hungary and Bulgaria.

Check Your Progress 1

1. Name some of the agencies engaged in the development of animal husbandry and dairying in India?

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2. What are the major activities of community Block Development programme?

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3. Name some of the Non Government Organizations and the autonomous bodies and councils engaged in the dairy development in India?

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4. Name any five international agencies helping dairying in India to develop?

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1.4 DAIRY DEVELOPMENT FROM 1970 ONWARDS

In this country, three forms of organization *viz.* private, government and cooperatives have helped in the development of dairying and animal husbandry. The private dairies by and large have been observed to be solely interested in earning maximum possible profits and have never cared for providing the necessary incentives for milk production. Obviously, there can be no hope for improving the dairy industry by depending on private enterprises owning and operating milk plants. The performance of city milk supply schemes, managed by the Government, did not also prove satisfactory and encouraging. The experience of most successful Dairy Cooperatives such as AMUL and the results of Operation Flood programme being implemented by the erstwhile Indian Dairy Corporation (financing agency for the programme)/ National Dairy Development Board through cooperative organizations has shown that organizing dairying on cooperative lines would only yield desired results. How milk cooperatives have emerged as the most cohesive organizations of the farmers which could handle the milk procurement, transport, processing and marketing of milk on the one hand and how they can improve and enhance the milk production through an infrastructure designed for the purpose and also raise the income and social standards of the rural community in the country on the other hand are some of the important points, which need special emphasis.

i. Dairying through Co-operatives - Anand Pattern

It may be interesting to recall as to how Anand Pattern of organizations came into existence, took shape and ultimately became the model for developing dairying in the entire country. Like other places in the country, in the Kaira District in Gujarat also, milk was being purchased by private vendors. The milk vendors exploited the milk producers by low and defaulting milk price payment, incorrect weightment, and provided little incentive to improve the milk production. Ultimately, the farmers of the district had to decide, striking against these exploitative activities of the private vendors and founded the village cooperatives to procure bulk of their milk and market it. It was with the guidance from able leaders like Late Sardar Vallabh Bhai Patel and Shri Morarji Desai that this beginning could be made. Few of the village cooperatives so organized joined together and formed into a union called the Kaira District Milk Producers Co-operative union at Anand, now popularly known as AMUL.

The success of the concept of managing the milk business by milk producers themselves” at the Kaira District Milk Producers Cooperative Union also AMUL led to the emergence of the strong development tool known as Anand pattern”.

The basic unit in the Anand Pattern in the village Milk Producers’ Co-operative Society – a voluntary association of milk producers in a village, who wish to market

their milk collectively could become a member of the Co-operative Society. At a general meeting of members, representatives are elected to form a managing committee, which manages the day-to-day affairs of milk collection and its testing for fat content, sale of cattle feed, etc. Each society also provides Artificial Insemination (AI) Services and Veterinary First-Aid.

Each milk producer's milk is tested and paid for on the basis of the quality of milk. Usually the morning milk is paid for in the evening and the evening milk is paid for the next morning. The village societies also market nutritionally balanced compounded cattle feed produced by a cattle feed plant owned and operated by the district level union. The balanced cattle feed is sold on a no-profit-no-loss basis.

The primary milk producers' societies are affiliated to a district union, which owns and operates a feeder/balancing dairy, cattle feed plant and facilities for production of semen and its distribution. The Union also operates a network of veterinarians to provide routine and emergency services for animal health care. The village societies elect the Board of Directors of the Union, which is responsible for the day-to-day management of the union's centralized facilities for milk collection station, processing and marketing of inputs. Each union is professionally managed by a Managing Director, who reports to the elected Chairman and the Board of Directors. The dairy, owned by the Union, usually has a milk drying plant to convert the seasonal surpluses into milk powder and other conserved products. In turn, all the milk union form a federation.

ii. National Dairy Development Board

In the year 1964, the then Prime Minister of India, Late Shri Lal Bhadur Shastri desired that a 'body' should be set up, with the Government's assistance, which would help replicate the Anand pattern of Dairy Cooperatives in other parts of the country. And thus, the Ministry of Agriculture and Irrigation, Government of India, constituted the National Dairy Development Board (NDDB) in September, 1965 under the Societies Registration Act. The major objectives of the NDDB are:

- ^{2/21} to promote projects of general public utility relating to dairying, animal husbandry, food and agriculture, fisheries and cold storages.
- ^{2/21} to make available, on request, the information, skills and technical services needed to increase production of milk and dairy technical inputs and to speed up procurement, processing and distribution of milk.
- ^{2/21} to prepare initial feasibility studies and to design, plan and start-up of operations.
- ^{2/21} to provide manpower development services for dairy and allied projects by organizing technical programmes for training personnel.
- ^{2/21} to help in the selection of equipment and undertake bulk procurement services.
- ^{2/21} to offer consultation services on dairy and allied operations in the field of planning, control, including quality control, organization and marketing back up, wherever necessary, by research within the NDDB and outside, in other organization.
- ^{2/21} to serve as international liaison to other National Dairy Boards and international agencies and to facilitate the exchange of information and personnel: as also to assist other countries' dairy development, and
- ^{2/21} to conduct research in the field of dairying and animal husbandry.

iii. The Three Phases of Operation Flood (OF)

The first phase of Operation Flood (OF-I) was originally designed to be implemented over a period of five years but was extended till March 31, 1979. The main objective of OF-I was to create a virtual flood of rurally produced milk and lay a foundation for modernizing India's dairy industry. The second phase of Operation

Flood (OF-II) was launched on October 2, 1979, while OF-I was still underway and concluded on March 31, 1985. OF-II was designed to build on the foundation laid by OF-I to create a modern and viable dairy industry to meet the nation's requirements for milk and milk products. The third phase of Operational Flood (OF-III) was started on April 1, 1985 to consolidate the extensive milk procurement, processing and marketing infra-structure created under OF-I and OF-II and finally completed on March 31, 1996.

OF-I was financed by the funds generated from the sale of 126000 MT of Skimmed Milk Powder and 42000 MT of Butter Oil donated to India by the World Food Programme (WFP), an agency of Food and Agricultural Organisation (FAO) of the United Nations Organisation (UNO). In 1970, the original allocation for OF-I was Rs. 95.40 crore for a period of five years, 1970-71 to 1974-75. This was subsequently revised to Rs. 116.54 crore. The funds generated from the sale of donated dairy commodities since the inception of the programme till March 31, 1981 amounted to Rs. 114.68 crore and the actual disbursements over the same period of time were Rs. 116.55 crore. The denoted commodities were received, and sold, on behalf of the Government of India, by the IDC, which as mentioned earlier was the financing agency for the programme. The funds were disbursed by the IDC as 30% grant and 70% loan to the implementing agencies nominated by the participating State governments.

Goal of Operation Flood: This was originally conceived as a milk marketing project aimed at enabling the modern dairies to capture commanding shares of the liquid milk markets in India's four metropolitan cities of Bombay, Calcutta, Delhi and Madras. This goal was to be achieved by creating a virtual 'flood' of milk in the rural milk sheds of these four metropolitan cities and channeling the flood to the liquid milk markets of these cities through a producer-owned-and-controlled co-operative system of milk procurement, processing and its marketing. Eventually, the goal of OF was broadened to include improvements in the standards of dairy farming by introduction of improved methods of breeding, feeding, health care and management of dairy animals backed up by necessary training and extension services. Implementation of operation flood programme through an integrated approach has been taken up under various action items as follows:

- ^{2/21} expansion of city dairies.
- ^{2/21} new dairies in four cities.
- ^{2/21} storage and long distance transportation
- ^{2/21} rural dairy processing.
- ^{2/21} resettlement of city kept cattle.
- ^{2/21} milk production enhancement inputs.
- ^{2/21} improved milch animals.
- ^{2/21} organisation of rural procurement
- ^{2/21} project planning and manpower development
- ^{2/21} unloading, storing, transport and central pool.

Although, there were several difficulties with regard to the quality and continuity of dairy commodities received for the programme, the funds generated from their sale provided enough liquidity, buffer, and freedom to the IDC to finance the programme. The programme caused no financial strain on the Government of India's resources. Besides, the programme administrators learnt quite a few useful lessons from their experience with this form of aid and on that basis modified the procedure of receipt of donated commodities. For OF-II, donated commodities were received directly from the donors but not through any intermediaries as was the case with OF-I, and there were face-to-face and man-to-man dealings between the recipients and the donors. OF-II had an original outlay of Rs. 485.51 crore. The

European Economic Community (EEC) assisted it with a donation of 1,86,000 MT of skim milk powder (SMP) and 76,000 MT of butter oil (BO). About US \$ 150 million was provided by the World Bank in the form of loans on soft terms. OF-II was approved by the Government of India for implementation during Sixth Plan period with an outlay of Rs. 273 crore. OF-III had an investment of Rs. 1303.1 crore of which Rs. 1095.4 crore was received as the external assistance from the World Bank and EEC and Rs. 207.7 crore by the NDDB's own resources.

OF-III continued to be the major dairy development programme in the Seventh and Eighth Plan period. The main thrust of this programme was the dispersal of dairy development activities on a wider scale in the country and strengthening further the National Milk Grid (NMG) for balancing seasonal fluctuations in milk procurement and marketing, some 1,108 road/rail milk tankers had been provided to meet the requirements of the four metropolitans and other big cities especially during the lean season. Adequate storage facilities were also set up (33,750 MT for milk powder and 4,280 MT for butter oil) to facilitate the operation of NMG. This grid is also helping to even out inter-regional gaps between the demand and supply of milk. With the increase in the production of milk and milk products, the Government of India recognized the NDDB as an agency to stabilize the domestic prices of milk and milk products and exploit any export potential for Indian dairy products.

At the request of the Government of India, the International Development Association (IDA) which is an affiliate of the World Bank, financed three dairy development projects in the States of Karnataka, Rajasthan and Madhya Pradesh. Like OF-I, these projects also sought to replicate the AMUL model of dairy development.

Major Achievements of Operation Flood: OF projects were well underway in 170 milksheds covering 267 districts in 23 States/Union Territories in the country by the end of 1995-96. Except Arunachal Pradesh, Meghalaya, Manipur, and Mizoram, all the states originally envisaged for coverage under the OF programme had been covered. Over 92.63 lakh milk producing families were participating in the programme and over 72.5 thousand VMPCS had been established in the country.

By March 31, 1996 (end of OF-III), the average milk procurement under OF had increased nearly two times as compared to the level of production at the end of OF-II. Almost the same rate of increase was observed during the OF-II period. The average growth in milk procurement in the OF and IDA-assisted project areas was over 20% per annum during the sixteen-year period from the base year of 1980-81. By the end of 1995-96, the total milk processing capacity in the OF milk sheds had gone up to 21.97 million litre per day with an annual growth rate of over 14% per annum since the end of OF-I (1980-81). In many milk sheds in states like Rajasthan, Maharashtra, Tamil Nadu, the capacity created has fallen short of the requirement especially in the peak flush month when milk procurement had to be discontinued to contain the flow of milk to the plants. Altogether by the end of OF-III, the dairies under OF recorded an average milk processing capacity utilization nearly 67% during the peak milk procurement month (January, 1996) and 55% on an annual basis.

Presently, OF dairies are having their milk distribution network in over 778 cities (including 175 metro and class I cities) out of the total of 3700 cities and towns in the country. The average daily liquid milk supply from all sources in the metro cities by the end of March 1995 was 9.42 million litres of which dairy co-operative sector organized through OF contributed 3.47 million litres. During the year 1994-95, OF projects produced nearly 2,68,000 MT of milk powder (including SMP, WMP, baby food), 40,000 MT of butter and 1,30,000 MT of ghee. Milk powder manufacturing capacity in the country increased from 58.50 MT per day in 1970 to 842 MT per

day in 1995-96 and use of imported SMP came down from 19.0 thousand MT in 1970 to 0.7 thousand MT in 1993.

iv. Technology Mission on Dairy Development

The Government of India launched a Technology Mission on Dairy Development (TMDD) in August 1988 to support and supplement the efforts of the OF programme thereby enhancing rural employment opportunities and income generation through dairying in 264 OF districts in the country. The objectives of TMDD were to accelerate the pace of increasing rural employment and income through dairy development on co-operative lines; to accelerate the pace of application and adoption of modern technology to improve overall dairy productivity; to ensure greater availability of milk and dairy products; to dovetail state government programmes in animal husbandry, dairying, poverty alleviation, IRDP etc. with that of the dairy co-operatives; and to dovetail research programmes of the central government research institutes, agricultural universities and NDDDB for optimum results. TMDD concluded in March 1997. While the targets for the TMDD during the Eighth Five Year Plan have been achieved to a large extent, the dairy industry needs to improve its performance in many crucial areas. Increasing the productivity of Indian cows and buffaloes, control and containment of animal diseases, improving the regularity and reliability of livestock related data, enforcing high quality standards for dairy products etc. are important areas for urgent interventions.

v. BAIF Development Research Foundation

It was March, 1946 - the dawn of Indian Independence. The brief sojourn of the Father of the Nation - Mahatma Gandhi to Urulikanchan, a backward village near Pune, marked the turning point in community development. Promotion of community health through nature cure became a reality with the establishment of a Nature Cure Centre, managed by his trusted disciple Manibhai Desai.

The village presented an appalling picture to Manibhai. Unemployment and underemployment being the root causes of poverty, Manibhai decided to promote income generation activities as the main plank of development. Cultivation of high yielding varieties of food crops, vegetables and fruits was his first successful venture. However, he realized that these technologies would only benefit the well to do farmers and widen the gap between the rich and the poor.

He maintained a dairy herd consisting of an elite cattle breed - Gir. Although the herd produced several champion cows, the dairy incurred losses due to genetic limitations of this breed. This made him launch a unique experiment of breeding the Gir as well as the local non-descript cows with exotic milch breeds. The new-born crossbred cows were able to produce 10 times more milk than their mothers. Most of the poor farmers who owned non-descript cows were willing to take part in cattle development.

The encouraging response from the rural community prompted Manibhai to establish the Bharatiya Agro Industries Foundation (BAIF) at Urulikanchan in 1967, to replicate his novel experiments in rural development. Later it was renamed as BAIF Development Research Foundation.

Check Your Progress 2

1. When was the NDDDB constituted? Give in brief its major objective?

.....
.....
.....
.....

2. Name the three phases of Operation Flood and the date of start?

.....

3. Discuss the various action items in the implementation of Operation Flood?

.....

4. On which date the TMDD was started and concluded?

.....

1.5 PRESENT POSITION OF DAIRYING IN INDIA

With all the development activities going on in the country, India has ushered into white revolution, and has come at number one position in terms of milk production in the world.

i. Production and Import of Milk Powder

We have stopped the import of milk and milk products altogether rather we have started exporting it. The figures of the import of milk and milk products revealed that in 1960-61, India has imported 18.79 thousand MT of whole milk and commercial milk powder which increased to 53.86 thousand MT in 1961-62. It varied from 34 thousand MT to 53 thousand MT and was found to be 31 thousand MT in 1969-70. From that time onwards, import was almost negligible except for the free gift of skim milk powder and butter oil, which India could get under the Operation Flood Programme. It is worth noting that our own production started in 1967-68 (13.23 thousand MT) and went on increasing. In 1979-80, we produced 64,000 MT of milk powder.

ii. Milk Production

The total milk production in India in 1950-51 was 17.0 million tonnes, which increased to 20.0 million tonnes in 1960-61, 22.0 million tonnes in 1970-71. This was 31.6 million tonnes in 1980-81. In other words the milk production increased at a growth rate of about 3.6% per year. After 1969-70, the milk production started increasing at a faster rate and more particularly after 1992-93, when the growth rate was ascertained to be 4.5% per annum. This growth rate was found to be more or less of the same order till recently. (Table 1.1)

iii. Per Capita Availability of Milk

The per capita availability of milk was only 124 g in 1950-51. But with the increase in population which was much faster than the milk population it came down to 112 g in 1970-71 and continued to slighed upto 1980-81. Thanks to the development programme initiated by the Government in the various state that the operation flood programme which showed the results and the per capita availability increased to 176 g (1990-91). Within five years period, the per capita availability increased to 223 g (2000-01). The milk production as well as the per capita availability continued to increase and in 2001-02, it touched a figure of 226 g. Assuming that it is

increasing at the same rate, the predicted figure for the year 2004-05 could be somewhere around 232 g (Table 1.1). But still we have to go a long way. The per capita availability consumption recommended by the Human Nutrition Advisory Committee of the Government of India is 250 g.

iv. Growth Pattern of Livestock Population

The increase in the production of milk and subsequently the per capita availability has been achieved through the various efforts and development programmes. Though the bovine population has also increased, but the increase in the milk production and the per capita availability is much faster. It could be observed from Table 1.2 that the growth rate in cattle was negative in 2003 over 1997. In case of buffaloes, however, it was 8.90 per cent with annual growth rate of 1.78 per cent in 2003 over 1997.

Table 1.1: Production and Per Capita Availability of Milk

Year	Milk(million tonnes)	Per Capita Availability (g/day)
1950-51	17.0	124
1960-61	20.0	124
1970-71	22.0	112
1980-81	31.6	128
1990-91	53.9	176
2000-01	81.43	223
2001-02	84.57	226
2002-03	86.7	230
2003-04	88.1	231
2004-05	91.0	232

This all goes to show that the increase in milk production is not due to increase in bovine population, rather the productivity of animals has increased, but still the productivity of the animal is much lower than the western countries.

Table 1.2: Growth pattern of Livestock Population

Sl. No.	Species	Livestock Population (in million)		Growth rate during 5 years period (%)	Annual Growth rate (%)
		1997	2003	2003 over 1997	
1.	Cattle	198.88	185.18	-6.89	-1.38
2.	Buffalo	89.91	97.92	8.90	1.78
3.	Sheep	57.49	61.47	6.91	1.38
4.	Goat	122.72	124.36	1.33	0.27
5.	Pig	13.29	13.52	1.72	0.34
6.	Others	3.09	2.55	-17.47	-3.49
	Total Livestock	485.38	485.00	-0.08	-0.02

Check Your Progress 3

1. What is the total production and per-capita of availability of milk for the year ending 2004-2005?

.....

2. State about growth rate of cattle and buffalo population.

.....

1.6 LET US SUM UP

The origin of livestock wealth is as old as evolution of human society. The share of India in the world's population is 25%, whereas the milk production is a little over 14.20%. The country has about 16% of cattle, 57% of buffalo, 17% of goat, and 5% of sheep population of the world and ranks first in respect of cattle and buffalo, second in goats, and third in sheep population. In India, the contribution of livestock sector to the total national income is around 6.5%. To have clear cut idea, the development activities can be studied in three phases viz., Pre-plan, Post-Plan upto 1969-70 and after 1970. Not much work has been done in the pre-plan period except for appointment of certain commission who recommended the setting up of some military farms for the supply of quality and pure milk for the British troops/ Personnel inducted in the army. Some dairies in the Co-operative and Private Sector were also established.

In the post independence period viz. 1947 to 1970, various development programmes in the Public Sector viz. Community Development Programme, Key Village Scheme and ICDP were started. Many NGO's like Gosadan Scheme, Goshala and Pinjrapoles, Central Council of Gosavardhna contributed towards the development of dairying & animal husbandry. Many other organizations like ICAR, NDRI and IVRI also contributed significantly. The role played by various international organizations like UNICEF, FAO, CARE, OXFAM, HEIFER PROJECT, FOR THOSE WHO HAVE LESS, IDF/DSI is worth mentioning. Many other countries in their own capacities and have shown their concern and have contributed towards the development of dairying in India.

In the 3rd phase (from 1970) dairy development picked up at a much faster speed. The role played by the co-operatives and more particularly Anand Pattern Co-operatives is worth mentioning. The National Dairy Development Board formulated in 1965 took up the 'OF' programme in three phases viz., OF-I, OF-II and OF-III. During this period, the number of Anand Pattern Cooperatives increased, increasing the total milk production.

Present position of dairying reveals that we are ushering into white revolution. We have stopped the import of milk products rather started exporting it. The milk production has increased form 17.0 million tonnes (MT) in 1950-51 to about 91 mt. at present. The per capita availability has also increased from 112 gms in 1968-69 to 232 gms. The strength of animals/bovines have also increased but the quality of the animals & their productivity has increased significantly.

1.7 KEY WORDS

GDP	:	Gross Domestic Project
FAO	:	Food and Agriculture Organisation
Institutional credit	:	Credit form Organised agencies.
Subsidy	:	A grant of public money in aid of some enterprise or industry.
Artificial Insemination	:	To implant or impregnate artificially
Castrated	:	To remove testicles/To make unfit for breeding
Processing	:	To prepare for market by special process or conversion into Products
Adulteration	:	Mixing with something inferior or spurious
Mandate	:	To act according to declared polices.
Dissemination	:	To propagate
Aid	:	Monetary help donated to relieve poor.
UNICEF	:	United Nations International Children Emergency Fund
OF	:	Operative Flood
Heifer	:	A young cow (2-3 yrs. age which has not yet calved)
Per Capita Availability	:	Availability for a person per day
Cooperatives	:	Association of persons for the purpose of joint trading etc.
Cattle Feed	:	Concentrated Feed for Cattle
NDDB	:	National Dairy Development Board.
Feasibility	:	Viability
Bulk Procurement	:	Procurement of Material in lump-sum
Trends	:	To have a tendency
Man Power	:	Available resources in population
BO	:	Butter Oil
SMP	:	Skim Milk Powder
EEC	:	European Economic Community
VMCCS	:	Village Level Milk Consumers Cooperative Society

1.8 SOME USEFUL BOOKS

- ^{2/21} Khurody, D.N. (1974). Dairying in India, Asia Publishing House, New Delhi.
- ^{2/21} John, P. (1975). Economics of Dairy Development, Parbhat Parkashan, Patna (Bihar)
- ^{2/21} NDDB, ANAND, Extension Material/pamphlets (Published from time to time).
- ^{2/21} Govt. of India, Ministry of Agriculture, Department of Animal Husbandry & Dairying (1998, 1999, 2000, 2001) Basic Animal Husbandry Statistics.
- ^{2/21} Govt. of India, Five Year Plans.
- ^{2/21} 17th Livestock Census Report. (2003). Ministry of Agriculture, Department of Animal Husbandry & Dairying.

1.9 ANSWERS TO CHECK YOUR PROGRESS

Your answer should include the following points :

Check Your Progress 1

- 1) i. ^{2/21} Government/Public Sector
^{2/21} Research Institutes/Agriculture Universities
^{2/21} Non-Government organizations.
^{2/21} International aid and Foreign and agencies/countries
- 2) i. The major activities of the Community Block Development Programme are in the field of: (i) Agriculture (ii) Animal husbandry (iii) Irrigation (iv) Communication (v) Health (vi) Education (vii) Supplementary employment (viii) Housing (ix) Training and (x) Social welfare.
- 3) i. ^{2/21} Gosadan Scheme
^{2/21} Goshala and pinjrapoles
^{2/21} Central Council of Gosamwardhna
^{2/21} ICAR
^{2/21} NDRI
- 4) i. UNICEF, FAO, CARE, OXFAM and Heifer project

Check Your Progress 2

- 1) i. The NDDB was set up in Sept. 1985 under the Societies registration act. The major objectives of the NDDB are:
 - ^{2/21} To promote projects of general public utility relating to dairying, animal husbandry, food and agriculture, fisheries and cold storages.
 - ^{2/21} To make available, on request, the information, skills and technical services needed to increase production of milk dairy technical inputs and to speed up procurement processing and distribution of milk.
 - ^{2/21} To prepare initial feasibility studies and to design plan and start-up of operations.
 - ^{2/21} To provide manpower development services for dairy and allied projects by organizing technical programme for training personnel.
 - ^{2/21} To help in the selection of equipment and undertake bulk procurement services.
 - ^{2/21} To offer consultation services on Dairy and allied operations in the field of planning, control, including quality control, organizations and marketing back up, wherever necessary by research within the NDDB and outside, in other organizations.
 - ^{2/21} To serve as international liaison to other national Dairy boards and international agencies and to facilitate the exchange of information and personnel: as also to assist other counties dairy development and
 - ^{2/21} To conduct research in the field of dairying and animal husbandry.
- 2) i.

Operation Flood - I – July 1970 Operation Flood - II– October 1979 Operation Flood - III – April 1985	Additonal information is given at the end of the unit
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- 3) i. ^{2/21} Expansion of city dairies.
^{2/21} New dairies in four cities.
^{2/21} Storage and long distance transportation
^{2/21} Rural dairy processing.
^{2/21} Resettlement of city kept cattle.

- 2।21 Milk production enhancement inputs.
- 2।21 Improved milch animals.
- 2।21 Organization of rural procurement
- 2।21 Project planning and man power development
- 2।21 Unloading, storing transport and central poor.

4) i. TMDD was launched in August 1988 and concluded in March 1997.

Check Your Progress 3

- 1) i. Total Milk production – 91 million tones.
Per Capita availability – 232 g.
- 2) i. The increase in the production of milk and subsequently the per capita availability has been achieved through the various efforts and development programmes. Though the bovine population has also increased, but the increase in the milk production and the per capita availability is much faster. It could be observed from Table 1.2 that the growth rate in cattle was negative in 2003 over 1997. In case of buffaloes, however, it was 8.90 per cent with annual growth rate of 1.78 per cent in 2003 over 1997. This all goes to show that the increase in milk production is not due to increase in bovine population, rather the productivity of animals has increased, but still the productivity of the animal is much lower than the western countries.

Achievements of Operation Flood, 1970-2002

OF phases

Indicator	Phase I	Phase II	Phase III	Post-OF phase
Date Started	July 1970	October 1979	April 1985	April 1996
Date concluded	March 1981	March 1985	March 1996	March 2002
Investments(Rs. Million)	1,165	2,772	13,031	
No. of federations/apex milk unions operating	10	18	22	22
No. of milk sheds covered	39	136	170	170
No. of dairy cooperative societies set up (thousands)	13.3	34.5	72.5	74.3
No. of members (millions)	1.75	3.63	9.26	11.06
Average milk procurement (million kg/day)	2.56	5.78	10.99	17.60
Liquid milk marketing (million litres/day)	2.79	5.01	10.02	12.67
Processing capacity				
Rural dairies (million litres/day)	3.59	8.78	18.09	26.47
Metro dairies (million litres/day)	2.9	3.5	3.88	NA
Milk drying capacity (mt/day)	261.0	507.5	842.0	990.0
Technical inputs				
No. of Artificial Insemination centres (thousands)	4.9	7.5	16.8	22.0
No. of AIs done (million/year)	0.82	1.33	3.94	6.00
Cattle feed capacity (thousand mt/day)	1.7	3.3	4.9	5.2