Chapter 1

Dairy Development in India

Objective: *To acquaint with the dairy development scenario in India and the role of different agencies in dairy development of the country.*

Introduction

India's growth in the field of dairying has not been achieved within a single day. It has been a gradual process and the process has been achieved by successful implementation of several government initiatives. Operation Flood programme made enormous effect in the field of dairy development in India. Different government agencies like NDDB, NDRI, IVRI, NABARD, AMUL have contributed significantly to the growth story of dairy development in the country.

Dairying Preset Status

India has became the world's largest milk-producing nation with a gross output of 121.8 million tons in the year 2010-11 and this feat has been achieved due to the tremendous milk production increase during the last 40 years. The production as well as the Per Capita Availability (gms/day) was increased over the year, which has been shown in Table 1.

Table 1. Milk production and per capita availability

Year	Production (Million Tons)	Per Capita Availability (gms/day)
2001-02	84.4	225
2002-03	86.2	230
2003-04	88.1	231
2004-05	92.5	233
2005-06	97.1	241
2006-07	102.6	251
2007-08	107.9	260
2008-09	112.2	266
2009-10	116.4	273
2010-11	121.8	281

(www.nddb.org)

This tremendous development has not been achieved in a single day. The earliest efforts for dairy development can be traced back to British Period, when the Defence Department established military dairy farms to ensure the supply of milk and butter to the colonial army. The first of these kind of farms was set up in Allahabad in 1913; similar type of farms were established at Bangalore, Ootacamund and Karnal in subsequent years. These farms were systematically maintained and improved milch animals were raised for high milk production. In these farms, breed improvement initiatives were undertaken by using artificial insemination. This effort ensured the milk availability to the military personnel but it did not have any significant effect on the supply of milk to urban consumers, which was of major concern to civilian authorities. After the independence, India has seen huge population increase in the urban areas and the urban consumers had to depend on milk vendors who used to supply milk in the consumer's door step. These milk vendors were having their small cattle sheds in the cities, which resulted existence of several cattle sheds in different cities. The main objective of these milk vendors was to increase their profit margins and they neglected the hygiene as well as the proper breeding plans, which resulted in sterility problems in high-yielding animals and also the animals became unproductive. Genetically superior breeds of the country have been drained out due to these practices. In 1951, with the initiation of India's first

Five-Year Plan, modernization of the dairy industry got much more importance by the Government of India. The main objective was to provide clean and hygienic milk to the urban consumers and on this line Government established 'Milk schemes' in the large cities of the country. To increase the milk production and productivity, the Government of India implemented several programmes which included the Key Village Scheme (KVS) and Intensive Cattle Development Project (ICDP) etc. But the major problem faced by the dairy farmers were getting remunerative price for their produce and to have a well established marketing system. But due to the absence of organized milk market system, milk producers have to depend on the milk vendors and for these reasons milk production remained more or less stagnant over several decades. This situation can be supported by the fact that between 1951 to 1970, the growth rate in milk production was barely one percent per annum, on the other hand per capita milk consumption declined. But this scenario has been changed with the initiation of Operation Flood programme and several State Governments initiatives.

Future Prospects

By the continuous efforts of several stake holders India has built a modern dairy sector, which cater to the needs of milk producers as well as the consumers. This phenomenal growth and modernization in the dairy sector is attributed by the contribution of dairy co-operatives established under the Operation Flood (OF) Project, which was assisted by many agencies such as the European Union, Food and Agriculture Organization (FAO), the World Bank etc. With the efforts by central and state governments suitable breeding programmes was undertaken which resulted in the improvement of productivity and conservation of superior germplasm. Milk production has been increased manifold due to breed improvement programmes as well as the effective intervention by the extension mechanism in the field of dairy farming. Milk marketing became more systematic and producers' share in consumer rupees has been increased. This way producer got remunerative price for their produce as well as the consumer got milk and milk product in reasonable price. This resulted stability in the dairy sector which ensured future prospect for this sector. The overall development of Indian Dairy Industry during the last three decades has been impressive, at more than 5 percent per annum; and in the 90's the country has emerged as the largest producer of milk. In the future, dairy sector requires trained man power to handle big dairy farms and industries to cater to the need of millions of consumers. Dairy farmers have earned the favorable price for their produced milk and milk production has now being transformed into a true commercial proposition.

Role of Dairying in Indian Economy

Milk contributes a significant amount to the Agricultural Gross Domestic Product and its output value exceeded Rs. 1,00,000 crores and number of milk producers and quantity of milk produced both have been increased significantly in last two decades. With a share of about 14 per cent in world milk production, India stands first in world milk production. The contribution of livestock and fisheries sectors to the total GDP during 2009-10 was 29.7 percent. The estimate of the milk production in 2010-11 was 121.8 million tonnes as compared to 116.42 million tones in 2009-10 indicating growth of 4.66 percent (DAHD, Annual Report, 2011-12). Dairy farming is visualized by the farmers in the country as part of an integrated agricultural system where dairy and agriculture complementary to one another. Milk contributes more to the national economy than any other farm commodity (*Dairy India* 1997). In the context of poverty and malnutrition, milk has a special role to play for its many nutritional advantages as well as providing supplementary income to some 70 million farmers in over 500,000 remote villages (*Dairy India* 1997). In India dairy business has been practiced as rural cottage industry for several years. A large number of modern milk and milk product factories have since been established after independence. The organized dairy plants in India have been successfully engaged in the commercial production of liquid pasteurized packaged milk and several Indian dairy products. The Indian Dairy industry provides huge employment opportunity to a vast majority of the rural households.

Livelihood Security

Dairying plays a significant role in livelihood security for the rural farmers. Milk production system in India is dominated by small and marginal land-holding farmers and also by landless labourers who in aggregate own around 70 percent of the national milch animal herd. Crop farming in around 78 percent of arable land still depends on rain, which is prone to both drought and floods, rendering agricultural income is very much uncertain and risky for most of the crop farmers. On the other hand, Dairying, as a subsidiary source of income and occupation, is real relief to most of the farmers and a source of income during the period of extreme weather condition. Usually one or two milch animals enable the farmers to generate sufficient income to break the vicious cycle and enable them to ensure livelihood security.

Important Government initiatives

Key Village Scheme

The cattle development activities in the beginning era constituted with the distribution of breeding bulls to interested cattle breeders to upgrade the quality and productivity of cattle. The primary objective of the Key Village Scheme was to bring forth good pedigree type of cattle wealth and that too within a short span of time. The scheme launched in the year 1951. Therefore it was a scheme for the development of cattle in selected compact areas and provides a multifaced approach to the problem by simultaneous attention to breeding, feeding, disease control etc. The basic objective of the scheme was the rapid multiplication of crossbred cattle for meeting the acute shortage of high quality animals by grading up of the indigenous cattle population. The term Key village is expressively means that the village holds the key to the successful cattle improvement & can be achieved only by large scale work in villages where most of the cattle breeding is carried out. The key village was an intensive cattle improvement unit working in a compact area of the village or a group of contiguous villages having a total population of about 1000 breedable cows or buffaloes. The Scheme covered a very limited area.

Intensive Cattle Development Project (ICDP)

While Key village scheme was in implementation stage it was felt that there was a heavy demand of milk and scientist panel recommended that there was a need for concerted efforts to rapid increase in the milk production. Under this circumstances Intensive Cattle Development Project was launched in the year 1964-65. Under ICDP, the aim was to cover one lakh breedable animal so that the rapid increase in the milk production can be realized. The project was launched with the following objectives:

1. To provide controlled breeding facilities through artificial insemination (A.I.) for all the breedable female bovine population in the milk shed area of dairy plants with a view to increase milk production.

2. To provide balanced diet through comprehensive package programme of fodder production, setting up of feed mixing plants for distribution of feeds to dairy farmers through the dairy plants.

3. To protect the animals belonging to milk shed areas, against several diseases like Rinder pest, Hemorrhagic septicemia etc, to ensure safe dairy enterprise of the farmers.

4. To provide effective marketing facilities for the milk produced by farmers through establishment of cooperative societies.

5. To provide credit facilities for the purchase of milch animals.

6. To provide dairy extension services to make farmers more interested in scientific practices of livestock farming and to increase production.

The programme was launched in the milk shed area of major dairy plants which ensured the increased flow of milk to these plants. There is no doubt that ICDP did help in increasing milk production in the country to a great extent.

Operation Flood

Operation Flood was launched in 1970 which was one of the world's largest rural development programme. This programme has helped dairy farmers to direct their own development, placed control of the resources they have created and subsequently helped in achieving rural properity through dairying. A National Milk Grid linked milk producers throughout India with consumers in more than 700 towns and cities, reducing seasonal and regional price fluctuations while ensuring that the producer gets reasonable market prices in a transparent manner on a regular basis.

Objectives of Operation Flood

- Increase milk production
- Augmenting rural incomes
- Reasonable prices for consumers and producers

Implementation of Operation Flood Programme

Operation Flood was implemented in three phases.

Phase I (1970-1980): Phase I of Operation Flood was financed by the sale of skimmed milk powder and butter oil gifted by the European Union (then EEC) through the

World Food Programme. National Dairy Development Board planned the programme and negotiated the details of EEC assistance. During the first phase of implementation, Operation Flood linked 18 of India's premier milk-sheds with consumers in India's four major metropolitan cities, those were: Delhi, Mumbai, Kolkata and Chennai.

Phase II (1981-85): Phase II of Operation Flood increased the number of milk-sheds from 18 to 136 and 290 urban markets expanded the outlets for milk. When the Phase II ended, a self-sustaining system of 43,000 village cooperatives covering 4.25 million milk producers, had been achieved. Domestic milk powder production increased many times and this increase was due to the dairies set up under Operation Flood. Direct marketing of liquid milk, by the milk producers' cooperatives, increased by significant amount.

Phase III (1985-1996): This phase enabled dairy cooperatives to expand and strengthen the infrastructure required to procure and market increasing volumes of milk. Several initiatives, such as veterinary first-aid health care services, feed and artificial insemination services for cooperative members were extended, along with intensified education level of members. During the third phase 30,000 new dairy cooperatives have been added to the 42,000 existing societies organised during second phase. Milk-sheds peaked to 173 in 1988-89 with the significant increase in the numbers of women members as well as the Women's Dairy Cooperative Societies. This phase also emphasised the research and development on animal health and animal nutrition.

Impact of Operation Flood Programme

The progress of the Operation Flood Programme all over India has been quite commendable. Before the implementation of the programme both the production of milk as well as the per capita milk consumption was too low. The position at present, has undergone a distinctive change. Apart from the increase of milk production and its per capita consumption, a great number of Village Milk Co-operative Societies have come up. The trend of keeping milk animals in a scientific method has registered an increase too. As a result, import of milk powder from foreign countries substantially dropped and after 1976, its import on a commercial basis stopped totally. However the country got little amounts of milk powder after that, as gift. This testified to the fact that, with the inception of the Operation Flood Programme, the Dairy Development Movement in India and also the Dairy Industry has made remarkable progress.

New Policies/Schemes and Initiatives

National Dairy Plan I

National Dairy Plan Phase I (NDP I) is a Central Sector Scheme, which will be implemented during the period of 2011-12 to 2016-17. NDP I will be implemented with a total investment of about 2242 crore comprising 1584 crore as International Development Association (IDA) credit, 176 crore as Government of India share, 282 crore as share of End Implementing Agencies (EIAs) that will carry out the projects in participating states and 200 crore by National Dairy Development Board (NDDB) and its subsidiaries for providing technical and implementation support to the project. Board of Executive Directors of the International Development Association has approved a US$ 352 million credit on 15 March 2012 and Department of Animal Husbandry, Dairying and Fisheries, Government of India issued administrative approval of central sector scheme NDP I.

Objectives of NDP I

- To help in increase productivity of milch animals and thereby increase milk production to meet the rapidly growing demand for milk.
- To help in providing rural milk producers with greater access to the organised milk-processing sector.

Project area

The major focus of NDP I is on 14 major milk producing states namely Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal which together account for over 90 percent of the country's milk production. (www.nddb.org)

Important Dairy Development Organizations/Institutions and their Role in Dairy Development

National Dairy Development Board (NDDB)

The Government of India created the National Dairy Development Board in 1965 and made it responsible for appraising, promoting, and supporting dairy cooperatives. The head quarters of NDDB is situated in Anand, Gujarat. The NDDB was established for the following reasons:

NDDB
National Dairy Development Board

- To direct India's dairy development
- To plan and provide farmer extension services
- To improve dairy technologies, veterinary services, and nutrition.

Dr. Verghese Kurien was the founding chairman of the NDDB and was instrumental in transforming dairy cooperatives a reality and he has conceived the overall design for Operation Flood. The Indian Dairy Corporation, established to manage the financial aspects of the intervention, later merged into the NDDB, which continues to oversee dairy development programs throughout India today when the Operation Flood program is completed. (www.nddb.org)

Indian Veterinary Research Institute (IVRI)

The Indian Veterinary Research Institute is situated in Izatnagar. This Institute has been established in the year 1889. It is the premier and one of the oldest institutions in the field of veterinary and animal sciences. The institute, through its significant contributions, has created a niche in R&D on animal health and production, generation of technology, patents and their commercialization. The mandate of the Institute is as follows:

- To conduct research, provide postgraduate education and transfer of the technology in all areas of animal sciences with emphasis on animal health and production.
- To act as national referral centre for veterinary type cultures, disease diagnosis, biologicals, immunodiagnostics, etc.

The institute's valuable and significant contributions in the areas of livestock health protection, productivity enhancement, and products technology has played a pivotal role in ushering white revolution, which led the country to attain number one position in milk production in the world. The institute has made remarkable progress in the new IPR regime with patentable research and commercial technology transfers. The institute has also attained acknowledged excellence in post graduate veterinary education.(www.ivri.nic.in)

National Dairy Research Institute (NDRI)

National Dairy Research Institute is the premier institution of dairying in Asia. The Institute had its origin from Imperial Institute of Animal Husbandry and Dairying, which was established in Bangalore in 1923. In 1936, it was expanded and renamed as Imperial Dairy Institute. In 1955, its Headquarter was shifted to Karnal and the institute was renamed as National Dairy Research Institute. The Southern Regional Station at Bangalore and the Eastern Regional Station at Kalyani in West Bengal are providing the region specific R&D support for dairy development. For further strengthening of academic programmes of human resource development, status of Deemed University was conferred to the Institute in 1989. The Institute undertakes research, teaching and extension activities towards dairy development in the country. It also conducts basic and applied research with the objective to enhance animal productivity, develop new products and practices for the benefit of millions of farmers and consumers. The specific mandate of the institute is as follows:

- Conducting research in the areas of Dairy Production, Processing and Marketing.
- Demand driven 'Human Resource Development' to meet the requirements of Dairy Industry & R&D Institutions.
- Dissemination of innovative dairy production and processing technologies for socio-economic transformations

Over more than eight decades of its existence, the Institute has shown remarkable development and expertise in different areas of Dairy Production, Processing, Management and Human Resource Development.(www.ndri.res.in)

National Bank for Agriculture and Rural Development (NABARD)

NABARD was set up as an apex Development Bank with a mandate for facilitating credit flow for promotion and development of agriculture, small-scale industries, cottage and village industries etc. This institute also has the mandate to support all other allied economic activities in rural areas and to promote integrated and sustainable rural

development and secure prosperity of rural areas. In performing its role as a facilitator for rural development NABARD is entrusted with the following activities:

1. Providing refinance to lending institutions in rural areas

2. Bringing about or promoting institutional development

3. Evaluating, monitoring and inspecting the client banks

Apart from these activities NABARD also play significant role in the following aspects:

- Acts as a coordinator in the operations of rural credit institutions
- Extends assistance to the government, the Reserve Bank of India and other organizations in matters relating to rural development
- Offers training and research facilities for banks, cooperatives and organizations working in the field of rural development
- Helps the state governments in reaching their targets of providing assistance to eligible institutions in agriculture and rural development
- Acts as regulator for cooperative banks and RRB (www.nabard.org)

Amul

The Kaira District Co-operative Milk Producers Union Ltd. established with just two village dairy co-operative societies and handled 247 litres of milk and this Milk union today known as Amul Dairy. The founder chairman of this milk union was Tribhuvandas Patel, and the institution was got the current shape due to the efforts provided by Dr Verghese Kurien. The then Prime Minister of India, Lal Bahadur Shastri felt that the same approach should become the basis of a National Dairy Development policy. The basic unique attributes of this milk union is the farmers owned the dairy, their elected representatives managed the village societies and the district union. Not only that, the farmers employed professionals to operate the dairy and manage its business professionally.

International Dairy Federation (IDF)

The International Dairy Federation (IDF) is basically a science-based organization, which represents the dairy sector worldwide. It provides the best global source of scientific expertise and knowledge in support of the development and promotion of quality milk and dairy products to deliver nutrition, health and well-being to consumers. This federation aims to identify and disseminate best practice at the global level, in order to guide and harmonize members' work on issues related to climate change, nutrition and food hygiene at a national level. IDF is a non-profit private sector organization which represents the interests of various stakeholders in dairying at international level. This organization was established in 1903 and is represented in 53 countries worldwide. IDF members are organized in National Committees, which are national associations composed of representatives of all dairy-related national interest groups including dairy farmers, dairy processing industry, dairy suppliers, academics and governments/food control authorities etc.

Socioeconomic and Cultural Change

Socio-economic Change

Socio-economic studies in the social sciences analyze that how economic activity effectively alters the social processes. In simple words, it analyzes how societies progress, stagnate, or regress because of their local or regional economy, or the global economy as a whole. Schien described, social change is the induction of new patterns of action, belief and attitudes among substantial segments of a population. In majority of the cases, socio-economists focus on the social impact of some sort of economic change like establishment of the dairy cooperatives in the villages. This type of changes may be huge in size, just it was observed in case of Anand, Gujarat after the successful implementation of Operation Flood programme. Socioeconomic impacts include adoption of new technologies such as Artificial Insemination, changes in government laws, changes in the macro and micro environment in which the change process is going on. Thus in a single word it can be said that socioeconomic change refers to an alteration in the social order of a society due to some economic intervention.

Cultural Change

Cultural change is the process which is dynamic in nature whereby the living cultures of the world are changing and adapting to external or internal forces. Different cultures

around the globe are being changed due to environmental stresses, such as climate change, globalization and increased consumerism, economic policy of different nations etc. Intervention of technological innovations can enhance, displace or devalue human existence and culture throughout the world. Progress in the field of agricultural sciences has contributed to several changes, including migration patterns and nutritional security to the people. Indigenous Technical Knowledge developed by one culture is being used by another culture. Several cultures are being changed by the influence of another culture in open economic regime. Such as Indian culture has been influenced by the Western Culture and similarly Western culture has also been influenced by Indian Culture.

Livestock Farming System

The different types of livestock farming system can be classified in to the following categories:

1. Solely livestock farming systems

The basic concept of this type of livestock farming systems is that more than 90 percent of dry matter is fed to animals directly comes from rangelands, pastures, annual forages and purchased feeds and on the other hand less than 10 percent of the total value of production comes from non-livestock farming activities. In this type of farming system livestock is given the main emphasis. This type of farming system is of two types:

a. Landless livestock farming systems

In this type of livestock farming systems, less than 10 percent of the dry matter fed to animals is produced from farm.

b. Grassland-based systems

It is a type of solely livestock production systems in which more than 10 percent of the dry matter fed to animals is produced from farm.

2. Mixed-farming systems

The mixed farming systems of Livestock farming refers where more than 10 percent of the dry matter fed to the livestock comes from crop residues/by-products or stubble or more than 10 percent of the total value of production comes from non-livestock farming activities or other crop farming activities. The different type of mixed farming system are described as below:

a. Rain-fed mixed-farming systems

In this type of mixed systems more than 90 percent of the value of non-livestock farm production comes from rain-fed use of land or where the farming activities based on the water from rain.

b. Irrigated mixed-farming systems

In this type more than 10 percent of the value of non-livestock farm production comes from irrigated use of land.

3. Intensive Livestock Farming

When livestocks are kept in feedlots, stalls or cages for better management of the animals, it is known as intensive livestock farming system. The livestock live in farms and they eat feeding stuffs. It is characterized by high input of capital and investment.

4. Extensive livestock farming: The livestocks live in the open air and they eat natural pastures.

Activity

Visit to the important dairy development institutions.

REVIEW QUESTIONS

1. Describe the dairy development initiatives taken by Government to increase the country's milk production.
2. What do you know about the Operation Flood programme?
3. Describe the impact of Operation Flood Programme.
4. Name few dairy development organization/institution working in the field of dairy development in the country. Discuss their activities.
5. What do you know about National dairy Plan?