CHAPTER – III

REVIEW OF LITERATURE

An attempt is made in this chapter to provide a brief review of select studies pertaining to milk production in different states of India. The review includes the problems and prospects of dairy development in the country.

Rana¹ (1981) argues that the cattle wealth in India has been the backbone of our rural economy. However, cattle breeding did not receive the desired promotion it needed. With self-sufficiency in food grains, the country should now develop cattle breeding and milk production on modern lines which is both necessary for national health and acquiring self-sufficiency to meet the fat requirements of the growing population apart from gaining more ground in the sphere of exporting more and more leather and leather goods.

Prabhakara Sharma² (1984) examined the socio-economic conditions of the people engaged in dairy activities and also studied how far the dairy development schemes are able to create employment and earning prospects for small and marginal farmers and rural landless households.

Sambasiva Rao³ (1985), has indicated that quantities of dry fodder, green fodder and concentrates, number of lactations, labour hours and the age of the animals had together explained more than
three-fourths of the variations in the milk yield among marginal, small, medium, large and big farmers. It was also observed that the marginal value product of labour in all size groups except marginal farms was less than the factor cost. The marginal value product of dry fodder was greater than unity for the marginal and large farmers, less than one for the big farmers. In the case of green fodder and concentrates the marginal values were greater than unity for all size groups. Thus, there was a possibility of increasing milk yield by further use of green fodder and concentrates.

Martin Doornbos and K.N. Nair⁴ (1987) expressed the factors shaping livestock utilization patterns within Indian agriculture. Broadly, the seminar fell into the following five subject-categories: (a) basic production aspects, (b) organization of production, (c) dairy cooperatives and social change, (d) centralization and decentralization in dairy development and (e) the question of foreign aid. Baviskar and Shanti George⁵ (1988) had explained that the National Dairy Development Board (NDDB), which designs and implements Operation Flood, reacted to the controversy it aroused.

Philip Carl Salzman⁶ (1988) studied the cases of the South Surat Bharawad and the Umarpada Bharawad, illustrate two patterns of shift from nomadic to sedentary residence, from subsistence to market-oriented dairying. The two Bharawad groups illustrate the ways in which herding caste groups have revised their adaptive strategies, recognized their economies and are oriented their life
patterns. However, it cannot be assumed that the Bharawad cases are typical of other pastoral explained representative in their openness to social economic opportunities and their voluntary selection among available courses of change.

Kurien\(^7\) (1988) traces the progress of Operation Flood and indicates the lines of future dairy development. Pushkar Nath Bhat\(^8\) (1988) assesses the promise of embryo transfer technology for raising livestock quality. Parthasarathy\(^9\) (1990) tracing the advances in the White Revolution, points to the need for meshing this as a component of poverty alleviation programmes.

Krishnama Raju and Seshaih\(^10\) (1990) argued that to strengthen the rural economy, animal husbandry comes next to agriculture and dairying offers vast employment potentials as a supplementary means not only to farmers but also to the landless artisans engaged in different rural industries. To these dairy products also offer employment to many.

Krishnama Raju and Seshaih\(^11\) (1991) expressed that the cattle population has maintained a steady growth. It is found that agriculturally rich districts have lagged behind in the growth of cattle compared to agriculturally backward districts because in the latter case dairying has become a subsidiary occupation. However, farmers are to be educated to rear crossbred animals, which ensure maximum
milk production, and the Government should open pashushalas for dry and barren cattle.

Deepak Shah’s\textsuperscript{12} (1993) study analyses the spatial variations in Milk Production in India. This study provides an insight into the structural changes in milk production and brings forth various issues that require some bold initiatives on the part of policy makers. Data used for this study were collected from secondary sources. Time series data for fifteen years (1977/78 – 1991/92) on annual milk production of different states and Union Territories were collected from various issues of the annual publication ‘Bulletin on Food Statistics’ published by the Directorate of Economics and Statistics, Ministry of Agriculture, New Delhi.

The growth in milk production in more recent times is reported to have been much lower between 1990 and 1994 (only 4.26 per cent a year) compared to the period between 1980 and 1994. There is no iota of doubt that as a result of application of scientific production techniques, coupled with greater importance being given to the development of dairy – co-operative infrastructure, the total milk production of the country has increased to a considerable extent. India still has enormous potential in its dairy sector which if tapped in the desired manner and direction can lead us to emerge as a leading producer of milk in the world in the years to come. However, the slowing down in milk production increases in more recent times in most of the states and regions of the country have raised serious
doubts about our ability to meet the economic demand for milk as well as bridging the gap between supply of milk and nutritional requirement of the same. The fact that demand for milk in India is increasing fast as a result of several factors like population growth, increasing urbanization, increase in income level, increasing awareness about the nutritive value of milk, etc. The prospects for milk production in various states in the near future will also depend on the extent to which farmers take up fodder cultivation as an integral part of milk production. These measures to a large extent may provide rich dividends for increased milk production in the country.

Nayak, Satapathy and Panda\textsuperscript{13} (1994) found that most of the cattle population of the area consists of cow and goat. The possession of pure bred Jersey cow is very negligible, whereas farmers to an appreciable level possess crossbreds. Only 49.23 per cent of the farmers practiced A.I., where as many of them are accustomed to bull crossing. The reasons of non-practice of A.I. accounted for: accustomed with traditional method, calves are born weak, high mortality and non-availability of technical person in the locality. It is interesting that inspite of concerted efforts by the State Animal Husbandry Department, about 50 per cent of the sample did not know the benefit of A.I. So far as management practices in calves are concerned, none of them practiced weaning, dehorning and vaccination at 4-6 months age for Brucellsis and Anthrax. However,
the facilities like bank loan, electricity were hardly available to many of the farmers. The feeding management of dairy animals indicated that most of the farmers used home made ration consisted of rice-bran, grain and oil base. Fodder cultivation for the cattle is hardly practiced in the area under study. They also suggested that attempts should be made for motivating farmers to adopt modern practice of management in respect of A.I., management practices in calves, dairy animals, their feeding management and sanitation to improve the milk yield as well as economic status of the farmers in the zone.

Goerge\textsuperscript{14} (1996) has expressed that the livestock economy appearing mainly in the IJAE and elsewhere indicates some major tendencies. In contrast to the earlier emphasis on dual-purpose animals, there is a growing tendency towards keeping specific animals for work and milk production. While bullock is maintained as a work animal, the bullock population is somewhat stabilized. Buffaloes and crossbred cows are maintained for milk production with certain regional specialization. There has been significant progress in terms of building up infrastructure facilities for marketing milk and evolving new technologies on breeding and allocation of resources. Cooperative institutions have evolved as a major force in milk marketing and providing necessary support facilities to the farmers. The livestock sector’s importance to the national economy is also increasing; and this sector has significant potential for creating income and employment opportunities in the rural areas.
Shiyani\textsuperscript{15} (1996), analyzed the dry land area of Saurashtra, which would be useful not only to the cooperative sector, but also to the public and private sectors for improving their efficiency. Four dairy co-operatives were selected at random from the Junagath District Co-operative Milk Producers Union (JDCMPU) and a total of 131 members and non-members of milk producers were selected from the villages covered by these co-operatives. The total milch buffaloes and cows owned by the members were 139 and 64 respectively, while the corresponding figures for non-members were 117 and 78. To examine the impact of dairy cooperatives, the relevant data were collected and analyzed separately for three seasons, such as rainy season (July to October) winter season (November to February) and summer season (March to June). The survey covered the agricultural year 1992-93.

The hypothesis that the estimated milk production function for the members was significantly different from that of non-members was accepted. This implied that the membership status of dairy cooperatives and the structural break in the production relations has shifted the production function.

The results of this study revealed that the “Anand Pattern” in regions with an ecosystem akin to that of Saurashtra would be beneficial to the rural milk producers. The empirical results of the decomposition analysis revealed that the impact of dairy co-operatives
on milk field was found to be positive both in the case of buffaloes and cows milk production. The role-played by the dairy cooperatives in providing balanced cattle feed as well as regular and efficient veterinary services to their members was quite appreciable.

Krishnan\textsuperscript{16} (1997) examined different aspects of dairy scheme implemented by a rural bank in Kerala. The development of dairy activity is central to the rural development of our country. By understanding this point, Regional Rural Banks in Kerala have been providing credit for the purchase of milch animals in the command area on a large scale for the last so many years. It studied the production and productivity of milch animals, impact of dairy scheme on employment and income generation and also the repayment behaviour of dairy loan beneficiaries. It has found that the dairy scheme has positive impact on income and employment generation.

Bijai Kumar, Singh and Singh\textsuperscript{17} (1997) study reveals that most of the borrower households are found to be defaulters. It is also reported that gross income generated by non-defaulter group in both category is higher compared with defaulter group of same category. Average return is found favourable. Repaying capacity is favorable for non-defaulter as compared with defaulter group of some category. The borrower households did not have adequate risk bearing ability. It is even negative in case of defaulter group of marginal farmers. Net present value showed to be positive in all cases, thus showing
favourable situation for dairy enterprises. Benefit cost ratio is also more thus indicating favourable situation for dairy investment.

Prabhakara Sharma\textsuperscript{18} (1997) emphasized that the Godavari Cooperative Dairy for the expansion programme, is highly essential to improve the financial viability and self-financing ability. He opined that the very purpose and spirit of the cooperative movement is defeated. The successful operation of the Godavari Cooperative Dairy depends largely on the ability to serve the consumers in the best possible manner by reducing fixed cost burden.

The Directorate of Economics and Statistics, Ministry of Agriculture, Government of India had undertaken a study entitled: “Production and Utilisation Pattern of Milk at the Rural Producers’ Level” across the regions through its AER centres of the respective regions. Accordingly, the study has assigned to one State from each of the four zones – north, west, east and south for an all – India representation. Thus, the study was undertaken by Waltair, Bhagalpur, Vallabhvidyanagar, Delhi and Vishwa-Bharati AER Centres for Andhra Pradesh, Bihar, Gujarat, Punjab and West Bengal States.

The broad objectives of the study are:

(i) To estimate the milk production, retention, conversion of milk into ghee, white butter, khoa/mawa, curd etc. across seasons (Lean and Flush).
(ii) To study the relative returns from milk conversion vis-à-vis sale of milk in liquid form.

(iii) To study the existing marketing channels adopted by the producers for disposal of milk products.

In consultation with NDDB, a multi-stage sampling design was followed for selection of households. At the first stage of sampling, the selection of districts was made. The districts were duly classified for each of the selected states into two broad categories viz., ‘developed’ and ‘less developed’ by the NDDB. The categorization of the districts were made on considerations like milk procurement per poorer member, percentage of villages covered under village milk cooperatives and possibility of organized programme intervention. Accordingly, the districts of Visakhapatnam, Muzaffapur, Vadodara, Ludhiana, Murshidabad in developed category and Krishna, Samastipur, Bharuch, Bhatinda and Midnapur in less developed category were selected in Andhra Pradesh, Bihar, Gujarat, Punjab and West Bengal, respectively. The reference period of the study was 1996-97 starting from November, 1996 to October, 1997. It was divided into three distinct seasons viz., Winter (Nov. to Feb.), Summer (March to June) and Monsoon (July to Oct.) However, except in Punjab where the data were collected only for two seasons, Viz., rainy and winter; the primary data from other
concerned States were collected for all the three distinct seasons.

As per study design, 300 households were to be covered in each of the concerned States. The size of sample in Bihar, Gujarat and West Bengal was in accordance with the suggested number but it was only 150 in Andhra Pradesh and 240 in Punjab. Thus, a total of 1290 households forms the size of sample of the present consolidated study. Of the total 1290 sample households landless and marginal farms account for 39.38 per cent, small farms 33.95 per cent and large farms 26.67 per cent. The proportion of general castes was highest, i.e., 56.67 per cent followed by 27.36 per cent for OBC, 11.55 per cent for SC and 4.42 for ST.

Milk Utilisation Pattern:

(i) Of the total milk production, the sale ranged between 53.27 per cent to 82.75 per cent and retention between 17.25 per cent to 46.73 per cent across the States.

(ii) The sale was to the extent of 82.75 per cent in Andhra Pradesh, which is higher compared to other States; followed by 80.11 per cent in West Bengal, 78.17 per cent in Gujarat, 78.00 per cent in Bihar and 53.27 per cent in Punjab.
Marketing of Milk:

(i) The milk sales were effected through (a) Dairy Cooperative Societies (DCS), (b) Village Families (VF), (c) Milk Vendors (MV), (d) Others (OT) which include private dairies, town families, halwaiwala etc.

(ii) Of the total milk quantity sold, the sale was ranging between 41.96 per cent to 63.07 per cent to DCS, 2.52 per cent to 15.01 per cent to VF, 16.37 per cent to 31.70 per cent to MV and 4.00 per cent to 29.46 per cent to OT.

(iii) The sale to DCS was higher in Gujarat i.e. 63.07 per cent of the marketable surplus followed by 53.25 per cent in West Bengal, 50.32 per cent to Bihar and 41.96 per cent in Punjab.

Marketing Problems:

Lack of good condition of road, faulty system of weights and measurement and testing of milk, exploitation by middleman, functioning of DCS merely as a milk collection centre, delay in payment, etc., were the most prominent problems faced by the sample households across the states.

Singh and Arjun Prasad\(^{19}\) (1998) expressed that in the organization of cooperatives, coverage of membership and milk collection, dairy cooperatives failed to exert any positive influence on the bovine mix, milk production and consumption on participant
households. There has been a reflection of organization of socio-economically weaker sections of the society in Bihar. The landless and lower caste house-holds, failed to get due share in organizational positions and decision making process. Dairy cooperatives failed to create awareness about managerial participation amongst their members. The long tenure of secretaries is likely to create a group of “vested interest” in dairy cooperatives, which will be detrimental to the system.

Rajendran and Prabakaran\textsuperscript{20} (1998) analyzed that India’s agriculture is dominated by the belief that its base is crop production. Its importance is beyond question, since food grains fulfill the first basic need by providing calories to the population. Having achieved a measure of self-sufficiency in cereal production, attention is now necessary for nutritional security and economic access to food. They also focus on the need to be shifted from quantity to quality in our dairy diet by means of enhancing the intake of animal proteins, the major sources of which included milk, eggs and meat.

In recent years, an unfortunate trend is experienced namely the decreasing per capita availability of pulses. This is the only major source of protein to a majority of the population. The protein gap in the nutritional demand needs to be bridged soon. To this effect, the milk, eggs and meat provide affordable alternative sources of protein.
Virender Singh and K.N. Rai (1998) examined the economics of production and marketing of Buffalo Milk in Haryana. Specific objectives of the study are: (1) to work out the economics of milk production, (2) to find out the break-even point of dairy enterprise, (3) to study the factors affecting marketed surplus of milk of members and non-members of milk co-operatives in the state, and (4) to study the economic efficiency in milk marketing through co-operative and private sectors of the state.

Hisar and Kurukshetra districts were selected from Zone I and Zone II respectively. From each of the selected districts, two tehsils, viz., Hisar and Hansi from Hisar district and Pehova and Thanesar from Kurukshetra district were selected randomly applying the probability proportion to size (PPS) technique where the population of buffaloes acted as size. From each of the selected tehsils, one village was selected randomly making a total of four sample villages. From each selected village, 50 respondents were selected representing three size-groups proportionately.

The study found that the feed and fodder cost was the most important item of the total maintenance cost accounting for 58 to 68 per cent of the total in Zone I and 52 to 67 per cent in Zone II. The net profit per day of a milch buffalo was very low due to the higher maintenance cost and low milk yield of milch buffalo on each herd size-group in each zone of the state. The net profit from milk production per buffalo per day was observed to be higher in the case
of small size-group due to higher milk yield of milch buffaloes in this size-group as compared to medium and large herd size-groups in both the zones. However, all the herd size-groups in each zone were operating above the break-even levels. But the average yield in most of the farms was very near to the break-even point making them vulnerable to fall below with minor change in milk yield and its prices/price of feed and fodder. Price of milk was found to be the most important factor influencing volume of milk business significantly, besides production level. The establishment of milk co-operative societies in the rural areas had positive impact on the marketed surplus of milk.

Deepti Saxena and Hema Tripathi\textsuperscript{22} (1998) studied entrepreneurial behaviour of milk producers according to their social, personal, economic and psychological attributes in women’s dairy cooperatives. The study was carried out in Bareilly district of U.P. which was selected purposively due to existence of Bareilly Dugdh Utpadist Sahkari Sangh Ltd. Entrepreneurial behaviour (EB) was found significantly higher amongst those who belonged to middle age group and higher castes. It was found significantly lower amongst landless rural women as compared to women belonging to the medium, small and large farmers’ categories. EB of rural women increased with increase in the standard of family education. EB of respondents with higher level of milk production differed significantly from that with low and medium levels of milk production. The study
would be helpful to the planners, researchers, trainees, cooperatives and all those interested in understanding the entrepreneurial traits to further boost the spirit of entrepreneurship among women, keeping in view the social, personal, economic and psychological attributes influencing their entrepreneurial behaviour.

Verma’s\(^{23}\) (1999) study found that the average procurement cost during 1994-95 was Rs.1.07 per litre, with major share being of average transportation cost at 39.2 paise per litre. The variable cost accounted for 92.3 per cent, as the transportation of raw milk was on private contract basis. The average processing cost in the dairy was Rs.1.167 and Rs.1.15 of toned and double toned milk manufactured in the dairy. The cooperative dairy earned an average margin of Rs.1.87 per litre of toned milk and Rs.0.94 per litre of double toned milk. The average distribution cost was 22.3 paise per litre of market milk with hiring charges for transportation alone accounting for 80.7 per cent of the distribution cost.

Singh & Choudhary\(^{24}\) (1999) study focuses on different aspects of milk economy of Bihar under ‘Operation Flood Programme’ (OFP). Two out of nine milk sheds functioning under OFP during 1990-91 were taken into consideration in this study. These include (1) K.B. Barauni Dugdh Utpadak Sahkari Sangh Ltd. And (2) Vaishal – Patliputra Dugdh Sahkari Sangh Ltd., covering 11 districts. A sample of 60 milk co-operative societies, 30 from each union were selected for the study. The major issues examined by the authors in this study
includes (i) growth of dairy cooperatives vis-à-vis growth of bovine population over the years, (ii) financial and managerial status of the local DCS, (iii) performance of milk producers in the field of production and marketing of milk, (iv) adequacy and efficiency of the support system for providing livestock services and (v) socio-economic characteristics of the DCS and constraints.

Reema Nanavathy\textsuperscript{25} (2000) has expressed that today, based on SEWA’s experience, women have proved that they are not only participants but also join hands with organizations in mainstreaming women in the dairy sector. Recognize women’s contribution in the dairy sector, and encourage formation and registration of women’s dairy cooperatives. There is need to promote women managed Fodder Banks, to strengthen and stabilize the dairy cooperatives in the dry districts of North Gujarat, especially Kutch, Banaskantha and Surendranagar, where dairying is the next major occupation to agriculture. There is a need to adopt a strategy of decentralization to combat privatization and globalization, promote cooperative managed small scale chilling plants and processing plants. This will lead to massive growth of trade and business through the cooperative network, provide means of livelihood and lead to regeneration of economy and ecology in Gujarat.

Sanjib Kumar Hota\textsuperscript{26} (2000) expressed the co-operative movement of India, which has a vast rural network; the rural market is the main target for cooperative business. In order to maintain
increasing market share in rural areas, the cooperative sector has to explore many new fields and maintain existing status of the business smoothly in the rural market. In course of the increasing process of economic liberalization there is a probability of more competition to be faced by rural cooperatives.

Brajesh Jha\textsuperscript{27} (2000) has expressed that his study found that Indian Milk Products are not competitive in the world market, though milk price in India is one of the lowest in the world. This calls for improving efficiency in processing of milk and milk products in the country. He also expressed that in the long run imperfections in World Dairy Market will reduce, and competitiveness would be the key to the world market. Therefore, dairy policy should be tailored to enhance efficiency in the domestic dairy sector.

Shantanu Kumar and Uma Sah\textsuperscript{28} (2000) explained various parameters of dairy development. Power (1983) also found poorest dairy development index in the State of Orissa (2,856.7) as compared to Punjab (8,821.3). Bovine density, cattle-buffaloes ratio, crossbred population, number of cooperative societies and producer members per society and milk procured per society per day, A.I. routes per 1,000 breedable bovine population, cattle feed production and productivity of milch animals were found as an important decissive indicators responsible for imbalance in dairy development in different regions.
The study also revealed that Eastern region, though having enough bovine resources, is still lagging behind the other regions and thus indicating a lot of scope for improvement. The high stocking rate should be recognized as the strength and opportunity, rather than a threat.

Surya Murthi\textsuperscript{29} (2001) has expressed that milk production can be improved substantially with minimum cost through crossbreeding in case of cows and selective (upgrading) breeding in case of buffaloes, scientific and least-cost effective feeding practices, prevention and control of disease measures and judicious management apart from assured market for milk. The steps taken to improve dairy farming will provide not only constant and regular gainful employment but also assured income to farmers/landless labourers in rural areas, which, in turn, improves the standard of living of people in rural areas.

Mallikarjuna Reddy\textsuperscript{30} (2001) expressed that crossbreeding of cows should be carried out on all the irrigation zones of the country, while grading up of buffaloes with Murrah breed should be limited to high irrigation and medium irrigation zones.

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respective regions. Accordingly the study was assigned to one State from each of the four zones – north, west, east and south for an all-India representation. Thus, the study was undertaken by Waltair, Bhagalpur, Vallabhvidyanagar, Delhi and Vishwa-Bharati AER Centres for Andhra Pradesh, Bihar, Gujarat, Punjab and West Bengal States. It is in this background, the present report presents a consolidated results of the study conducted by concerned AER centres for their respective States. The broad objectives of the study are (i) to estimate the milk production, retention, conversion of milk into ghee, white butter, khoa/mawa, curd etc. across seasons (Lean and Flush), (ii) to study the relative returns from milk conversion vis-à-vis sale of milk in liquid form, (iii) to study the existing marketing channels adopted by the producers for disposal of milk products.

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As per the study design 300 households were to be covered in each of the concerned States. The size of sample in Bihar, Gujarat and West Bengal was in accordance with the suggested number but it was only 150 in Andhra Pradesh and 240 in Punjab. Thus, a total of 1290 households form the size of sample of the present consolidated study. Of the total 1290 sample households landless and marginal farms account for 39.38 per cent, small farms 33.95 per cent and large farms 26.67 per cent. The proportion of general castes was highest, i.e., 56.67 per cent followed by 27.36 per cent for OBC, 11.55 per cent for SC and 4.42 for ST. Of the total milk production, the sale ranged between 53.27 per cent to 82.75 per cent and retention between 17.25 per cent to 46.73 per cent across the states. The sale was to the extent of 82.75 per cent in Andhra Pradesh, which is higher compared to other States; followed by 80.11 per cent in West Bengal, 78.17 per cent in Gujarat, 78.00 per cent in Bihar and 53.27
per cent in Punjab. The milk sales were effected through (a) Dairy Cooperative Societies (DCS), (b) Village Families (VF), (c) Milk vendors (MV), (d) Others (OT) which include private dairies, twon families, halwaiwala etc. Of the total milk quantity sold, the sale were ranging between 41.96 per cent to 63.07 per cent to DCS, 2.52 per cent to 15.01 per cent to VF 16.37 per cent to 31.70 per cent to MV and 4.06 per cent to 29.46 per cent to OT. The sale to DCS was higher in Gujarat i.e. 63.07 per cent of the marketable surplus followed by 53.25 per cent in West Bengal, 50.32 per cent to Bihar and 41.96 per cent in Punjab. Lack of good condition of roads, faulty system of weights and measurement and testing of milk, exploitation by middlemen, functioning of DCS merely as a milk collection centres, delay in payment, etc., were the most prominent problems faced by the sample households across the States. Tiwari and H.P.S. Arya (2001) have observed that the milk cooperative societies are more successful in remote areas where there is no better alternative to those nearer to town or city. The society should have been trained in the rules and regulations of the society as this would help in checking the malpractices and corruption which led the society to become defunct. Thus, it can be concluded from the findings of this comparative study that cooperative movement is more successful where there is a lack of infrastructure facilities available to the villagers and where there is a lack of diversities in occupations as alternative avenues for income generation are limited.
Kadirvel³³ (2002) says that in rural areas, lack of awareness about clean milk production is further accentuated with obsolete technology when compared to the West. Such factors related to hygiene reduce the quality of our milk products resulting in low demand for our dairy products in the world market.

Mallikarjuna Reddy and Subramanyam³⁴ (2002) analyzed the gap between the potential and the realized yields of dairy animals maintained by the farmers. The decomposition of the yield gap into its contributory factors reveals that the sound management practices and increased input use (better feeding) are the factors responsible for the yield gap in crossbred cows and Murrah buffaloes. The contribution of management accounted for 20 per cent and contribution of feed accounted for 33 per cent of the change in milk production of crossbred cows consequent upon a shift from farmer level practices to farm-level practices. In the case of Murrah buffaloes, the contribution of management is as low as 3.4 per cent while the contribution of feed is as high as 33.6 per cent of the total gain in milk production. Therefore, both management and feed are important for enhancing the milk productivity of crossbred cows while only feed is important in the case of Murrah buffaloes.

They also examined of feeding patterns of animals in both the situations. The study has indicated that the deficiency of protein in the rations of the farmer-bred animals is the important factor responsible for the lower milk productivity of farmer-bred animals.
Therefore, it is suggested that all the farmers should include protein rich feeds in the ration of their animals. Further, all additional use of the micronutrients like mineral mixtures and vitamin supplements in small quantities improve the daily milk yield and lactation length of farmer-bred animals.

Agro-Economic Research centre\textsuperscript{35} (2002) attempts to examine the ‘efficiency status’ and competitiveness of Indian dairy industry and to analyze the factors responsible for competitiveness of this industry. Such analysis can provide a valuable information for undertaking appropriate measures to guide the process of globalization to enable the industry maximize its gains from trade liberalization and minimize adverse effects. The issues, which are specifically addressed in this study, are: (i) How the Indian industry has performed in terms of production, consumption and trade during the last 50 years and what are the future prospects and challenges?, (ii) What is the level of efficiency in milk production and processing sectors and what factors affect the efficiency at farm-and firm-levels?, (iii) Is the Indian dairy industry internationally competitive in an open economy environment and what is the impact of various sources that influence competitiveness in the industry? What are the factors within the control of the Industry and the nation and which are outside their control?, (iv) What are the main provisions of the AoA under WTO and likely impacts of these new rules on world trade of dairy sector? Whether it has been successful in reducing barriers to trade and
market distortions and what the problems that have emerged during the implementation of AoA?. The data for milk production sector of this study comes from a random sample of 150 farmers (50 from Punjab, 54 from Gujarat and 46 from Maharashtra) collected through survey method during 1998-99. The analysis of performance of Indian dairy industry indicates that there has been a significant increase in the production of milk (about 4.5 per cent per annum) over the last two-and-a-half decades, broadly from early 1970s to the late 1990s. The major impetus behind this change came from successful implementation of Operation Flood programme and other dairy development programmes implemented by the State and Central Government. India is the largest producer of milk in the world but a minor player in the international trade. Export of dairy products from India is negligible compared to both its own domestic production and international trade. The result of efficiency in production and processing sectors indicate that, on an average, Indian dairy farmers are efficient with average technical efficiency score (under VRS) of 85.4 per cent under parametric approach and 83.7 per cent under non-parametric approach. The results of competitiveness analysis reveal that protection to SMP was lower than WMP and butter in all the years. The NPC values were less than unity during all the years except 1999, while the value of NPC for WMP and butter was above unity in all the years. World milk production for 1999 is estimated at 560 million
tonnes, up 1 per cent from 1998 and is expected to rise to 615 million tonnes by 2005. The largest increase is expected in developing countries increasing their share from about 35 per cent in 1993-95 to 41 per cent in 2005. Strong production growth in the United States, India, China, Argentina and Australia accounted for most of the global growth.

Thus a major policy implication of our study is that Indian dairy industry is highly competitive but must be protected from distored and unfair trade competition in a liberalizing economy environment. Indian diary industry and the government should take some positive and concrete steps to increase productivity levels and improve quality of dairy products conforming to international standards to tap the potential in the world market.

Kiresur (2002) found that dairying is the very important subsidiary occupation to raise the family income along with crop production particularly for small and medium farmers. In the study area small farmers realized greater income with low cost of milk production in all types of animals than medium and large farmers even though operating cost was on the higher side in this category comparatively. As returns were much higher in the small and medium farms, it was better supported by family income. Cost of feeds and labour consisted accounted for 26.53 per cent in the variable cost.
Mahfoozur Rahman, et al\textsuperscript{37} (2003) emphasized the cooperative dairying and rural marketing. The cooperative dairying is an agency, which carries on production and marketing of milk and milk products on behalf of the producers who are unable to earn even the marginal profit. In India cooperative dairying is another productive activity, which is the most outstanding form of agricultural operation.

Rizwana’s\textsuperscript{38} (2003) study explains that dairying is one of the key activities of rural women. Operation of all women dairy cooperatives is a unique feature of dairy scenario. In Kolar district (Karnataka) 50 such units are operating. A number of agencies are involved in promoting/nurturing this sector, though no specific interventions are being made by any agency to women cooperatives vis-à-vis mixed cooperatives or all male cooperatives. Kolar Milk Union (KOMUL) is a key player among them. Though there is a little resistance to form an all women dairy cooperative in a village, mainly due to the current policy of KOMUL to have only one milk cooperative per village, KOMUL is contemplating to go ahead and add a few more, as the atmosphere is gender sensitive and women have proved equally good managers of cooperatives. Women make sure of sale of milk twice a day and 365 days a year deriving good benefits from a milk cooperative in the village. Women also acknowledge the animal health care and other inputs (as other valuable inputs) to boost milk by KOMUL. By being members/operators of the cooperative, women have better control over family income, opportunity to manage an IGA, better time
management capability and have overcome some of the social barriers. The amendment to the State Cooperative Act in 2000 has also helped the cooperatives in a positive way.

Sanjeev Chopra\textsuperscript{39} (2004) has analyzed the issues and challenges confronting cooperatives. He has examined the dairy network or the Amul Pattern, as it is popularly known as the agricultural credit delivery system. He also points out that in the present circumstances the primary concern of the cooperatives is not with production but value addition and marketing. The challenges they face are from within and from the newer players that have started entering their new areas. He has suggested that the future depends on whether the cooperatives are able to transform themselves into self-reliant and mutually aided units in which the members fare quick enough to adapt and adjust to the changing business environment.

Vir Singh and Jyoti Sharma\textsuperscript{40} (2004), emphasized that Women Dairy Development Projects seek to address many issues under specific environmental, socio-economic and cultural setting of the mountain areas of Uttarakhand. Constituting Women Milk Producer’s Co-operatives and forums of those women’s who are below poverty line, the project, commonly called Women Dairy, is ensuring large-scale active participation of women folk who constitute the main axis of Uttarakhand agriculture, animal husbandry and other land-related activities. Elaborating the basic infrastructure of the prestigious project, they also examined the several contributions of women dairy
to the amelioration of overall livestock-based socio-economic situation in Uttaranchal.

Amrita Patel\textsuperscript{41} (2004) has expressed that the priorities are the change of focus from curative to preventive healthcare, disease tracking and control including setting up of disease control zones, rightsizing biological production units, and enactment of the long overdue prevention of Infectious and Contagious Diseases.

Rao V.M.\textsuperscript{42} (2004) studied the Indian Cooperative Movement with particular focus on the role of women in it. He also examined implementation of Support to Training and Employment Programme (STEP) for women with special reference to Women’s Dairy Projects and its impact on Rajasthan Women’s Dairy Project. Further, he points out that ‘all women’ cooperatives form only 2 per cent of the total number of Cooperatives in India despite the fact that there are a number of successful cooperatives owned, controlled and managed by women.

Vinay M.R. and Manjappa D.H.\textsuperscript{43} (2004) say that the Dairy Cooperatives produce both “Public Goods” and “Private Goods”. They also examined excludable benefits and non-excludable benefits for members. Excludable benefits can be offered in a way that only members can consume them. Those members who use the benefits pay the cost of producing them and only they benefit. All producers regardless of whether or not they pay the costs incurred by the
cooperatives can consume non-excludable benefits—once produced. They also point out that the most interesting and significant effects of the milk cooperatives in India are social changes that the movement has ushered. Since these cooperatives are governed only by a democratic system, it has not only inculcated in the farmers a more democratic approach to life’s problems, but also increased their awareness of their rights in society.

Kurien (2004) has expressed that the government should ensure that the control over the management of the cooperatives remains in the hands of genuine stakeholders, the farmers. Only then the dairy cooperatives can continue to play vital role of creating a socio-economic revolution in rural India.

Param Pal Sahota et al. (2004) expressed that milk is complete food in itself but is being adulterated risking human health. It may contain biological or chemical adulterants advertently added by milk handlers. Thus it is imperative that the consumer is made aware of the nature of adulterants and means of detecting them.

Singh (2004) explained that the climatic conditions of Uttarakhand is quite suitable for providing homo-climatic conditions for the European cattle or cross breeds in the state but there are some constraints, which may be overcome. The improvement strategies are here at length.
Dang, Neeta Sapra and Gursharan Kaur\textsuperscript{47} (2004) argued that the dairy Industry in India is going through major changes with the liberalization policies of the government and the restructuring of the economy. Indian dairy industry is heading towards an accelerated and positive momentum. With unprecedented growth in milk production during last 30 years, India has emerged as the largest producer of milk in the world. This has brought greater participation of the private sector. They were also consistent with global trends, which could hopefully lead to greater integration of Indian Dairying with the world market for milk and milk products.

Bhanj and Hema Tripathi\textsuperscript{48} (2004) discussed in detail the wide range of opportunities available in dairy development like rural employment and income generation, export potential, processing, infrastructure, demand for milk, genetic diversity, buffalo as dual-purpose animal, cooperative dairying and excellent HRD and other facilities etc. While there are great opportunities thrown upon dairy development, the challenges faced by dairy sector also varied. They also emphasized the needs of additional efforts to meet the challenges. Serious efforts are needed to be made towards judicious control of dairy cattle population, extending the existing A.I. network and improve its quality of service, strong extension linkages and input delivery system through extension support, genetic upgradation of cattle to enhance productivity, improvement in quantitative and qualitative availability of feed and fodder, control of epidemics,
adequate budgetary support, revising of milk pricing at regular intervals and effective procurement network. A good dairy husbandry network is sure to change the socio-economic scenario of the country. Though, opportunities are in abundance and avenues are unlimited, only thing is to select the right path at the right time for the right people.

Dang, et al (2004) study examined the Indian Dairy Industry changing scenario, its problems and prospects in a detailed manner. The study found that delicensing of milk processing was among the first few initiatives taken by India when it embarked upon the process reforms in 1991, though it subsequently promulgated a ‘Milk and Milk Products Order’ to regulate the production, supply and distribution of milk to ensure adequate availability of fresh liquid milk for the general public, the delicensing move gave the much needed impetus to the dairy products industry. A number of new projects for processing of milk and milk products have either already come up or are in various stages of implementation. This has created conditions conducive for a booming dairy sector economy to sustain India’s position as the world’s largest milk producer. The future of India’s dairying will no doubt be a high-tech one, although its base will continue to be in the hands of vast number of small rural producers, scattered across the country.
Dayakar Rao and S. Hyma Jyothi\textsuperscript{50} (2005) study examined (i) the costs and returns in milk production, (ii) the input-output relationship in milk production and (iii) the constraints associated with milk production. The study has carried out in Guntur District of Andhra Pradesh. Two villages are selected from one Mandal and a total of 30 local cow, 30 crossbred cow and 30 buffalo milk producers were selected.

The data was collected from three types of milk producers regarding the quantity and price of green fodder, dry fodder and concentrates fed per animal per day; labour used in the process of milk production and prevailing wage rates of hired labour, milk yield and its sale price during the year 2002-2003 with the help of pre-tested and well structured questionnaire. The results show that, the value of coefficient of multiple determination ($R^2$) was more than 90 per cent in all the three milk productions. This indicates that more than 90 per cent variation in dependent variable (Gross returns) was explained by the five selected independent variables. Except for independent variable, it was more when compared with local cow and crossbred cow milk. For realization of high net returns from local cow, crossbred cow and buffalo milk production, the milk productivity levels of animals should be enhanced through sustained breed improvement programmes. The milk production could be appreciably enhanced by increased use of concentrates and green fodder in the Guntur District.
Prabhat Kumar Pankaj et. al\textsuperscript{51} (2005) study finds that Buffalo contributes largest to the milk production with about 46.5 million tonnes (55 per cent) followed by indigenous cows with 18.3 million tonnes (24 per cent) and crossbred cows, with 13.5 million tonnes (16 per cent). Goat contributes 4.2 million tonnes (5 per cent). In 2003-04, the production of milk in the country was 88.1 million tonnes, of eggs 34 billion nos., of wool 53 million kgs. Dairy development in India has been acclaimed world over as one of the modern India’s most accomplished developmental programmes. The states like Gujarat, Maharashtra, Uttar Pradesh, Haryana, Rajasthan, Andhra Pradesh, Karnataka and Tamil Nadu are surplus in milk production. Productivity performance of dairy industry across the country has registered an annual growth of 17.1 per cent for the country as a whole with highest market share of 23.5 per cent for Maharashtra followed by Gujarat (17.2 per cent). The consumption pattern indicates that 45 per cent of milk is consumed in liquid form, while butter milk/separated milk (butter and ghee) constitute 34 per cent. India has a negligible share in world trade in livestock products. During the triennium ending 1998, the average value of livestock product exports was Rs.13500 million per annum, which was only 1 per cent of the total export earnings and 6.2 per cent of the agricultural export earnings. Indian export in dairy products is limited only to butter and ghee and negligible quantities of skim milk powder and whole milk powder. Dairy and poultry products showed a
record increase of over 65 per cent in US dollar terms in 2004-05 as compared to previous fiscal year.

Dixit, et al\textsuperscript{52} (2006) study was carried out in Kerala during 2003 eliciting the required data from 750 dairy farmers representing 5 agro-climatic regions of the state. The main feature of bovine composition in Kerala is that crossbred cattle constitute about 75 per cent. The fixed cost constituted about 7–8 per cent of the gross cost of milk production by milch bovines across zones, while, feed cost accounted for 55–60 per cent of the gross cost. The imputed labour cost formed 28–34 per cent of the gross cost. The milk production cost per litre varied from Rs.9.86 (for crossbred cow) to Rs.21.96 (Non-descript cow). In majority of the cases, the net returns from milk production per households varied between 4.22 litres and 9.78 litres. The marketed surplus of milk varied between 77 and 86 per cent of the production. Establishment of fodder banks, improved facilities of veterinary and health care services, banking services, dairy cooperatives for realizing remunerative prices are crucial for dairy development in the state.

Anand Lodade\textsuperscript{53} (2006) study is micro-level case study of milk producing activities in “Dharpudi” village. The data regarding total milk production has been collected from two dairy co-operative units, i.e., Shramik Sahakari Dugdh Vyavasaik Sanstha and Vithal Mahila Sahakari Dugdh Vyavasaik Sanstha. The live-stock data is collected
from live-stock census. The study of changes in price index of cattle feed and veterinary medicines is based on the local price.

The study found that the positive approach regarding the profitability, gainfulness in dairy farming is spreading among the villagers. The milk producers have realized the importance of holding the hybrid cow and high productivity buffaloes for more milk and dairy business. The unfavourable and adverse conditions in dairy farming can overcome through self initiations. Interest rates on credit supply available to buy dairy cattles is still higher compared to the other sector. It was 16 per cent for buying the buffaloes in villages in 2005. The higher interest rates increases the capital cost and hence more milk producers do not attract towards dairy farming. It is observed that still many milk producers are not interested and prompt about the construction of a cow-pens. There is no awakening regarding the proportional composition of green and dry fodder to dairy cattle among the milk producers. The rates and remuneration price of milk of both cows and buffaloes are lower compared to the cost of milk production.

Karmakar K.G and G.D. Banerjee\textsuperscript{54} (2006) study examines the Opportunities and Challenges in the Indian Dairy Industry. This is explained in terms of policy, milk processing, domestic competition, trade etc. The key areas of concern of dairy industry such as (i) Competitiveness, cost of production, productivity of animals etc, (ii) Production, processing and marketing infrastructure, (iii) Focus on
buffalo milk based speciality, (iv) Import of value-added products and export of lower value products, and (v) Provisions of SPS and TBT are discussed. Further, this study visualises the new challenges of Globalization and trade Liberalization 2010 at length.

Sikka, P. et al\textsuperscript{55} (2007) conducted survey in Jind district in Haryana state. A farmer’s welfare trust, established by the Punjab National Bank (PNB) started their training centres in five different states. Saccha Khera, the first centre established in district Jind, conducted a survey over a group of women trainees comprising respondent sub-population of sixty farm women, randomly selected in the village. Age profile of these women comprised of all the categories including, young (40 per cent), old (27 per cent) and middle aged (33 per cent). Family land holding of 1 to 1.5 acres was commonly owned by 80 per cent of these women. The family herd profile consisted of 3 to 5 buffaloes per family in 42 per cent cases. About 25 per cent were having 5 and more and 30 per cent still had less than 2 buffaloes per family. Seventy percent of the respondents were able to produce 10 kg milk per day for sale. Rest (30 per cent) of the farmers were able to sell more than 10 kg per day. The study found that women play a key role in animal, farm and home management. The study revealed that more than 8 working hrs in a day are spent by women, covering all the buffalo rearing practices. Buffalo rearing covers more than 50% of the working hrs of women in comparison to 10% of the working time of their counterpart, the men. Gender differential was noted
significantly while documenting various husbandry practices for buffaloes. Respondents described all the activities being undertaken as cleaning of sheds, dung disposal, and animal care at the time of calving are carried out solely by women, hence characterized under the heading of monopolizing role of women as per the classification system given by Shekhawat and Meena, 2005. Watering animals, milking, bathing, feeding are the roles dominated by women and shared by their counterparts at a small level. Fodder harvesting and its chaffing are included in the same list.

Koteswara Rao, M et. al\textsuperscript{56} (2009) study analysed the data on Lactation effect over milk yield. Bull sets vs seasons and seasons vs lactation is observed. Lactations 1, 2, 3, 4, 5 and above are considered in their study. The milk yield increases from lactation to lactation up to certain stage, the production of milk yield get constant from 5\textsuperscript{th} & above lactations. The production of milk yield is high from December to March when compare to the other months and these aspects are found in the present study.

Debnarayan Sarker and Bikash Kumar Ghosh\textsuperscript{57} (2010) study has explored the major constraints that both cooperative and non-cooperative dairy farms face in expanding milk production in the state of West Bengal. The underlying hypothesis is that the non-cooperative farms face major constraints and high severity compared with cooperative farms in expanding milk production. Four sample PMPCSs are selected for this study. The study revealed that financial
problem is the most significant constraint faced by the cooperative farms. The study has revealed that to manage the financial problem two types of institutional credit should be provided simultaneously by the cooperatives. One, the recovery of previous loan should be made on long-term basis at a lower rate of interest. Two, adequate institutional credit at a low interest rate should be provided to the attached farms immediately for purchasing the necessary inputs like high quality cross-breed of milk cows along with required amount of cattle feed, fodder and mineral mixture, improved dairy equipments, etc., for expanding milk production. For managing infrastructural constraints, two types of policy implications are necessary. One: on short-term basis, proper medical training on veterinary medicine should be given to the main employee of each cooperative society who is acting as a veterinary physician without any degree or diploma on veterinary medicine. Two: on long-term basis, the dairy cooperative laws and regulations should be amended in such a form that registered veterinary medical practitioners will be obliged to practice in the rural areas.

To manage marketing constraints, cooperative societies should provide precise and detailed information on marketing facilities (milk collection, processing and distribution) to their attached farms in time, strengthen marketing infrastructure and exercise proper management practices through regular meetings with their attached farms. For managing technical constraints, special training facilities
should be provided to the attached dairy farms at regular intervals immediately. To manage socio-psychological constraints, employment of additional man power for milk collection and transportation during busy season of agricultural year and holding of regular meetings of the members of cooperative farms at the cooperative society level should be done.

Anjani Kumar, et al\textsuperscript{58} (2010) study was undertaken with the objectives of (i) examining the costs and returns in traditional milk marketing and processing, (ii) estimating the milk producer’s share in consumer rupee and marketing margins of different actors in the marketing chain, (iii) assessing the potential of traditional milk market in employment generation, and (iv) identifying the factors for scaling up the volume of business of the informal milk market agents in the state. The data were collected from representative random samples of traditional milk market agents in the state of Assam by conducting a survey in nine of its districts, viz., Barpeta, Kamrup, Sonitpur, Nagaon, Morigaon, Jorhat, Tinsukia, Cachar and North Cachar Hills. Eight of these are the target districts of the Assam Agricultural Competitiveness Project (AACP), of which dairy development is a component. One of the districts, viz., North Cachar Hills was added to include a milk marketing system that faces difficult access of hilly terrains. The study on milk agents was conducted at the selected urban/semi-urban centres and rural areas in the identified nine districts. The agents as defined in this study included : (i)
unorganized milk vendors, (ii) wholesale milk collectors, and (iii) small milk processors (e.g., for making sweets, chhena, dahi/curd, ghee, etc.). The overall sample size of 590 respondents was determined.

The study has revealed that most of the informal milk market agents in the state of Assam are small traders and derive substantial portion of their household income from it. The scale of their business continues to be low, though the returns from the milk marketing seem to be comparable with or higher than the prevailing wages for an unskilled worker. Thus, milk marketing (fresh or processed) provides more lucrative returns. Majority of the milk marketing agents established their business themselves. The net returns from milk processing and value-addition were significantly higher than fresh milk marketing. However, the value-addition to milk being capital intensive is often beyond the reach of the resource poor small milk market agents indicating the need for increasing access to formal micro or small-scale credit through appropriate policy formulation of the financial institutions. In raw milk marketing, small traders are more efficient, while processing and value-addition favour bigger units. The traditional milk and milk products marketing agents in the state of Assam being the key link between local milk producers and consumers, dairy development policies should take into cognizance the needs of small-scale traditional milk marketing agents. With increasing awareness among consumers regarding quality and safety of milk and its products, efforts should be made to evolve some sort of
licensing, regularization and legal control to link traditional milk market agents with formal market agents without disturbing their enterprise in the state. It would help to maintain the quality and safety of milk and milk products.

Vijay Gorakh Patil\(^{59}\) (2010) had studied the production cost of milk at the farmer level in Shirpur Tehsil of Dhule District of Maharashtra state (India). The investingator had selected fifty dairy farmers from eight villages from Shirpur Tehsil, District Dhule. The questions related to fixed and variable cost were asked. The object of the study is to estimate the cost of milk production. The major finding of the study follows that the Cost of milk production was 9.10 per litre in the study area. The total cost of milk production per farm was Rs.113.87 in which the variable cost was 83.76 per cent (Rs.95.38) and remaining 16.24 per cent (Rs.18.49) was fixed cost. The variable cost was the main component of the cost of production. In variable cost, the cost of feed stuff and the cost of Labour are the major items. Therefore, effort should be made to ensure that farmers share some of their land in the cultivation of the fodder and proper management of labour should be the focus.

Vijay Gorakh Patil’s\(^{60}\) (2010) study on the 50 dairy farmers from eight villages of Shirpur Tehsil of Dhule District of Maharashtra (India) was undertaken to estimate the cost of production of milk in the area of study. The total cost of milk production per cow/buffalo was Rs.113.87 in which the variable cost was 83.76 per cent (Rs.95.38)
and remaining Rs.16.24 per cent (Rs.18.49) was fixed cost. In variable cost, the cost of feed stuff was 73.39 per cent (Rs.70). Labour cost was 15.73 per cent (Rs.15.00), the cost of medical treatment was 2.62 per cent (Rs.2.50) and interest on working capital was 8.26 per cent (7.88). Finally, it was found that the cost of milk was Rs.9.10 per litre in the study area. The variable cost was the main component of the cost of production. In variable costs, the cost of feed stuff and the cost of labour are the main components in the study area. Therefore, efforts should be made to pursue the farmers spare some of their land in the cultivation of the fodder and proper management of labour.

According to Shiv Raj Singh and K.K. Datta (2010), Indian dairy sector has shown tremendous growth in terms of milk production, from 17 million tones (1995-51) to 112 million tones (2009-10). This transition from deficiency to sufficiency has been achieved by a series of policy interventions by the government. It has been found that in the first phase of ‘Operation Flood’, growth rate of value-added products was 0.93 per cent per annum, but in the third phase, it became 9.10 per cent per annum. Milk processing in India is around 35 per cent, of which the organized dairy industry accounts for only 13 per cent of the milk produced, the remaining 22 per cent is processed in the unorganized sector. To explore the diversity and market exploration for enhancing the value in milk, the study has identified the untapped demand of different dairy and dairy products in ethnically diversified rural urban groups. This study has
highlighted certain dairy development policies to encourage growth of the dairy sector. While value addition in milk is unavoidable if one has to enhance sector profitability, the same does not seem feasible unless the organized sector improves its penetration. Because, it is the involvement of the organized sector that will drive the growth by resorting to value addition in basic product and harnessing the consumer market. The mechanics of the organized sector penetration could be agency-specific as also area-specific.

Anjani Kumar’s\textsuperscript{62} (2010) study has addressed the issues associated with the alternative milk market chains and their implications on dairy farmers and traders. It has been conducted in Bihar, where modern milk market chains especially the milk cooperatives have grown significantly. The study has shown that inspite of growing presence of modern milk supply chains, the traditional milk supply chain is still dominant. The empirical evidence does not appear to support the perceptions of exploitative nature of the traditional milk market agents. Traditional milk processing seems to offer good opportunities for the small and resource-poor milk producers and traders to enhance their income. The traditional milk sector should be addressed in a constructive manner and the policies should be evolved which would allow informal players improve their performance including quality control and their integration with the emerging modern milk supply chains.
Feroze, S.M. and A.K. Cauhan (2010) study assessed the performance of dairy SHGs in Haryana. The SHG members have saved satisfactory amount of money, though not cent per cent, in relation to planned savings. Internal loans are reported to be well distributed among the SHGs members. The SHGs have received external loans which are in tune with NABARD guidelines. Repayment performances of the SHGs are quite impressive for both internal as well as external loans. It is suggested that banks can follow the group lending mechanism to channelise the priority sector loans and also can easily target the poor sections of the society. Each SHG has financed more than a couple of income generating activities. On the basis of the overall composite performance index, it can be said that maximum proportion of the total SHGs have had average performance. Arrangement of skill training facility for the group members and marketing of the produce of the groups will keep the SHG members interested in the economic activity and improve the overall performance of the groups.

Babu, D and N.K. Verma (2010) study has analysed the value chains of milk and milk products in the co-operative and private dairy plants in the Salem district of Tamil Nadu based on the data collected from one co-operative plant, one private plant, five milk transportation routes, ten co-operative societies, ten private milk collection centres and six chilling centres for the year 2007-08. The overall average procurement cost per litre of milk has been found higher for the co-
operative dairy plant than the private plant due to increased cost on milk transportation, chilling and reception. The co-operative plant has been revealed more efficient in the manufacture of toned milk, standardized milk, full cream milk and ghee whereas the private plant has an edge over co-operative dairy plant in the manufacture of butter and SMP (skimmed milk powder). The marketing cost of toned milk, standardized milk, full cream milk and SMP has been found lower for private dairy plant and of butter and ghee for the co-operative dairy plant. The products which could earn a higher value after passing through the value chain are milk peda, khoa, khoa and SMP in the co-operative plant; and ice cream, Mysorepak and ghee in the private plant. The marketing margins and marketing efficiency have been found higher in toned milk, standardized milk and butter for the private plant and in full cream milk, ghee and SMP for the cooperative plant.

Tak A.V. and Tak V.B.\textsuperscript{65} (2010) highlighted the challenge of doubling milk production in India. Apart from milk production, the reforms in Dairy industry are explained along with priorities for future research.

Nirmala Buch\textsuperscript{66} (2010) explains the activities of Mahila Chetna Manch and Milk production in Madhya Pradesh. Mahila Chetna Manch (MCM) is a not-for-profit society which is actively focused on gender issues. It was set up in 1984 in Bhopal, and includes research, education, training, support services as well as livelihood
promotion in its activities. It runs hostels for working women and girl students, schools, and organizes training for ICDS project workers. The services address lower income families and are run on no profit, no loss, fee paying basis. MCM had mobilized rural women’s groups some years ago under the (GOI – Work Bank – IFAD assisted) ‘Swashakti’ programme for women’s empowerment in selected villages in four districts of Madhya Pradesh. These were Chhatarpur and Tikamgarh in Bundelkhand region and Betual and Hoshangabad in relatively better endowed southern Madhya Pradesh. To raise revenues MCM receives a small fee of 60 paise per litre of milk for these services from the Milk union. Milk of 2051 members of 34 milk societies is being collected and supplied at present. From the beginning of the project, the producers have received milk price totalling Rs.7.86 crores in this area. MCM has provided all the services so far, collected milk and supplied to the Bhopal Cooperative Union for which the producers have received Rs.2.40 crore.

Dadhich, C.L.\(^67\) (2010) study focuses on the Governance in Indian Dairy Cooperatives. The primary objective of this study is to assess the level of governance in dairy cooperative sector vis-à-vis other cooperative sectors. The paper is based on the latest comprehensive data published by NABARD and National Cooperative Union of India for the year 2001-02. This study discusses the place of dairy cooperatives in cooperative network, major stake holders and the level of governance. The analysis brings to the fore that quality of
governance in dairy cooperatives was better as compared to other segments in cooperative sector. The regular flow of income through milk proceeds has made cooperative dairy system distinct one and most relevant of farmer’s economy. Needless to say that the support and guidance extended by NDDB in establishing good governing practices has also significantly contributed to its higher level of governance. The variation in state-wise level of governance was due to members apathy in the waking of dairy cooperatives on the one hand and vested interests operating through the state interference on the other.

Feroze, S.M. and A.K. Chauhan (2010) study assessed the performance of dairy SHGs in Haryana. The SHG members have saved satisfactory amount of money, though not cent per cent, in relation to planned savings. Internal loans are reported to be well distributed among the SHGs members. The SHGs have received external loans which are in tune with NABARD guidelines. Repayment performances of the SHGs are quite impressive for both internal as well as external loans. It is suggested that banks can follow the group lending mechanism to channelise the priority sector loans and also can easily target the poor section of the society. Each SHG has financed more than a couple of income generating activities. On the basis of the overall composite performance index, it can be said that maximum proportion of the total SHGs have had average performance. Arrangement of skill training facility for the group
members and marketing of the produce of the groups will keep the SHG members interested in the economic activity and improve the overall performance of the groups.

Ganga Devi and D.K. Jain (2011) study was carried out in Jaipur district of Rajasthan during 2007-2008. The detailed information required for the study was collected from the selected households from Chomu and Amer tehsils. A complete enumeration of all the members of selected twenty SHGs was carried out and those members who were predominantly involved in dairying, i.e., 84 dairy members, constituted the sample for the present study. A matching sample of 84 non-SHG members involved in dairy activities was randomly taken from the selected clusters of villages. The primary data was collected from sample households on various parameters through a well-structured and pre-tested questionnaire. The study concluded that the per day average net cost of maintaining a buffalo, crossbred cow and local cow was relatively higher in case of SHG member households as compared to non-SHG member households. This was due to the fact that SHG member milk producers adopted better feeding and management practices to achieve higher levels of milk yield. The overall average net income per day in the case of buffaloes and crossbred cows was higher in SHG member households as compared to non-SHG member households. In the case of local cows the net income earned per milch animal per day was comparatively higher in non-SHG member households as compared to
SHG member households, due to higher net maintenance cost incurred by member households. Chow test concluded that production functions of milk differed significantly between SHG member and non-SHG member households. The coefficient for the constant dummy was also found to be positive and significant in the milk production functions, which indicated positive impact of finance through SHGs on returns from dairy units.
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