2.1.0 STATEMENT OF PROBLEM

The dairy industry plays a crucial role in national economy. But there are many hurdles also in the development of dairy industry such as sudden closure of cooperative units, high cost of imported equipments and machinery needed for cooperative dairying, fast changing technology, inadequate and traditional means of transport, under utilization of installed capacity, lack of effective legislative measures to regulate the milk market, lack of proper standardization and gradation of dairy products and poor quality of products and particularly in the case of cooperative dairy industries (Milk Unit) the inefficient management.

The problems mentioned above have seriously affected the production, sales and profit of the industry, which have a direct bearing on the financial health of dairy industry. It is very distressing to observe that some units within the industry performed well while others miserably failed.

The present study, therefore, is intended to probe into the organizational structure, personnel management and financial position, i.e. strength and weakness of the milk industry in the state of Haryana. Obviously, it is worthwhile to examine how this cooperative dairy industry is functioning and being managed in the state. It is against this background that the present study entitled. “A study of the working and organization of co-operative dairy industry in Haryana” has been undertaken.

2.2.0 REVIEW OF LITERATURE

The survey of literature plays an important role in establishing the backdrop for research work in social sciences. It is felt that justification of the present study can be sought by reviewing the available literature on the subject. Therefore, attempts have been made to review the available literature on the subject to find out the research gaps. A brief review of these studies is given below:

Tyagi (1975) in his study “Factors influencing the adoption of dairy innovations by farmers of Intensive Cattle Development Project (ICDP), Karnal in Haryana” reported that the adoption of breeding, disease control and management
practices were influenced by the herd size, knowledge, family education, farm size, sale of milk and occupation of the farmers.  

Rath (1977) investigated into improved dairy practices viz., breeding, disease prevention, cattle management and marketing in the village of Cuttak (Orissa). He found that dairy farmers, who had higher knowledge of breeding practices, had more cross-bred cattle. He also reported that farmers did not adopt artificial insemination due to the reason that cross-bred male calves would be useless for working purposes.  

Sharma (1979) made a survey in villages and Cattle fairs of Hisar and Rohtak Districts in Haryana. He observed that the village animals grow at a much slower rate due to underfeeding of growing stock below 2 years of age. He also found that the farmers took progressively great interest in heifer feeding as she got mature.  

Singh, Gangwar and Chakravasty (1979) studied the seasonal variations in cost of milk production in case of milk animals in Haryana and reported that the cost of milk production from cows was the lowest in summers and the highest in winters. In case of buffaloes, it was the highest in summers and the lowest in rainy season.  

Huria and Achaya (1980) stated that expansion of dairying was limited to the agricultural, economic, technological and social constraints. They found that the limit to the degree of dairy development depends on the low cost of animal feeding and the animal feeding system should be so designed that animals compete minimally with man for foods that both can consume. They also underlined that the present western model of dairy, based on too much concentrates as it is expected for cross-bred cows, is not suitable in its entirety for developing countries.  

Dahiya (1982) investigated, while studying comparison of specialized dairy farming, mixed farming and arable farming at Haryana Agricultural University, Hisar,

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that specialized dairy farming when compared to mixed and arable farming provided significantly higher milk returns.  

**Serka (1984)** while studying the impact of operation flood I and II and covering dairy farmers whose holding were less than 5 acres, more than 5 acres and landless persons indicated that most of milk procured, was through small land-holders and land less labourers. He favoured milk cooperatives as they significantly contributed towards the alleviation of poverty among rural milk producers.  

**Kaur and Sharma (1985)** investigated the role of rural women in Animal Husbandry in Haryana and found that in majority of the cases 66.10 percent females alone were responsible for care of animals. While assessing the contribution of women in the case of animals in different management practices, it was reported that the animal care was more or less a female domain.  

**Singh (1986)** explored some important implications of the operation flood II Programme. He also drew almost similar conclusions to Shanti George by explaining that operation Flood II did not seem to be a safe device to save the peasantry. In his attempt, he suggested to change the present policy and approach adopted in India under five year plans. He indicated that the magnitude of shortages of live-stock feeds and fodder would increase with the increase in the number of cross-bred Milch-Cattle. This would also adversely affect the genetic potential of cross-bred Cattle and hit hardest the small and marginal farmers and landless Cattle keepers. Hence, mere introduction of cross-breed animals would not increase milk production in the country.  

**Ratnam (1986)** while examining demand and supply of milk products and their nutritional aspects, observed that land-linked dairying at local levels, would ensure proper dairy development if it was accompanied by latest technology (Cross-breeding), better marketing facilities and adequate transport facilities. In his study, he

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also analysed the role of all India and State-based undertakings which emerged after independence and the backsliding of the old tradition of Goushalas.32

Bedi (1987) studied the impact of the total dairy development programme in the Hoshiarpur and Sangrur Districts in Punjab both at the level of beneficiaries and at the programme level. His observation was that the dairy practices, including maintenance of milch animals, their holding pattern, milk yield per animal, etc. remained almost constant during the pre-loan and post-loan periods. He also felt that the assumptions guiding the programme and the expectations of the respondents were also found to be mutually incompatible and thus failed to make any break-through in the prevailing dairy situation in the area. He concluded that dairy development programme with sufficient planning and control and better marketing oriented efforts might achieve the established objectives or reducing income disparities and desired profitability.33

Mascarenhas (1988) worked on dairy co-operatives in Karnataka. He favoured the cross-breeding or embryo technology for enhancing milk production. In his opinion operation flood programme made a considerable impact on changing the attitudes of the people, moving towards commercialization, enlarging employment and contributing village amenities.34

Chander (1990) suggested in his study of dairy development of drought prone district of Chittor in Andhra Pradesh, that in order to increase per animal net returns and per farm human labour employment, a provision of availability of fodder and better marketing system for milk and milk products would have to be worked out.35

Dutt (1990) suggested cross-breeding as a policy to overcome low productivity of our Milch-Cattle. He also favoured operation of flood II programme for effective utilization of animal wealth and man power. Education, size of family, size of land holding, number of Milch animals and management practices have favourably affected the daily milk production but marketed surplus of milk was

greater in the case of small-holdings. A study on seasonal variations in the cost of milk production in Haryana revealed that the cost of milk production from cows was the lowest in summers and the highest in winters. In case of buffaloes it was the highest in summer and lowest in rainy season. Dairy development depended on the low cost of animal feeding. High cost of animal feeding based on large amount concentrates was not suitable for developing countries as it competed with man for food. Irrigated area and buffaloes had clear income advantages over un-irrigated areas and cows respectively. In some studies cross-breeding policy was also suggested to overcome low productivity of Milch-Cattle.36

Rao (1991) in his study of socio-economic analysis of milk production observed that socio-economic factors, education, size of land holding and herd size etc were significantly responsible in enhancing milk production.37

Parthasarathy (1991) in his study of White Revolution, Dairy Cooperatives and Weaker sections found a significant increase of milk production, though the claim of White Revolution was exaggerated. He also observed that Milch-Cattle were more equitably distributed than cropland and supplementary income from milk tended to reduce the overall in-equalities. In his observation landless labourers were not found to have benefited from dairy development and the policy of integration of marketing, input and veterinary services was well conceived with some adjustment to agro-economic situations. He also reported adoption of the cross-bred varieties to the local conditions and advocated its further encouragement.38

Arora (1992) studied the same economic and managerial problems of Dairy Industry in the State of Haryana, as such only District Coop Milk producers unions have been included within the scope of the research. The basic objective of the study was to analyze the organizational and managerial structure of Dairy Co-operatives in Haryana. He analyzed that most of the unions are victims of administrative a path and red tapsim which has affected the working of milk unions. Trade union activities among the employees were also equally responsible for the poor performance of these

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unions. He also observed that the economic viability of the milk society mainly depends on the quantity of milk procured from the milk producers. The performance of the Dairy Co-operatives in collection of milk had not been satisfactory. He also found that the problems of selecting, operating and maintaining personnel for milk plant work has increased in proportion to the improvement in dairy technology. No uniform policy was followed in recruiting the employees at milk union level.  

Shah (1992) while analyzing Dairy Development as means of improving the nutritional status of rural poor, found that the operation flood project upgraded the overall standard of living of the poor milk producers. But simultaneously the role of the status as well as voluntary agencies in raising this must be recognized. He also reported that as the problems of poverty and nutrition being deeply inter-related and very complex from the angles of the socio-economic inequality prevailing in rural India, a replication of Anand Model would perhaps be regarded as complete without the replication of other rural development projects viz. nutrition, education, food fortification, price intervention through public distribution systems, integrated family planning and Balwadis etc.  

Singh and Joshi (2008) reported the economic analysis of dairy farming has been reported for marginal and small farmers in Punjab for the year 2003-04. It has been found that a majority of the farm households are not able to meet their requirements from their income from crops. Further dairy farming has emerged as a major allied enterprise for supplementing the income of marginal and small farmers in Punjab. Income from off-farm sources has been identified another important factor contributing significantly to the disposable income of these farm households. The study has suggested to further exploit the potential of off-farm sources towards

meeting the domestic expenditure. Also, the technical efficiency of crops and dairy farming should be improved to provide more income to farmers.\textsuperscript{41}

Islam, Goswami and Mazumdar (2008) have analysed Tehatta-II block of Nadia district in West Bengal. There were 17 blocks in the Nadia district of which Tehatta-II block was selected purposely. The block consisted of 7 gram panchayats and 2 gram panchayats namely Palsunda-I and Barnia were selected randomly. Fifty dairy farmers were selected from each gram panchayats based on judgement sampling. The study area was more or less homogenous with respect to animal husbandry practices, socio-cultural conditions, facilities for service and critical inputs. Most of the dairy farmers in study areas were unorganized in milk production.

Relevant information from the individual milk producers (dairy farmers) had been collected through personal interrogation method with the help of a structured interview schedule prepared for the study. The study revealed that crossbred cows were more economical and gave higher yield than the indigenous cows and inclusion of a few crossbred cows can increase the income of a dairy entrepreneur and provide gainful and round the year employment.

Family labour work was carried out in the mill pocket areas of eight districts of Marathwada region. About 59 percent of the dairy farmers belonged to general (unreserved) category, 25 percent were backward class and only 8 percent each of SC and ST. The landless dairymen equally contributed with dairymen having (large) land; 13 landless dairymen reported comparable lactation yield as the number of milch animals increased, the herd lactation performance decreased. The animals maintained by joint family were not properly cared for while they were cared for properly by single family.\textsuperscript{42}

Patil (2008) pointed out the paper Co-operative Dairy Movement and Operation Flood in Maharashtra: an overview, the operation flood have increased employment, income and consumption of milk of rural people in Maharashtra state. Thus the operation flood has very deep and strong positive impact on Indian dairying in particular and sector in general. Also studied about the operation flood


programmes, the operation floods have increased employment, income and consumption of milk of rural people in Maharashtra state. Thus the operation flood has very deep and strong positive impact on Indian dairying in particular and on Indian agriculture sector in general.\textsuperscript{43}

\textbf{Sintayehu Yigrem, et al. (2008)} studied about two hundred forty dairy producers. Both rural and urban producers in the four major towns representing the Shashemene–Dilla area in southern Ethiopia, were selected using a multi-stage sampling techniques, with the objective of characterizing dairy production, processing/handling, marketing systems as well as to prioritize constraints and opportunities for dairy development in the area. To characterize dairy marketing systems in the study area, a Rapid Market Appraisal (RMA) technique was employed. Dairy marketing systems were studied with the help of topical guidelines. Dairy producers were interviewed using a pre-tested and structured formal questionnaire. Two major dairy production systems, namely the urban and mixed crop–livestock.\textsuperscript{44}

\textbf{Krishnan, Nigam, and Kumar (2008)} in their opinion growing human population, rising per capita income and increasing urbanization are fuelling rapid growth in the demand for food and animal origin in developing countries. India possesses the largest livestock population in the world. Contrary to the large population of livestock in India productivity of Indian livestock is lower compared to many developing countries.\textsuperscript{45}

\textbf{Waghmare P.R. and Hedgire D.N. (2007)} opined that Milk productions in India during 1950-51 were 17 million tonnes which has reached 78 million tonnes in 1997-98. Presently India ranks first in the world in milk production. The Operation Flood Programme was instrumental in dairy development activities. These programmes are useful in upgrading the standard of living of farmers.\textsuperscript{46}

\textsuperscript{44} Sintayehu Yigrem, et al. (2008), “Dairy production, processing and marketing systems of Shashemene - Dilla area, South Ethiopia” – abstract of the project on Improving Productivity and Market Success (IPMS) of Ethiopian farmers project, International Livestock Research.
\textsuperscript{46} Waghmare P.R. and Hedgire D.N. Econometric analysis of integrated dairy development Programme in Parbhani District, \textit{Agricultural Situation in India}, Vol. 64, Issue 3, 2007, 97-101.
Hasan Cicek, et al. (2007) examined to determine the technical and socio-economic factors that may affect the cost in dairy enterprises. In this context, the annual production records (2005-2006) in 77 dairy enterprises running in Western Turkey were examined. Data were analyzed by using multiple regression models. Results showed that the parameters such as education of the producers, scale of the enterprise, feed consumption, feed procuring and litter size had significant effect (P < 0.05) on the average milk costs. On the other hand, marketing, main occupation and age of the producer were found to be statistically insignificant (P > 0.05). In conclusion controlling the technical and socio-economic factors was found to have important effect on decreasing the cost of the production as well as increasing the profitability of the enterprise.  

Karmakar and Banerjee (2006) pointed out that growth in milk production is likely to continue at the present rate of 4.4% in the near future. Who is going to handle this incremental milk? We must bear in mind is both income and price. We must bear in mind both income & price elasticity account for approximately 15% of the total expenditure of food. Demand for milk, at current rate of income growth is estimated to grow at 7% per annum. Interestingly, demand for milk is expected to grow steadily over the next two decades as the low income rural and urban families who have higher expenditure elasticity would also increase their income due to new economic environment.

Dash, Sadangi and Pandey (2006) evaluated “Women Dairy Project - Balasore and Bharak districts of Orissa” sponsored by Ministry of Women and Child Development, Government of India in the year 2005. The Women dairy funded under STEP envisaged formation of women dairy co-operative societies and supporting the societies and members by way of creating marketing infrastructure, supplying physical inputs for dairy development and arranging training for office bearers and members. The project created a good impact on dairy sector as a whole and on cross section of beneficiaries. The project, thus, created a favorable environment for higher

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production of milk. During two years period the milk production increased by 81 percent with the average daily production per pourer increasing from 2.6 litres to 4.7 litres. However, the impact was differential on different categories of farmers with big farmers gaining up to the maximum. The project also introduced several technological changes such as artificial insemination, fodder cultivation, urea treated straw, improved health care and dairy management in the dairy sector, the adoption of which is likely to pick up in coming days. Similarly, the project contributed to the capacity building of members in terms of awareness generation, gain in knowledge, skill development through orientation and training albeit to a varying degree. The project has created a motivating and enabling environment for the members to move ahead and for women leadership to grow.49

**Ramakrishnappa and Jagannatha (2006)** opined that the dairy enterprise is an established sector in rural India and is playing a vital role in generating additional income and employment. In Karnataka, dairy development is a positive and significant as state contributes towards milk production, marketing, and processing of various dairy products in India. The microfinance programmes extended in dairy sector are helpful to take up dairy as main occupation among economically backward communities in the state. In this paper, an attempt was made to analyze the different aspects of microfinance scheme (New Swarnima) implemented by KBCDC. The implementation of New Swarnima Scheme, one of the most popular microfinance schemes in the state to promote dairy among backward communities, was assessed at micro level by selecting 18 beneficiaries belonging to landless labourers, marginal and small farmers in Kolar district in Karnataka state. The study found that the microfinance scheme has positive impact on income and employment generation, and has improved the natural resource management options.50

**Somda, Kamuanga and Tollens (2005)** suggested that the domestic milk production has been, for a long time, hindered by many factors including lack of interest from decision makers, distorted economic policy and biotechnical

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constraints. For the last 20 years, many developing countries have been attempting to develop the domestic milk production sector. However, research on the basic realities and the viability status of enterprises within this sector remain largely unproved in many developing countries. This study focuses on the characteristic of smallholder milk producers in Gambia. Data were collected from 90 smallholder farm households to characterise milk producers and evaluate the profitability and viability status of this activity. Based on current typology of farms and gross margin analyses at farm level, the study identified two resource-based types of smallholder farms. The current milk production system is surely viable. Constraints to increased productivity include lack of improved technology at farm level and weak institutional support. Despite the low viability status, it is shown that milk production generates reliable incomes, which could be a departure for most farmers to intensify farming systems, particularly in areas where no loan schemes exist for purchasing agricultural inputs.  

Jeyachandra, Reddy and Ramakrishna (2004) studied and analysed the economics of milk production in three areas, viz., Chittoor district in Andhra Pradesh, Erode District in Tamil Nadu and Kolar district in Karnataka involving aspects related to existing cost structure of milk production, profitability of crossbred dairy cows in the three states under the changed socio economic political scenario and also suggest methods to improve the viability and profitability of these enterprises. The data were collected by survey method during the year 2003. Seventy five farmers were selected at each location giving due importance in the selection of all categories of households. The number of dairy cows studied were 108 in Chittoor, 178 in Erode and 84 in Kolar districts. The net cost of maintenance of a cross bred cow per day worked out to Rs.38.99, Rs.49.36 and Rs.48.88 in Andhra Pradesh, Tamil Nadu and Karnataka respectively. The cost per litre of milk worked out to Rs.5.48, Rs.7.20 and Rs.5.84 in the same order. Feed cost was the major component in gross cost which accounted for 63.88 per cent in Andhra Pradesh, 72.14 per cent in Tamil Nadu and 71.62 per cent in Karnataka. The net profitability varied from 43 per cent in Tamil Nadu, 70 per cent in Andhra Pradesh and 83 per cent in Karnataka. The variations

among the three studied locations are due to variation in breed, feeding pattern, maintenance of animals, etc. The study has further brought out the fact that higher fat content provides higher price as milk price is based on fat and solid-Net-Fat (SNF) content by dairies. Hence proper scientific breeding procedure is to be followed to improve fat content in the milk as well as milk production per animal. Besides, scientific breeding, feeding, treatment and veterinary care and management would not only increase milk production and fat content in addition to reduction in cost, but also incomes of farmers. Thus dairy farming is considered an instrument for socio economic change in rural areas.

Saxena (2002) in his view, Milk production in India is characterized by a large number of milch animals, a large number of milk producers, mixed farming and low productivity of milk per animal Most of the total milk production in the country comes from indigenous cows (27%), crossbred cows (15%) and buffaloes (54%). Goats and other animals contribute only a minor share (4%) to the total milk production. The population of crossbred cows and buffaloes is kept largely for milk production while the population of indigenous cows is maintained for producing both milk and drought animals. About 58 per cent of the total population of cattle and buffaloes in India in this study uses the LCA approach to estimate the environmental impact of milk production in terms of methane emissions. The study focuses only on bovine milk production as it accounts for about 96 per cent of the total milk production in India. The methane emissions in the study are estimated at the level of indigenous cows, crossbred cows and buffaloes instead of the usual two categories of cows and buffaloes. The analysis of methane emissions in terms of per kg of milk production has been extended to methane emissions per rupee worth of milk production, as the prices of cow and buffalo milk are very different due to the different fat content. The environmental impact has been assessed in two steps: (1) inventory analysis and (2) impact assessment. Under the first step, an inventory has been taken of raw materials and associated emissions. The impact of these raw materials and emissions has been assessed under the second step. The raw materials

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used by cattle and buffaloes are divided into two categories, namely (1) concentrates and (2) roughages. The roughages are sub-divided further into green fodder and dry fodder. The emissions of methane associated with bovine milk production take place mainly at three stages, namely (1) enteric fermentation, (2) manure management, and (3) use of dung as domestic fuel. The study has used IPCC guidelines and is based largely on the secondary data available from various sources of an average Indian. Milk contributed 66.8% of the total value of output from livestock (1998-99). In addition to milk and milk products for human consumption, cattle and buffaloes also provide animal power for agricultural operations and rural transport needs. The draught animal power, which is valued at Rs.4000-95000 million is not included in the total value of output from livestock. The 75 million draught animals (mostly cattle and buffaloes) contribute 20% of energy input into crop farming. Although there has been large reduction in contribution of draught (DAP) from 72% in 1961 to 23% in 1991 mainly due to mechanization, the requirement of DAP shall continue to be around 20% in years to come. Milk production in 1998-99 was estimated to be 74.7 million tonnes, which is less than 10% of world production. Around 54% of this total milk comes from buffaloes, 42% from cows and 4% from goats. Large increase in milk production has been due to increase in numbers and change in composition of cattle population mainly due to increase in number of crossbreds.\textsuperscript{53}

Hegde (2001) pointed out that there is very little breathing time for Indian farmers to face the challenge of importing milk and milk products under WTO. Our farmers are not prepared to solve them well on time. It is necessary to reduce the cost of milk production by increasing the productivity of our animals. We also need to reduce the cost of handling of milk and processing by reducing intermediary agencies and by adding value to the produce. The quality of the milk should be of international standard which can be improved through screening of the livestock against important diseases and maintaining clean surroundings in the dairy farm. Finally, the policy of producing low fat milk for general consumption while the high fat buffalo milk can be supplied to a selected category of customers interested in high butter fat. We need to

discuss with the farmers and understand their problems and solve them at the earliest. Surely, we also need to strengthen our farmers associations to acquire new technologies understand the milk marketing scenario at the international level and find suitable solutions. We hope the task is within our reach for solving.\textsuperscript{54}

\textbf{Rawal and Vikas (2001)} analysed that the comparison of caste, education and land holding of MS farmers with NMS farmers points to a larger proportion of households belonging to the backward caste, being less educated and holding lower size of land are not able to participate in dairying. A recent study of two dairy cooperatives in Gujarat argued that inequality in land ownership, caste; illiteracy and undemocratic functioning of co-operatives are the barriers to entry. Illiteracy might not be a factor in Kerala but land ownership could be one, as among the lower size-class of land owners smaller proportion seem to be keeping cattle.\textsuperscript{55}

\textbf{Gautam Kakaty and Moromi Gogoi (2001)} animal husbandry plays a pivotal role in the agrarian economy of India. It is closely interlinked with the socio-economic matrix of rural society. The development of livestock sector has been receiving significant priority in India in the last two to three decades Dairy sector contributes significantly in generating employment opportunities and supplementing the income of small and marginal farmers providing them by food security.\textsuperscript{56}

\textbf{Narayana (2001)} opined that the work status of the adult population has no significant difference between MS farmers and NMS farmers could be observed. Women, however, devoted considerable amount of time for dairying, irrespective of whether they reported as working or not working and giving the reason as housewife. Obviously, the categories of work status and employment often used are not very useful in capturing the work input of women in dairying. Time disposal studies do help to bring this aspect of work and show that women’s role in cattle keeping is great. The initiatives undertaken such as Malabar Rural Development Foundation for

improving the quality of dairy farmers are welcome as they go beyond the landless as their participation in dairying is low.\textsuperscript{57}

\textbf{Bandyopadhyay (1996)} pointed out that maximum people of thickly populated India live in villages. Majority of them are involved in agriculture in India as the old method of cultivation is still vogue here. Rearing of cattle animal is also an additional source of income of the villagers in our country. We get from our ancient history that the domestication of the cow and the buffalo dates back to nearly 4000 years. Scriptures of India refer to the wealth through the word Godhan’ Maximum properties of cows and buffaloes of the world are seen in India. This amount is too inadequate to meet the country’s demand. The supply of milk in some parts of India is higher than the local demand. On the other hand, supply of milk in the rest of the country as well as urban areas is much lower than the demand. In 1965, National Dairy Development Board (N.D.D.B) was set up with the object of meeting the increasing demand of milk specially in urban areas as well as developing the rural economy through the enhancement of the milk production in the country.\textsuperscript{58}

\textbf{Sharma and Vanjani (1993)} are of the opinion that following the proclaimed success of cooperative dairy schemes in other parts of India (Operation Flood based on the Amul model), the Rajasthan government is attempting a similar scheme. A key theme of the project is to bring women into the main stream of dairy development in order to improve their economic, nutritional, and social status. For this purpose a special program was initiated to train poor rural women in ‘dairy camps’ on how to care for their milk animals. Successful completion of such 'camp' training then qualifies the woman for a loan to buy an animal in her name. It is hoped that a part of the milk obtained will go to the village dairy cooperative. The major aims of this program are to: remove milk animals from the cities; encourage production of more milk for the cooperative dairies; encourage modern techniques of animal care; put control of the income from milk-selling in the hands of the women

\textsuperscript{57} Narayana, Dairying in Malabar: A Venture of the Landowning based on Women’s work?, \textit{Indian journal of Agricultural Economics}, Vol. 57, No. 4, October - December, , 2001, 712.

\textsuperscript{58} Manob Kanti Bandyopadhyay, Dairy Co-operation and Rural Development (with special reference to comparative study between the Kaira District Co-operative Milk producers’ Union limited and the Himalayan Co-operative Milk producers’ Union Limited), \textit{Finance India}, Vol. 10, No. 2, June, 1996, 406-411.
who care for the animals by permitting them to own the animals and hence contribute
to their 'independence' and 'development;' and to encourage self-sufficiency for the
weaker sections by providing loans to the poor. Data for this paper were collected
during fieldwork in a village in Alwar District, Rajasthan and specifically from
observation and participation in the two-week dairy 'camp' there. Eighteen women
were selected on poverty criteria to participate in the program. The general situation
of these women is analyzed within the context of a critical discussion of the dairy
movement in India, in general, and the intended effects on the lives of the village
women, in particular, with special attention to the impact on their work load,
nutritional intake and, ultimately, overall health. Concluding remarks are addressed to
the broad issues of government development programs and why more of the same
type of development strategies persist in the face of often-repeated failures.  

Shankari (1989) opined that the given the context of a prolonged drought, in
which the little income they derived from dairying went a long way in meeting their
survival needs, it is no wonder that the farmers of Chittoor district in Andhra Pradesh
who studied here had a positive attitude to the crossbreed programme. But while
the crossbreed cow is clearly a superior milk animal to the local breed and the local
breed cow is fast becoming redundant for all categories of farmers, the fact that the
bullocks cannot be dispensed with drives at least a few of the farmers to maintain
bullocks. The losses from the bullocks are made up by the gains from the crossbreed
cows. The landless, however, tend to maintain local breed cows even if it means far
lower incomes since the investments and risks involved are smaller.  

Moran (1987) viewed that cattle and buffalo play an important role in the
agriculture of South East Asia, providing both milk and meat and also traction for
ploughing and transport. The native breeds vary considerably in their characteristics,
not only in their inherent qualities but in their response to varying systems of
management, some very primitive. Improvement is clearly possible by cross-breeding,

59 Miriam Sharma and Urmila Vanjani  “When more means less: Assessing the impact of dairy
development' on the lives and health of women in rural Rajasthan (India), Social Science and
60 Uma Shankari, What is Happening to Cows and Bulls of Sundarapalle? Economic and Political
but it appears that this is most likely to be achieved within existing native breeds, rather than by introducing exotic ones developed to thrive under very circumstances.\textsuperscript{61}

Bohr (1962) opined that dairy farming, one of the most important economic activities in the rural mountain areas of Uttaranchal, is closely intertwined with farming systems. Rural communities fondly relish dairy products. Dairying again is the main purpose of animal husbandry in mountain areas. Apart from ensuring nutrient supplies to the families owning dairy farms, dairying also offers promising Employment opportunities and handsome economic returns. In Uttaranchal mountains, dairying is especially a promising economic activity for smallholders who constitute the majority of farming communities in the region. Smallholder dairy farming is increasingly gaining importance as a source of family income in mountain areas for quite some. However, contributions of smallholder dairy farming accrued to the community and farming system are still not well recognized. India emerging as the top milk producer in the world is largely due to smallholder, rather than intensive, dairy farming linked with the marketing system.\textsuperscript{62}

Saravanakumar and Jain (2009) viewed that “The two-axes pricing policy is followed normally in the dairy business centres of Tamil Nadu. Though it is scientifically rational, it ignores the input prices, technology and government policies. For sustaining the growth momentum and achieving an annual average growth of 7-8 per cent in the next five years and considering that dairying is practiced as a component of mixed farming systems, it becomes imperative to take into account the interrelationship among the enterprises and general economic factors while fixing the milk price. In this study, development of a price determination model has been reported. It is based on the cost of production and takes into account price and non-price factors, viz. technology, and projected different price scenarios of milk for the coming years. The study undertaken in Tamil Nadu state is based on primary data collected for the year 2002-03 and has used normalized restricted quadratic profit function analysis and price determination models. It has been found that to maintain

\textsuperscript{62} Babita Bohr, Milk production, marketing and consumption pattern at peri urban dairy farms in the mountains: a case from lohaghat in Uttaranchal, \textit{ENVIS Bulletin}, Vol. 12(1).
constant returns to the production cost of milk, the milk price would need an upward adjustment of 9.97 per cent, whereas to provide constant net monetary income, the milk price would need an upward adjustment by 10.30 per cent for buffalo milk. Considering 2002-03 as the base year, the estimated price for milk per litre is expected to be Rs.23.64 at constant monetary income and Rs.23.15 at constant return to production cost in the year 2009-10. The results of the paper are illustrative of the utility approach in generating consistent price sets for milk in response to alternative policy interventions.63

**Haese M.D., et al. (2009)** Analysed the efficiency on dairy farms in Reunion Island, a French overseas district located in the Indian Ocean. On this island, dairy farming is promoted with financial and technical support from the European Union, with the French and local governments aiming at reducing dependency on imports of milk powder and dairy products and creating employment. A critical factor for increasing the local milk production is the limited availability of arable land because of the small size and the volcanic nature of the island. In this paper, we study the efficiency levels of dairy production of 34 farms by using a data envelopment analysis approach. The average technical efficiency score of farms, assuming constant returns to scale, was 0.927, with 19 out of 34 farms not being efficient. The technical efficiency with variable returns to scale specification was 0.951. The efficiency with which farmers used their land (subvector efficiencies) was estimated in the second model. The average subvector efficiencies calculated with constant returns to scale and variable returns to scale models were lower than the technical efficiencies. The farmers on the efficiency frontier had a relatively higher milk production, milk production per cow, and land surface more than those who were less efficient. A policy promoting better use of the land on inefficient farms should increase the milk production-to-land ratio. Possible on-farm strategies improved feeding systems, farms having their own heifer breeding, and improved genetics.64

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Mathialagan, Chandrasekaran. D.C. and Manivannan. A. (2009) in their study conducted with the objective of training the farmers on feeding technologies for improving the SNF content of milk in milch animals and to assess its impact at the field level. About 159 women dairy farmers cum self help group members belonging to ten different villages of Namakkal district were selected for the study. A benchmark survey was conducted for all the women dairy farmers on cost effective feeding practices for dairy cattle, feeding of chopped fodder on the animals and supplementing diet with minerals. The results indicate that 46.37% of cow milk samples had less than 8.0% of SNF content. When the SNF content falls below 8.0% the payment for the milk will be calculated based on the fat content of the milk as per the price policy of milk co-operative societies. In such cases, the farmers would get a lower price of Rs.6.50/- per litre instead of Rs.8.75 / litre of milk.65

Rhone, Ward, De Vries and Elzo (2008) analysed and investigated determinates of how milk pricing system, farm location, farm size, and month and year affected farm milk price (FMP), farm milk revenue (FMR) and loss in FMR of dairy farms in the Central region of Thailand. A total of 58,575 milk price and 813,636 milk yield records from 1034 farms were collected from November of 2004 to June of 2006. Farms were located in the districts of Muaklek, Pak Chong, Wang Muang, and Kaeng Khoi. A fixed linear model was used to analyze milk price of farms. Two pricing systems were defined as 1 = base price plus additions / deductions for milk fat percentage, solids-non-fat, and bacterial score, and 2 = same as 1 plus bulk tank somatic cell count (BTSCC). Farm size (small, medium, and large) was based on the number of cows milked per day. Results showed that FMP were lower (P < 0.05) in pricing system 1 than in pricing system 2. Most small farms had higher (P < 0.05) milk prices than medium and large farms across in both pricing systems. Large farms lost more milk revenue due to deductions from bacterial score and BTSCC than small and medium farms.66

Doyon, Criner and Bragg (2008) viewed and opined that the New England dairy farmers are under intense price pressure resulting from important growth in milk production from lower cost of production in Southwest states as well as by retailers’ market power. Agricultural officials and legislative bodies in New England and in other Northeast US states are aware of these pressures and have been reacting with emergency dairy farm aid, following a very low 2006 milk price, and with state legislations in an attempt to address perceived excess retailing margins for fluid milk. In this paper, we suggest that a sigmoid demand relationship exists for fluid milk. This demand relationship would explain fluid milk asymmetric price transmission, high-low pricing, and the creation of a large retailing margin (chain surplus) often observed for fluid milk. It is also argued that a sigmoid demand relationship offers an opportunity for state legislators to help Northeast dairy farmers capturing a larger share of the dollar of the consumers through various policy options. Therefore, 5 milk market channel regulatory mechanisms (status quo, price gouging, supply control, fair share policy, and chain surplus return) are discussed and compared. The supply control mechanism was found the most effective at redistributing the chain surplus, associated with the sigmoid demand relationship for fluid milk, to dairy farmers. However, this option is unlikely to be politically acceptable in the United States. Second-best options for increasing dairy farmers’ share of the consumers’ dollar are the fair price policy and the chain surplus return. The former mechanism would distribute the chain surplus between retailers, processors, and farmers, whereas the latter would distribute it between consumers, retailers, and farmers. Remaining mechanisms would either transfer the chain surplus to retailers (status quo) or to consumers (price gouging).

Kedija, Mohammed and Berhanu (2008) viewed that the Ethiopia holds the largest ruminant livestock population in Africa, productivity has remained low and its contribution to the national economy is limited compared to its potential. The overall milk production system in Ethiopia could be broadly classified as pastoral and agro pastoral, crop-livestock mixed and peri-urban and urban dairy production systems. Cattle, camel and goats are the main live stock species that supply milk.

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Total annual milk production from about 10 million milk animals is estimated at about 3.2 billion litres, which translates to 1.54 litres per cow per day (CSA, 2008). The bulk of this milk production (81.2%) comes from cattle, while small ruminants and camels contribute 12.5% and 6.3%, respectively (CSA, 2008). The lowland covers 60% of total land area and is home for 12.2% of the total human population. Ecologically it has arid (64%), semi-arid (21%) and sub-humid (15%) areas dominated by semi nomadic transhumance population whose economy is entirely dependent on livestock production (GETACHEW, 2003). Milk is the major source of food and income. Cattle dominate the population (55.4% of the TLU) followed by camels (15.3%), goats (13.7%) and sheep (6.4%), (CSA, 2008), and produce 27% of the total annual milk production (Getachew, 2003). Information is very scantily on the milk production and marketing system in the lowland areas in general. This study was therefore undertaken in the lowlands of Mieso district to (1) characterize the milk production and marketing system, (2) identify major constraints for the development of market-oriented dairy production, and (3) formulate recommendations for further development interventions.68

Saravanakumar and Jain (2008) conducted a study ‘Technical Efficiency of Dairy Farms in Tamil Nadu” which was carried out to evaluate dairy farm households in terms of efficiency of milk production using stochastic frontier production methods. The data for the study comprised of fixed investments on dairy farms, quantity and price of feeds and fodders fed to individual animals, labour utilization pattern, veterinary and miscellaneous expenses, quantity of milk produced and price realized etc. collected from 160 sample households across flush and lean season for the year 2002-03. The coefficients for the value of green fodder and concentrate were found to be statistically significant with a relatively higher magnitude implying their greater and significant role in crossbred cow milk production. The technical efficiency of crossbred cow farms ranged from 72.30 to 97.90 percent with an average of 82.10 percent. The study indicated that there existed a scope to

68 Kedija Hussen1, Mohammed Yousuf1 and Berhanu Gebremedhin, Cow and camel milk production and marketing in agro-pastoral and mixed crop-livestock systems in Ethiopia, Research Paper Presented at the Conference on International Research on Food Security, Natural Resource Management and Rural Development held at University of Hohenheim, on October 7-9, 2008.
increase milk production of an average farm to 16.32 percent for crossbred cows and 14.04 percent for buffaloes without incurring any extra expenditure on these farms.\textsuperscript{69}

Gupta (2007) viewed that the country’s milk production is estimated to have touched 100 million tonnes (mt) last year, which is higher than the estimated 92 mt for rice and 75 mt for wheat. In value terms, too, a kg of milk is worth more than what you and I pay for a kg of rice and wheat. But despite all this and the fact that India is today the world’s largest milk producer, the dairy industry is for some strange reason not considered ‘glamourous’. For policy makers, dairying is viewed as a ‘subsidiary’ activity. There, when milk is one product that generates cash income to farmers almost on a daily basis, unlike sugarcane or wheat. Besides being a source of liquidity and insurance against crop failure, milk is the only crop where the farmer realizes 60-70 per cent of consumer price - against 20 per cent or so in fruits and vegetables. Again, it is striking that there are no commodity futures in milk powder or ghee, whereas the daily turnover volumes in NCDEX and MCX of guarseed, mentha oil, jeera or pepper run to hundreds (even thousands) of crores! One reason for this ‘image problem’ suffered by milk has to do with the absence of proper data bases with authentic information on the sector. This is a gap that Dairy India 2007 (Sixth Edition) seeks to fill. A treasure trove of information, this 864-page publication offers the most comprehensive and up-to-date picture about the world’s numero uno dairying nation. An invaluable Databank-cum-Management Guide-cum-Directory, it contains over 120 in-depth articles, 260 statistical tables and charts and reference details of 7,000 organizations including dairy plants and farms, equipment and consumable manufacturers, cattle feed and veterinary pharmaceutical manufacturers, chemicals and food additives, project consultants, breeding and fodder seed farms, analytical and disease-diagnostic laboratories, cooperative institutions and government agencies. The articles cover a range of topics including trends in consumption and market size of milk and milk products, WTO challenges and export potential, management of dairy plants and farms, breeding, feeding and nutrition, health care, clean milk production, food safety and quality standards as well as techno-economic feasibility of small and large scale dairy plants and farms, cattle

feed units, and manufacture of cheese, ice-cream, etc. In addition, there is a special section devoted to technology innovations and organized production of indigenous milk products such as paneer, gulab-jamun, rasogolla and shrikhand - a potentially lucrative segment ignored so far by the industry in its obsession with butter, cheese and other ‘foreign’ products. Dairy India 2007 has estimated the size of India’s dairy sector in 2005 at Rs.27,340 crore (valued at consumer prices). The largest contributor to this is liquid milk (at Rs.82,835 crore), followed by ghee (Rs.22,980 crore), khoa/chhana/paneer (Rs.24,100 crore), milk powder (Rs.4,680 crore), table butter (Rs.770 crore), cheese/edible casein (Rs.975 crore) and other products such as ethnic sweets, ice-cream, etc (Rs.9,100 crore). Out of the total milk production of 94.5 mt, 77 per cent or 73.1 mt is sold as liquid milk, with the balance 23 per cent or 21.4 mt converted into products. Further, the organized industry handles only 18 per cent or 17 mt of milk, with 36 per cent (34.5 mt) being handled by private dudhias and unorganized players and 46 per cent (43 mt) being retained in rural areas. Within the 18 per cent organized sector share, private and cooperative/government dairies handle an equal 8.5 mt each. By 2011, Dairy India projects the value of the industry to more than double to Rs.520,780 crore, which includes Rs.159,600 crore from liquid milk, Rs.42,680 crore from ghee, Rs.50,500 crore from khoa / chhana / paneer, Rs.9,100 crore from milk powder, Rs.2,250 crore from table butter, Rs.6,150 crore from cheese/edible casein and Rs.25,050 crore from other products. Interestingly, out of the anticipated milk output of 120 mt, the share of liquid milk will rise to 81 per cent or 97.5 mt and only the rest 19 per cent (22.5 mt) would get converted into products. But the organized industry’s share of total milk handling will go up to 30 per cent (36 mt), while the small players will see their share dip to 22 per cent (26 mt). At the same time, higher rural incomes will marginally boost the share of milk retained in rural areas to 48 per cent or 58 mt. The other significant feature is that within the 30 per cent overall share of organized dairies, the major 20 per cent (24 mt) will be accounted for by the private sector. The cooperatives and government dairies will handle 10 per cent or 12 mt of milk, which will be lower than that of the organized private sector.70

Srikanth and Vasudev (2006) studied and an attempt has been made to quantify the level of consumption, production, and marketed surplus of milk in Karimnagar district of Andhra Pradesh. Better feeding followed by congenial weather conditions during the winter has a positive effect on milk production. It was also interesting to note that in relative terms, marketed surplus was more in summer (ranging from 58.5 percent to 60 percent) compared to that in rainy season (50 percent to 56 percent). On an average, marketed surplus during the year ranged between 55 percent in the case of small farmers to 57.2 percent in the case of medium farmers. But in all the categories of farmers, the consumption of milk was above the recommended level, i.e., 250 gm/day/person. With the disposal of marketed surplus of milk through different agencies, it was evident that the co-operatives and milk vendors emerge as major procurement agencies (more than 70 percent) in all categories of farmers. Majority of the small and medium farmers preferred milk vendors while large farmers preferred milk co-operatives to sell their surplus milk. The large family size, education level of family had influenced the consumption pattern of milk. These lead to consume more, resulting in shrinkage of marketed surplus.71

Bhowmik, Sirohi and Dhaka (2006) analysed that the net cost of milk production from crossbred cows is nearly half of the same from local cow, thus in the economic interest of the farmers, strategies aimed at crossing nondescript cattle with superior germplasm should be intensified by the concerned state department. The contribution of technological component in higher milk production for cross breed cows is about 68 percent, thus, propagation of crossbreeding in the region has the potential to ensure reasonable returns of investment. The annual value of inputs saved in one district alone, covers 87 percent of the expenditure on dairy development made by the state in four years. Therefore, from the planners’ perspective also, it is a winsome proposition72

Bhowmilk (2006) opined that the Cost and returns from milk production were estimated separately for local and crossbred cattle. The gross cost of maintenance was worked out as the sum of fixed and variable costs items. The net cost was arrived at by deducting the value of dung from gross cost per milch cattle per day was divided by the average milk yield per day of the respective breed. The net return was calculated by deducting gross cost from gross return.73

Chauhan, Singh and Raina (2006) examined the economics of manufacturing of different dairy products, viz. ghee, full-cream milk, standardized milk, toned milk, double-toned milk, skimmed milk and ice-cream (processing only) have been reported. The study has been conducted in an ISO-9002 dairy plant situated in the north-eastern part of Haryana. It has been observed that all the products, except the double-toned milk are being produced above the recommended breakeven level. A comparison of unit manufacturing cost with unit price received by the plant for different products has revealed that ice-cream manufacturing has been the most profitable proposition among different dairy products, and standardized milk has provided the maximum profit margin among the milk pouches manufactured during the study period, 2000-01. The double-toned milk has revealed a loss. Therefore, the study has suggested that the quantity of double-toned milk production should be raised at least equal to the recommended break-even level to avoid losses, if there is a market demand for this product or the resources of this product could be shifted to some other profitable products.74

Dutt (2001) opined that the Cattle and buffalo production is an integral form of rural economy and contributes substantially to the family income. Milk provides 3% of animal protein and almost 100% of animal fat in the daily diet viewed that India’s estimated milk production in the year ending March 1999, 74 million tonnes, was 13% of the world’s milk production. This has been appreciated by the United Nation’s Food and Agriculture Organization (FAO), which has declared India as the world’s largest producer of milk. FAO-estimated milk production of 71 million tonnes

by USA in the same year is placed second in the list. Data on estimates of milk deduction in the world and India during 1985–2000 reveal that a linear regression $Y = a + bt$, where $t$ is the year and $Y$ the estimate of milk production, is the best fit to the data. For India, the estimates of $a$ and $b$ are 41.14 and 2.28 respectively, and for the world they are 501.85 and 3.80 respectively. This implies that an annual increase in estimate of India’s milk production is found to be 2.28 million tonnes ($P < 0.01$), whereas it is 3.8 million tonnes ($P < 0.01$) for the world. Assuming that the rate of increase will remain the same for the year 2010, estimates of India’s milk production will be 100.52 million tonnes, whereas the world’s milk production is estimated to be 600.56 million tonnes. The demand for milk products would increase as a result of increase in national GDP. In order to meet the demand, it is essential to have consistent increase in milk production, which will be possible on successful implementation of ‘Operation Flood’ and evolution of new animal breed. 

Khem Chand and Gajja B.L. (2004) In their attempt to analyze the livestock composition, population pattern and factors affecting it in the arid zone of Rajasthan. For the purpose of study, secondary data of livestock population pertaining the animal census year 1961, 1966, 1972, 1977, 1983, 1988, 1992 and 1997 were collected. For the estimation of fodder availability, data on crop production, hallow land, culturable waste and policy area etc. were collected for the year 1996-1997. The requirement of fodder and nutrient intake was also estimated for the region. The study revealed an increase in buffalo population in the region while a sharp decline was observed in per cent share of cattle in the total livestock population. The major deficiency of fodder was felt in the case of bovine in the array region. The factors responsible for increase in buffalo’s population are increasing cropping intensity and rural population density in the arid region while the same factors resulted in a decrease in cattle population. The arid region farmers also adopted buffalo as drought resistance strategy since unproductive buffalo can be sold during drought, which does not affect the religious sentiments as in the case of cow. The study recommends storage of foliage produced in good monsoon year for use in the deficit period. The government of India is also, implementing a scheme for this

region for developing and rejuvenate the pasture land to be available on the large scale to improve the livestock situation in this region.\textsuperscript{76}

\textbf{Khare, Sharma and Singh (2003)} are of the opinion, Milk collection was higher in healthy season (from September to February) and lower in unhealthy season (from March to August). In spite of more production in the month of July and August, the producer members of the society were not in position to transport their product due to lack of all weather roads. As, the distance of the milk producer’s co-operative society increases form the dairy plant, the volume of milk collection decreases, the milk collection was higher in those societies, which are well connected to the dairy plant. The variable cost was the main component of cost of milk production and the maximum cost incurred in the purchase of feed and fodder and in labor management. Low price of milk was the most important problems in the collection of milk, followed by lack of cold storage, delay in payment, inadequate water for animals, lack of all weather roads, small quantity of marketable surplus of milk, improper treatment, lack of cross breed animals and uncertainty of electricity. Hence, efforts should be made to solve all there constraints.\textsuperscript{77}

\textbf{White, Benson and Washburn (2002)} in their 4-yr study examined total lactation performance of dairy cows in two feeding systems: pasture-based and confinement. Spring and fall calving herds were used and each seasonal herd had 36 cows on pasture and 36 cows in confinement with 282 Holstein and 222 Jersey cows included over seven seasonal replicates. Pasture-fed cows received variable amounts of grain and baled haulage depending upon pasture availability. Confinement cows received a total mixed ration with corn silage as the primary forage. Data were collected on milk production, feed costs, and other costs. Pasture-fed cows produced 11.1% less milk than confinement cows. Across treatments Jerseys produced 23.3% less milk than Holsteins, but calving season and various interactions were not significant. Feed costs averaged $0.95/cow per day lower for pastured cows than confinement cows. Feed costs were lower for Jerseys than Holsteins and for


cows calving in spring. Income over feed costs averaged $7.05 ± 0.34 for confinement Holsteins, $6.89 ± 0.34 for pastured Holsteins, $5.68 ± 0.34 for confinement Jerseys, and $5.36 ± 0.34 for pastured Jerseys; effects of breed were significant but treatment, season, and interactions were not. Economic factors such as labor for animal care, manure handling, forage management, and cow culling rates favored pastured cows. Higher fertility and lower mastitis among Jerseys partially offsets lower income over feed cost compared with Holsteins. Milk production was lower in this study for pasture-based systems but lower feed costs, lower culling costs, and other economic factors indicate that pasture-based systems can be competitive with confinement systems.78

Hemme, Garcia and Khan (2002) in their opinion 130 million people in Bangladesh should consume at least 120 g of milk per day (as fluid or processed in any form), the annual milk demand would be about 5.70 million tons. This estimate of milk demand in Bangladesh demand is over two and half times FAO’s recorded national milk production for the country (for 2002). Therefore, meeting Bangladesh’s potential milk demand is a huge national task and the question arises how well-positioned Bangladesh is to meet this milk demand. This study shows that the 2 cow farms (BD-2) not only cover full economic costs, but can produce milk at a cost almost as low as the larger farms included in the study. This should be very encouraging for more than 7.2 million Bangladeshi families involved in small scale cattle rearing, of which few make a profit and most consider it a highly risky activity. The small farm (BD-2) is competitive at the national level but not at the international level. The cost of milk production of all farms in comparison to larger farms in India, Pakistan and Oceania is around 50% higher. Assuming a liberal trade of dairy products in the future all farms analysed will have to improve the production systems significantly to gain from the growing demand of dairy products in the country. Further studies of small dairy farms in Bangladesh need to include a landless milk production system, a typical goat milk production system and a more exhaustive evaluation of the non-cash benefits obtained from dairy cattle (like draught

Moreover the cost reduction potential of the farms by improvements in farm management should be analysed.\textsuperscript{79}

\textbf{Singh and Singh (2000)} revealed that milk production in commercial dairy herds is an economically viable and profitable enterprise in Bikaner city. It generated around 973 man-days of gainful employment per year in an average dairy herd. The contractual procurement and auctioning system of milk has helped a lot in increasing the number of dairy herds in the city, the optimum herd size analysis has suggested the scope for further increases in the number of milk animals in the dairy herds. Though these dairy herds have helped in increasing the supply of milk, they have created many problems too. The herd owners many times set their animals free, which generally choked due to disposal of animal waste in it. These problems are created by around 40 percent of dairy herds which are maintained inside the city. The shifting of dairy herds to the outskirts of the city can solve the problem. Another way to improve upon the situation is by developing a modern dairy complex along the lines of Aarey milk colony, Mumbai with provision of good infrastructure facilities.\textsuperscript{80}

\textbf{Prasad (1999)} observed that the concentrates contributed as an important input in the milk production having significant and positive regression coefficient for all the breeds of buffaloes. The dummy variables for the both the winter and rainy seasons had negative regression coefficients for the local and graded buffaloes but for murrah buffaloes the same were positive and significant for both the seasons. This shows that more yields are realized in the summer season for local and graded buffaloes while higher yields are realized in the winter and rainy seasons for murrah buffaloes. This clearly demonstrated that the summer season contributed significantly to the milk yield in the case of local and graded buffaloes, while the winter and rainy seasons significantly facilitated the murrah buffaloes in increasing the milk yield as compared to the other season. The higher milk yield among the local and graded buffaloes during the summer season might be due to the reason that a majority of


these buffaloes might have calved during the summer season itself on the sample farms. Inter-seasonal fluctuations in milk production can be minimized by adjusting the calving dates of buffaloes. The milk yield of the animals can be stabilized through advance planning of calving dates of ensure continuous milk production on the farm through adjustment of mating dates of the buffaloes. This means that at a given time all the buffaloes would not go dry and at least one or two animals would be giving milk to the dairy farmers.81

Charles, Fullhage and Donald (1999) conducted a comparative analysis of two nutrient management systems for Missouri dairies. Annual ownership and operating costs were computed for herd sizes of 100-1,000 cows. A break-even analysis was also provided for irrigation systems used with the lagoon system. Lagoon systems consistently handled dairy nutrient at a lower cost than liquid tank systems for all herd sizes. Even though nutrients from liquid tank systems are more concentrated and valuable than nutrients from lagoon systems, the liquid system's net cost was 1.5 to 2.4 times greater than the lagoon system's net cost, depending on herd size. The liquid tank system also required a 5 to 10 times larger plant filter area than the lagoon system. This can be an important consideration for operations with limited acreage. Dairies with more than 300 cows benefited from purchasing a travelling gun irrigator rather than relying on a custom operator to remove nutrients from lagoon systems.82

Rajendran and Prabakaran (1998) pointed out the present Scenario of milk Production in India. India’s agriculture has been dominated by the belief that its base is in crop production. Also, the focus should be shifted from quantity to quality in the daily diet by enhancing the intake of animal proteins, the major source of which are milk, eggs and meat. In recent years, one unfortunate trend has seen the decreasing per capita availability of pulses, the only major source of protein for the large majority of the population. The nutritional demand has to be bridged rapidly and the

milk, egg and meat provide affordable alternative sources of protein. Recently, the annual rate of the growth in milk production has been encouraging which has gone up from 4.5 percent in the seventies to 5.7 percent in the eighties. Today, India ranks as the World’s second largest milk producer after USA. By then, India’s milk output is expected to range between 84 million ton at the minimum and 88 million tonnes at the maximum. India’s per capita consumption of milk does not commensurate with its ranking as world second largest milk producer. However, the present per capita availability of 214 grms / day (78 kgs / year) is much higher than the average of 26.27 kg / year for the developing countries in Asia / Pacific region. Today milk is India’s second most important agricultural commodity in terms of value of its output, ranking after paddy, but much above wheat.83

Verma, Singh, and Raj (1997) conducted a study in Karnal town of Haryana to ascertain deterioration in milk quality during marketing and to estimate real margins in milk trade. It was reported that in the lean seasons milk supplied to consumers by producers directly was of better quality at an average price of Rs.5.68/- per litre than that was sold to Halwai and vendor at Rs.4.75/- and Rs.4.04/- per litre respectively. Raju (1992) on consumer’s perceptions about milk marketed by Vijaya cooperative Dairy in Hyderabad revealed that Vijaya dairy milk had powdery smell which used to easily get curdled compared to vendor milk and buffalo farm milk. Consumers judged the quality of milk fat content, color and taste, thickness, freshness, hygiene, curd formation and flavor of the raw milk. A majority of consumers, irrespective of all income groups, considered thickness, taste curd formation to be most important factors in judging the quality of milk. In Orissa, Omfed milk was perceived better than unbranded milk on thickness criterion whereas it lagged behind on taste and freshness.84

The above review shows that most of the studies have been undertaken especially in Gujarat, Karnataka, Punjab and Kerala. Some of the studies have been undertaken by some research institutions in the areas covered by Cattle development

projects. Some have emphasized on the need of operation Flood and milk-producers Co-operative societies and some have rejected it under Indian conditions. No significant study has been made so far in dairy industry, particularly regarding about the organization and management. The managerial and organizational aspects of dairy industry have been generally ignored. Hence it is proposed to undertake a deep study of the organization, working and management of all Co-op, dairy units in the state of Haryana. The present study seeks to fill this research gap.

2.3.0 SCOPE AND SIGNIFICANCE OF THE STUDY

For promoting the interest of the producers and consumers, there is a need to promote milk supplies to meet the ever increasing demand. Institutional support for expansion of milk supplies for rural areas, covering issues relating to the animal health care, improvement in breeding, extension services and feed supplies are essential. Haryana Dairy Development Co-op Federation (H.D.D.C.F.) was set up to play an important role for growth of dairying in the State of Haryana. Haryana Dairy Development Co-op. Federation identifies and promotes dairy development projects by undertaking various schemes launched by National Dairy Development Board (N.D.D.B.) and State Government and Developed infrastructural facilities by setting up milk producers unions in the State of Haryana for the year 2008-09. When the researcher undertook this research work, there were six Co-op. milk unions, catering to the needs of the State. For a detailed programme and a deep investigation of their management, working and economic viability, all the five District Co-operative Milk Producers Unions were included in the study.

In the present study efforts have been made to provide a systematic framework for the analysis of organizational structure of Co-operative Dairy Industry in Haryana. The study will cover all the District Co-operative Milk Producers Unions Ltd. Therefore, the present study will have a great relevance and significance as it will help in improving the working and organization of Dairy Development Programmes for the growth of dairying in the state.
2.4.0 OBJECTIVES OF THE STUDY

Considering the tremendous scope for the development of dairy industry and imminent need for preventing yearly denudation of a large number of milking animals for future assurance against wanton depletion of invaluable seed material which is the state’s trade in milk stock to major cities, the Government of Haryana immediately after the formation of state decided to form an autonomous body: The Haryana Dairy Development Co-op Federation (H.D.D.C.F.) in the State. The objective laid for the federation was to provide a remunerative, regular and organized market for milk produced in rural Haryana and to usher in a socio-economic climate for the innumerable farmer producers of milk which will prevent the time old trade practice of parting away with the prized stock. The present study entitled, “The Working and Organization of Co-op. Dairy Industry in the State of Haryana” has been undertaken to examine and analyze the existing organizational and managerial structure of dairy Co-operatives in the State of Haryana. The present study would be designed to accomplish the following main objectives in relation to the topic of our research.

1. To study the pattern of development of cooperative dairy industry in the state of Haryana since its inception.
2. To study and analyze the existing organizational structure of the cooperative dairy industry with special reference to District Cooperative Milk Producers Union Ltd.
3. To evaluate the economic aspects of marketing infra-structure in dairy cooperatives.
4. To analyze the financial structure and financial health of milk cooperative dairying in Haryana.
5. To find out shortcomings, which might have retarded the functioning of cooperative dairying in Haryana?
2.5.0 RESEARCH METHODOLOGY

This chapter deals with the research methodology that is deployed to achieve the research objectives. It is stated that need for research arises with any problem. Any research study has three main aspects; it should have clearly defined objectives, data gathered in a very systematic way and its interpretation. Research methodology in any research study, must be in line with aims and objectives. Research methodology is the total sum of the philosophical assumption and justification of the study. Research methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. Research methodology includes various steps in order to conclude results, first one is defining the problem, 2nd is setting up of hypothesis, 3rd is collecting, and organizing data, 4th is evaluating the collected data and making deductions and fifth is drawing conclusion and testing the conclusions to see if they fit in with the hypotheses. On the same lines, research methodology may be defined as a mean to solve the research problem in a systematic manner. When a research study is undertaken, the most important thing is how the problem of research is formulated, what method of data collection and data analysis is adopted, which is appropriate for the current research study in order to make conclusion. The method adopted to undertake research must be given due attention as it impacts accuracy and reliability of the obtained results. Research methodology entails systematic study aiming at solving research problems. ‘Research simply means ‘search for knowledge’.

Research comprises of defining and redefining problems, formulating hypothesis or suggested solutions, collecting, organizing and evaluating data making deductions and reaching conclusions’. It is one of the most important areas of any thesis in order to get deep knowledge of the topic so that important conclusions and results are drawn easily. It includes following steps first one is to identify the problem, and then decide about the research design as well as sources from where the data is collected. Present study is descriptive in nature and case analysis of Cooperative Dairy Industries in Haryana. A period of ten

86 Loo & Alan I., Mixed methods research: don’t – “just do it”, Qualitative Research in Accounting & Management, Vol. 8 Issue 1, 2011, 22-38.
year has been taken for the purpose of analysis so that some useful results may be
drawn. All the District Co-operative Milk Producers Unions Ltd. / milk plants have
been selected for the study. A brief description of the sample design and methods of
data collection for the present study is as follows

2.6.0 PROCESS OF RESEARCH

Research process means step followed in order to conduct the research work. Similarly for this research study first of all, the research problem is identified, and then a research design is formulated in order to decide about the conceptual framework for the research. After formulating research design the researcher has identified the sources from where data can be gathered to accomplish the research objectives. For this research study data has been gathered both from primary & secondary sources. After identifying sources a structured open-ended questionnaire was designed to collect data from customers. After collecting the data from respondents this data were analyzed using Bar Diagrams, Pie Charts & Chi Square test & then interpretations were made thereafter. Various steps involved in conducting a research study are as follows:

1. In order to conduct a research first step is to identify the research problem for which research has to be conducted. In order to identify a research problem following things should be taken into consideration which are as follows:-
   - Find out why the information is being sought.
   - Determine whether the information already exists.
   - Determine whether the question really can/should be answered.
   - Use exploratory research to define background of the problem
   - Determine relevant variables

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2. Second step is to decide about the research design for conducting the study, there are three research design that are commonly used first one is descriptive, second is exploratory and causal research design.

3. Third step is to decide about the sample and sampling techniques used, the size of respondents depends upon the time duration available for the research study.

4. Next step is to collect the data; there are two sources from where the data is collected first one is primary sources and second one is secondary sources.

5. Fifth stage is to analyze that data in order to give recommendation; it can be done through presenting the data in form of tables, pie charts, by applying tests such as chi square test in order to get important results.

The last step is conclusion and making a report to communicate about research work to all.

2.7.0 RESEARCH DESIGN

In this study descriptive research design has been adopted as it involves a survey. The main aim of which is to gather and analyze relevant data that will provide the necessary information.\textsuperscript{89} Now come to the meaning of descriptive research, it refers to that study main emphasis of which is on explaining the features or attributes of specified person or class. In this study, observations, questionnaires, examination of records, etc are used for such studies. Through this it is possible to design about the framework in which the research work is performed. In order to give support various evidences are also collected. The present work is based on a Descriptive method heavily depending upon Primary data which means data which is collected first time by the researcher. In order to conduct research for the present study, data is collected from HARYANA state.

2.8.0 DATA BASE AND METHODOLOGY

The present study is based on both primary and secondary data collected from the field survey and from Government departments. Primary data were obtained through personal visits to the Dairy Industries (District Co-operative Milk Producers Union Ltd.) and informally interviewing the members of the managerial staff as well as technical staff. A well designed questionnaire was distributed to Chief executive officers of these units to capture their view on policy matters. Secondary data were collected through several sources, such as office records maintained by District Cooperative Milk Producer Union Ltd., Haryana Dairy Development Cooperative Federation (HDDCF) Panchkula, Journals, Statistical Abstract of Haryana, Relevant researches and Cooperative Society Act. 1984, rules and by laws. The researcher, for obtaining general information and data relevant to study, made visits to NDRI Karnal, M.D. University Rohtak, Kurukshetra University Kurukshetra, H.A.U. Library Hisar and Library of the Industries Department, Haryana Chandigarh.

2.9.0 LIMITATIONS OF THE STUDY

In the present study efforts have been made to analyze the most important aspects of cooperative movement i.e. working and organization of Cooperative Dairy Industries in Haryana. During the field investigation some officials of the dairy industries (Milk Plant) refused to give information fearing that the researcher might cause any harm afterwards. This prevented the collection of data in an orderly and sequential manner. At the same time there were executives and officials who were ever willing and enthusiastic about explaining various problems being faced in the dairy industries (Milk Plant).

The research work has been completed under the following main limitations:

- For an individual researcher certainly there are some constraints and restraints of time, money and sufficient authority to enquire about, hence only a period of 10 years is selected for this study.
- The study is largely based on secondary data, hence the limitations of such data may inherently be found in it.
The techniques used in the study are subject to their own limitations, which might have affected the findings of the study.

Certain suggestions of the study have been made on the basis of the researcher’s observations and the discussions with the staff members of the selected milk plants. However, no systematic attempt was made to study this aspect in detail.

The employees might have not given the true picture due to the fear of bad repercussions.

Of course, every possible effort has been made to achieve the goals of the present study. Despite these limitations the researcher with his sincere efforts has tried to find out the significant conclusions on the subject to the study.