ISSN: 2249-7196
IJMRR/June 2015/ Volume 5/Issue 6/Article No-2/341-350
Bhagyashree S. Kunte *et. al.* / International Journal of Management Research & Review

A LITERATURE REVIEW OF INDIAN DAIRY INDUSTRY

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ABSTRACT

The Basic intent of the study is to undersand the current scenario of dairy industry in India and various issues of the stakeholders of the industry. This is a review of research articles related to dairy industry. 24 research articles referring data for different states of India are randomly selected.14 out of 24 papers were based on primary data collected from dairy famrers (members/ non membersof cooperative societies). The major issues revealed were related to lack of fodder and concentrates, scarcity of veterinary and diagnostic services, lack of information and technological awareness. These were common issues faced by dairy farmers in most of the regions of India. Some of the issues were area specific like in Assam milk and milk products were not the components of daily consumption basket of people in the state which is not the scenario in otherstates of the country. The reaming 10 studies were either related to cooperative and private dairy plants, cooperative federations or general dairy scenario of the relevant state. Procurement cost was found to be the major component of total costs followed by processing cost. These studies evaluated the economic viability of concerned dairy units.

INTRODUCTION

The wilful efforts of people and government, reflected through successful implementation of programmes like "Operation Flood", transformed India from its deficit state in milk production to the world's largest milk producing country. India has the largest cattle and buffalo population in the world. Cows and buffaloes are the main miltch animals, contributing 96% of the total milk production of the country. However the average yield of Indian cows is among the lowest, though the yield of Indian buffaloes is modest. The average milk yield of buffaloes and cows put together is much less than the global average. There are significant regional variations in the structure of dairying in the country. There are different issues faced by dairy industry in India, some are area specific while some are common.The present study is intended to understand these issues and Challenges faced by dairy stakeholders.

OBJECTIVE OF THE STUDY

The basic intent of the study is to have an overview of Indian Dairy Industry. To understand the problems faced by the dairy sector units, the prose and corns of various issues. The study is carried out to understand the magnitude of the research work carried out in the field and understand the unresolved issued if any that can pave the path for further research in the field.

RESEARCH METHODOLOGY

The study is based on available literature extracted from different databases. This is a qualitative study intended to understand the issues related to Indian dairy industry, the structure, different players in the sector; the role played by different government institutions, the programmes run by the government and the success or failure of these programmes in dairy development.

The articles are gathered from different databases like J- gatePlus, Ebsco host.com and Google. The basic purpose is to understand the evolution of dairy industry in India, the progress achieved so far, the programmes, efforts and activities responsible to achieve the progress. The study is based on total 24 articles bi-fergatedasfollows:

S. No.	Region	State	Total of the Region
1	Southern Region	Tamil Nadu(3), Karnataka(2), Andhra Pradesh(1)	6
2	Western Region	Maharashtra (4), Gujarat (3)	7
3	Northern Region	Haryana(2), Rajasthan(1)	3
4	North Central Region	Bihar(1), Utterakhand(1)	2
5	Eastern Region	West Bengal(2)	2
6	North East Region	Assam (1),Nagaland(1), NE States (2)	4
		Total	24

LITERATURE REVIEW

The review is arranged in the sequence as given below

➢ The authors 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 primary data that they have collected form one cooperative and one private dairy plant, five transport routes and six chilling plants. The authors have observed that the procurement cost per litre of milk was higher for the co-operative dairy plant than the private plant due to increase in the transportation, chilling and reception costs. The value chain analysis revealed that the products such as peda, khoa and SMP could earn a higher value after passing through the value chain in the co-operative plant while ice- cream, Mysore and ghee in the private plant. The marketing margins and marketing efficiency was found higher in toned milk, standardized milk and butter for the private plant and in full cream milk, ghee and SMP for the co-operative plant [1].

➢ The study was conducted to analyse the marketing efficiency of cooperative and privet dairy plants in Tamil Nadu. To evaluate the marketing efficiency, primary data was collected from 20 milk producers' cooperativesocieties, 20 milk collection centres, 20 transportation routes (from cooperative and private each). The marketing efficiency of cooperative dairy plant for all dairy products has been observed relatively less than that of private dairy plant, except toned milk [2].

➢ The study was intended to develop a price determination model for milk. In developing the price determination model different factors like input prices, non-price factors like technology were considered. The authors through the study developed a price model based on cost of production. According to them the model can be used to project the future price of milk. The authors revealed that the elasticity of cost of production with respect to prices of

variable inputs was positive and less than one. The prices of dry fodder and concentrate had a major impact in raising the cost of milk production for buffalo milk. Based on the primary data, collected from 160 households in financial year 2002-03 the study explained that the milk price should be adjusted within that range where net income elasticity floats between zero and one [3].

- The study was aimed to find the impact of performance of dairy cooperatives on milk production, income and employment. The primary data was collected from four milk cooperatives from Kolar District of Karnataka. A trend analysis of physical indicators like total membership, total employees and total milk production showed an increasing trend year on year for the period 1995-96 to 2004-05. And for the same period financial performance was analysed based on financial indicators like share capital, sales value, net profit net worth etc. It was observed that all financial indicators showed a positive trend during the period. The employment generation and income earned by the members of dairy cooperatives were higher compared to the non members because the members of cooperative societies received different services from the societies at low cost or free of cost [4].

- The paper assessed the impact of Karnataka Dairy development project on dairy development in Karnataka.The Primary data was collected through survey of 21 villages with cooperatives And 10 villegeswith non cooperative dairy units. The author found a positive impact of the project on milk production, as the average production in villages with milk cooperatives was twice the production in villages without cooperatives.The increase in milk production was achieved through a shift in herd composition. The indigenous cows were replaced by cross bred cows or bufellos. Project led to increase the herd size and investment in cattle. The project had no impact on wage earnings and changes in labour pattern however it had an impact on milk prices in cooperative villages [5].

- The study dealt with the concept of profitability, measurement of profitability in relation to total investment, sales and shareholders' funds in Dairy Industry in Andhra Pradesh during 2001 to 2011. It also dealt with the evaluation of earning power, analysis of operating efficiency, Analysis of financial efficiency and measurement of financial health of Dairy Industry in Andhra Pradesh, using Z score analysis. The data was collected from 5 dairy enterprises of Andhra Pradesh for a period of 10 years (2000-01 to 2010-11). Four out of five dairy units were found financially sound.While one was found in bankruptcy zone [6].

- It was a case study of "Gokul" cooperative union, western Maharashtra. A SWOT analysis was carried out for the cooperative union. Through a pretested interview scheduled, data was collected from 150 dairy farmers. The study explained about the 46 livestock services delivered by "Gokul" and the feedback of 150 respondents about the services rendered. The author expressed his opinion that the union had successfully strengthen the dairy production and marketing by providing the livestock services. However the author found that the union had to improve upon the quality of the services rendered and had to reduce the cost attached to these services [7].

- The study was carried out to understand the issues faced by the dairy farmers and the staff members of the cooperative union. With this purpose the data was collected through interview method, from 150 farmers and the staff members.The constraints were divided into

4 categories as Human Resource, Financial, Policy-Related and Administrative Constraints. Lack of veterans, lack of medical facilities, high cost of concentrates, complex insurance procedure were the major constraints expressed by the farmers. Whereas lack of job satisfaction, low payment, poor coordination among various agencies, lack of proper diagnostic and cold storage facilities were the major issues related to cooperative staff [8].

- The author studied marketing and distribution strategies of different types of dairy units. The study was based on the data collected from cooperative, private and public sector dairy units of Kolhapur district of Maharashtra. It was found that all the dairy units advertised their product only at local level. Local newspapers, local TV/radio channels, point of purchse advertisement were the advertisement media selected.A few had their own out lets at various places of Maharashtra. Majority of them did not have a wide distribution network [9].

- Agriculture and allied sectors like dairy are not commercialised in India. They are still considered as source of livelihood for millions of small farmers. There is a need to comercialise agriculture and dairy industry in order to face the world wide competition. The study was intended to find the commercial viability of different size of dairy units. An analysis of capital investment, cost, return and profitability was carried out, based on the data collected from 40 dairy farms of Ahmednager district in Maharashtra.The selected farms were of three types, large medium and small. The commercialisationindairy leads to increase in production and income. The cattle productivity in terms of milk was found higher for small dairy farms compared to medium and large farms. The authors concluded that the dairy farming is highly capital intencive but the investment pattern was different for small and large farms as large farms invested more in cattle while the major investment of small farms was in development of infrastructure .Commercial dairy farms preferred to have their own fodder cultivation instead of dependence on purchased fodder. As feed cost was the highest contributor of the total cost [10].

- A trend analysis of composition of different spicies in total milch animals and the productivity of these spicieswas carried out based on secondary data for 18 years: 1990-91 to 2008-09. The authors found that the local cows have consistently improved their performance across the state(Gujrat). The increase in number of animals was found as the main driver of the growth in milk production. However beyond a limit the incremental number was found unfaverable.The authors have suggested that the milk yield of the milch animals needs to be paid attention for sustainable growth of milk production [11].

- The performance of dairy industry of Gujrat was analysed and appraised through the study. The study assessed financial health of 9 district milk porducer's unions of Gujrat based on the secondary data for 10 years (1993-94 to 2002-03). The cost components of sales were analysed and the reasons of high costs were identified.It was revealed that the procurement costs was about 75% to 80% of the total cost. Increase in transportation cost year after year led to increase in procurement cost.The processing expenses were the second largest cost in the total cost structure, followed by personnel expenses [12].

- The study was carried out to analyse the effectiveness of dairy cooperatives and the economies of scale in milk production. The study included varying cost components (such as fodder, shelter, cattle feed, labor cost) as well as varying costs of milk produced during the

summer and winter.A survey was administered covering 300 milk producers. It was found that though buffalo milk earned higher procurement price than cow milk, owing a buffalo resulted in negative income.But still there were more farmers who own buffalos than cows. Milking found to be the secondary source of earnings for most of the farmers. It was found that the total costs including labor resulted in a negative income for both cow and buffalo owners. The author commented that milking is an economic activity that generates wages (similar to a job) rather than a business [13].

- An ISO-9002 dairy plant having installed capacity of 60,000 litres per day (LPD); situated in the north-eastern area of the Haryana state was selected for the study. The costs and revenue generation for the four products were analysed. It was observed that raw material was the major cost component, contributing 90% of the total costs, followed by packaging cost for the entire four products. The study has revealed that all the products, except the double-toned milk were being produced above the calculated break-even levels.Ice-cream manufacturing was found to be the most profitable proposition [14].

- The author has studied the operational performance of MILKFED (The Punjab State Cooperative Milk Producers' Federation Limited)and HDDCF (Haryana Dairy Development Cooperative Federation Ltd) on the basis of various indicators; using 5 years financial data.It has been observed that the MIKFED and HDDCF have set up their milk booths in urban and semi-urban areas but they have no milk booth in the rural areas.It was found that societies of HDDCF were reduced in the year 2009-10.The proportion of interest income to total income of HDDCF was found higher as compare to MILKFED but Milkfedwasearning more from other sources as compared to HDDCF. It has been found that the HDDCF spent larger proportion of total expenses on its employees as compare to MILKFED but Milkfed had utilized its resources more efficiently than HDDCF. HDDCF earned high rate of return on its investments as compare to MILKFED. The author concluded that financialperformance of HDDCFwas better than MILKFED [15].

- A comparative analysis of economic performance of members and non members was the basic intent of the study. A comparison of cost and returns of milk production among different herd size was also carried out. In order to serve these purposes, data from 75 members and 75 non members from Alwar District of Rajastan was collected. The Per day net maintenance cost was found to be higher for membergroup than that of non-member group. It was found to be higherin case of buffalo than that of cow and also observed more in thesummer season.Per litre cost of buffalo and cow milk productionwas observed to be higher for the non-member as compared tomember group. Per litre cost of buffalo milk productiondecreased with increase in herd size across differentseasons while same trend was not observed in case of cow milkproduction. Further, it was found higher in summer season. Daily net return was found relatively higher in member group ascompared to non-member group and also found higher in winter. Per litre cost of buffalo and cow milk productionwas observed to be higher for the non-member as compared tomember group [16].

- In this study the miltch animals were categorised into crossbred cows, local cows and buffaloes. It was found that the farmers with large herd size(10-12); preferred crossbred cows against the local cows or buffaloes, while farmers with small herd size (6); preferred local

cows and buffaloes. The author found that improved scientific dairy farming practices and increase in proportion of crossbred cows in the total miltch animals, led to increase in average daily milk production in the state. It was further observed that Increase in herd size led to decrease in the productivity.The members of single family maintained dairy animals more carefully than those of joint family. Herd size, period, season and type of animals had significant effect on average daily milk contribution by dairy farmers to DCS milk pool. Herd size did not differ with each other with respect to their share in consumer's rupee. The study further analysed that per litre milk production is one of the components for farm level decision making and it was found that per litre cost of milk production was comparatively low in case of crossbred cows (10.4) than local cows (13.99) and buffaloes (14.34). Per litre cost of milk production in urban areas was found relatively high in comparison to rural and semi-urban areas, probably due to higher feed, labour and fixed costs [17].

- This paper has explored the major constraints faced by cooperative and non cooperative dairy farmers on the basis of primary data collected from 320 dairy farmers. The important issues were included under 38 constraints under 5 groups —Infrastructural Constraints (11), Economic Constraints (10), Marketing Constraints (6),Technical Constraints (5) and Socio-Psychological Constraints (6). It was found that: The non-cooperative farms faced major constraints and high severity compared with cooperative dairy farms in expanding milk production. The financial problem was found to be the most significant constraint faced by the cooperative farms. Among infrastructural constraints, unavailability and infrequent visit of veterinary medical practitioners were the main constraints. Among marketing constraints, not excercising proper management practices by cooperative societies in favour of their attached farms was the major constraint. For technical constraints, lack of technical guidance was severe for members of cooperative farms. As regards the sociopsychological constraints, the lack of time due to busyin domestic / agricultural work and lack of cooperation and coordination among members were major constraints [18].

- It was a comparative study of cost, return and profitability of cooperative and non cooperative dairying in West Bengal. A survey of 320 household was conducted. The analysis of costs revealed that the variable cost was the major component of total cost for both cooperative and non cooperative dairy farms. Feed cost and Labour cost were found to be the two major components of variable costs. Interest cost was found to be the major component of fixed costs. NPV, IRR and Benefit cost ratios were the techniques used to evaluate the financial performances of dairy farms. The authors found that some cooperatives, named as good cooperatives showed better performance than rest of all dairy farms which included bad cooperatives and non cooperative dairy farms [19].

- Assam initiated organised development of milk processing way back in the mid 1960s. The total installedcapacity of pasteurisation and chilling plants in the State was 159 thousand and 28.5 thousand litres per day, respectively.However the study found that the created infrastructure was either largely defunct or grossly under-utilized.In the authors' opinion the poor performance of the plants was due to the establishment of milk processingunits without an appropriate assessment of output demand and input supply and ascertainment of economicviability of the plants. It was identified that the functional plants had a limited

product profile, high returns of marketed milk, substantial handling and curdling losses, low productivity of capital and labour and huge operationallosses.The study also found that the supporting institutional and infrastructural mechanism had not beenput in place and a systematic business and management plan to run the system had not been formulated. The factors identified by the authors for the poor performance were: Low procurement of milk, Lack of effective milk collection network, absence of non price incentives etc.Moreover the overall demand in the state was found less than national average [20].

- The study was intended to identify the issues of milk production and marketing in Nagaland. The analysis of data collected from 120 households revealed that lowavailability and high price of concentrate and lack of green fodder availability were the major production constraints. Low price of liquid milk was the major constraint faced by cooperative members and the delay in payments was the major constraint for non-cooperative members. It was found that the net returns were positive for cross-bred cows while net returns were negative for local cows.The net returns were highest for small farms as compared to the other two [21].

- The authors found that Assam, Tripura and Manipur were the highest milk producing states and with highest cross bred naimales, of north east region. Hence these states were slected for the study. Total 90 house holds were interviewed to find out the factors affecting the milk yield of cross bred animals.The major factors affecting the milk yield of crossbred animals in the N-E states were the technological and socio-economic constraints, which could be addressed by adopting improved management practices, better feeding practices, controlling of diseases and improvement of the socio-economic conditions of the farmers through training, education and enhancing access to the funds. Authors opinioned that addressal of these constraints will increase actual milk yield by about 66 per cent which will be sufficient enough to meet the deficit of milk requirement in the region. The authors have conducted a categorywise (small, medium and large) yield gap analysis and found that the highest increase in milk yield will be obtained on medium category households. The factors significantly affecting the milk yield at the household level according to the authors and as per the study were: allocation of humandays per animal, expenditure on concentrate, economic status of the farmer and availability of the green fodder in the surroundings. While no major breakthrough was expected immediately, improvement in these factors would meet the milk deficit in the region [22].

- The study was based on secondary data. The authors found slow growth of livestock sector in north east region. However they identified several factors influencing the households' decision to rear livestock like availability of labour, occupation, caste, farm-size, availability of irrigation, and access to information sources. The assured irrigation ensured the availability of fodder and further induced farmers to keep livestock. The study recommended that that the NE states should take technical, institutional and policy initiatives for the improvement of breeds, feed availability, and disease control and food safety of livestock.A comparative analysis of number of vaternary institutions, land under fodder cultivation, average milk productivity of different types of animals, statewise was also a part of the study [23].

CONCLUSION

24 research papers are studied to understand various issues related to India dairy industry. Each of these papers is related to a specific geographical region of India. These papers are for 6 geographical regions of IndiavizSouthern region, Western region, Northen region, North-Eastern region, North – Central region and Eastern region.

14 out of 24 studies were based on primary data collected from dairy farmers (members of cooperative societies and non members). The major issues reflected in these studies were relalted to the scarcity and high cost of fodder and concentrates, irregular and lack of veterinary and diagnostic services and lack of coordination among different government agencies. The Common findings of majority of the 14 research papers were as follows:

- Small herd size. The herd size on an average is found to be below 10-15 animals.
- Dairy farming is still in the form of a source of livelihood and not commercialised.
- Fodder and concentrate together contributes the highest proportion of the total costs.
- Cattles and Infrastructure are the two major contributors of total dairy farm investment.
- Imputed labour costs and cost of land used for fodder are many times not considered by the farmers, in deriving the earnigs from the dairy farming.
- The members of cooperatives receive the livestock services either free of cost or at a reasonably low cost. Hence the non members incurred more costs compared to members of the cooperatives.
- Cooperatives have positive impact on milk production and income generation.
- There is a shift to corssbredcattles from local cows and buffaloes.
- Though buffalo milk earns higher procurement price, owing a buffalo resulted in negative income.
- Per litre cost of milk decreases with increase in herd size.

The remaining 10 studies were either related to the performance analysis of cooperative or private dairy plants or federations or the general dairy scenario in the region selected. For the milk processing plants, the procurement cost was found the major component of the total costs, followed by the processing cost. For some dairy products; cooperative dairy plants were found cost effective while for some other products, private dairy plants were found cost effective. Some of the papers studied the economic viability of dairy plants or cooperative units.

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