CHAPTER 1

INTRODUCTION AND DESIGN OF THE STUDY

1.1 INTRODUCTION

India is the highest milk producer in the entire globe. India is well known as the ‘Oyster’ of the global dairy industry, with opportunities galore for the entrepreneurs globally. It might be a dream for any nation in the world to capitalize on the largest and fastest growing milk and milk products' market. The dairy industry in India has been witnessing rapid growth with liberalization. As the economy provides good opportunities for MNCs and foreign investors to release the full potential of this industry. The main objective of the Indian Dairy Industry is to manage the national resources in a manner to enhance milk production and upgrade milk processing using innovative technologies.

The crossbreed technology in the Indian Dairy Industry has further augmented with the viability of the dairy units by increasing the milk production per animal. Then subsequently milk production has also increased at an exponential rate while the benefits of an increase in milk production also reached the consumers from a relatively lower increase in the price of milk. The favorable price environment for milk producers for the Dairy Industry in India however appeared to have weakened during the 90's, a decline in the real price of milk being noticed after the year 1992 and then slowly regained its glories after 1992 to till now.
In India dairying from very much earlier is regarded as an instrument for social and economic development. The country’s milk supply comes from millions of small producers, who are dispersed throughout the rural areas. All these farmers maintain an average herd of one or two milch animals, comprising cows and/or buffaloes. Mostly ample labour and a small land base encourage farmers to practice dairying as an occupation subsidiary to agriculture. As income from crop production is seasonal instead dairying provides a stable which is a year-round income and also an important economic incentive for the small.

In India dairy business has been practiced as rural cottage industry over the years. Semi-commercial dairy started with the establishment of military dairy farms and co-operative milk unions throughout the country towards the end of the 19th century. Since Independence this Industry has made rapid progress. A large number of modern milk and milk product factories have since been established. The organized dairies in India have been successfully engaged in the routine commercial production of pasteurized bottled milk for Indian dairy products.

The growth of Indian Dairy Industry during the last three decades has been impressive, at more than 5% per annum; and in the 90's the country has emerged as the largest producer of milk. This is not a small achievement when we consider the fact that dairying in India is largely stringent that farmers in general keep dairy animals in proportion to their free crop and also are available for family labor with little or no purchased inputs and a minimum of marketed outputs. The existence of restrictive trade policy milk in the Diary Industry and the emergence of Amul type cooperatives have changed the dairy farming practices in the country. Farmers have gained the favorable price for their milk and for their production which was essentially a self-reliant one is which are now being transformed into a commercial proposition.
In India Milk production is dominated by small and marginal landholding farmers and also by landless laborers who in aggregate own 70% of the national milch animal herd. And as the crop production on 78% of the agricultural land still depends on rain, which is prone to both drought and floods, rendering agricultural income is very much uncertain for most of the farmers. Dairying, as a subsidiary source of income and occupation, is real relief to most of the farmers in the society. Usually one or two milch animals enable the farmers to generate sufficient income to break the vicious subsistence agricultural-debt cycle.

The Operation Flood which is the successful Indian dairy development programmed has analyzed that how food aid can be utilized as an investment in building the type of institutional infrastructure that can bring about national dairy development. Programmes like this, with similar policy orientations, may prove to be appropriate to dairy development in India in the early 1950's was commercially importing around 55000 tons of milk powder annually to meet the urban milk demand. Most of the significant developments in dairying have taken place in India in this century only.

Logistics has become one of the most important activity of all companies where has been treated as a strategic function to gain competitive advantage over a company’s competitors. Agribusiness as any other business is also using logistics tools in their supply chain to reduce the chain cost and more to improve their business efficiency as a whole. Transportation is one of the logistics activities that influence price of the product which in some cases can represent 25% of the final price. Milk collection of a dairy business plays an important role in the overall performance of the company. A poor milk collection will jeopardize the entire chain as it is the first stage of the manufacturing process. The cost of milk has two components: first, the cost of transport, and second, the cost of paying the farmer for the milk. Given that
the dairy has little scope for allowing the total cost to increase, then any increase in the price per litre paid to the farmer must be compensated by reduction in the cost per litre of collecting the milk. An efficient transport operation can allow a higher milk price to farmers, in turn attracting higher volumes that can lead to further economies of scale in milk collection. Because a reduction in transport cost can improve the price per litre that a dairy can offer its farmers, dairy companies have consistently attempted to adopt cost reducing initiatives. These have included introducing larger capacity collection vehicles and longer working days for the drivers. In dairies, schedulers control milk collection

The major challenge for the dairy sector is undoubtedly to raise milk production to meet the increasing demand that arises from the almost inevitable expansion of population and presumably growth of income. To meet this challenge, policies should be framed in such a way that they are less cost oriented. Adoption of appropriate technologies for production, procurement, processing and transportation are equally important aspects of dairy development.

The main reasons for developing dairies are to supply milk at the lowest possible price to consumers and to provide a viable subsidiary occupation to the unemployed rural poor so as to raise their earning capacities.

A supply chain is an integrated manufacturing process wherein raw materials are converted into final products, then delivered to customers. At its highest level, a supply chain is comprised of two basic, integrated processes:

- The production planning and inventory control process,
- Distribution and logistics process.
The production planning and inventory control process encompasses the manufacturing and storage processes, and their interface(s). More specifically, production planning describes the design and the management of the entire manufacturing process. Inventory control describes the design and the management of the storage policies and procedures for raw materials, work-in-process inventories, and usually final products.

The distribution and logistics process determines how products are retrieved and transported from the warehouse to the retailers. These products may be transported to retailers directly, and may first be moved to distribution facilities, which, in turn, transport products to retailers. This process includes the management of inventory retrieval, transportation and final product delivery.

These processes interact with one another to produce an integrated supply chain. The design and management of these processes determine the extent to which the supply chain works as a unit to meet required performance objectives.

1.2 THE IMPORTANCE OF THE STUDY

The milk industries remain strategically important to the economy with backward and forward links to several ancillary sectors. Under section 11 of the Indian Contract Act of 1872 a minimum of 25 or more individual owning milch animals can form a Primary Dairy Co-operative Society with one or more villages as its area of operations. Such persons have to approach the Circle Deputy Registrar (Dairying) office functioning at the District for further guidance. The members of Primary Co-operative Milk Society have to supply milk to the society, which will procure milk on quality basis, and they will receive payment once in 10 days or 15 days from the society. Milch animals are provided with free veterinary health cover, artificial insemination
and the supply of balanced cattle feed. Upgrading the milch animals and thereby improving their productivity in the long run for the benefit of the members aim at induction of farmers on modern animal husbandry practices.

During 2009–10, out of 9534 functioning societies only 6841 primary Milk Producers’ Co-operative societies were earning profit. To extend the financial benefits such as payment of milk costs in time, payment of bonus and ‘Patronage rebate’ to the milk supplying members of the primary Milk Producers Co-operative societies, every society has to function on profit. Keeping this in mind, effective steps were taken to improve the finances of the societies under the direction of Honorable Chief Minister. As a result of these effective measures 6841 functioning societies are functioning on profit though the remaining 2693 are under sick conditions.

1.3 STATEMENT OF THE PROBLEM

On par with the millennium of rapid population growth, the demand for food products has also grown equally rapid. The importance of the milk industry sector in our national economy occupies a key position. Though the milk industry is fast flourishing, there are problems in the milk procurement and milk transportation due to various reasons.

Milk is a highly perishable commodity and the surplus cannot be stored for a long time. The demand for milk is almost uniform throughout the year but the supply of milk cannot be maintained uniformly throughout the year because milk production is seasonal and production is high during October through March but low during April through September. The members of the society are much tempted to supply milk to the private milk traders. This affects the supply of milk to the society and to the union. The policies of the union are not clear and even the members of the society are unable to comprehend and follow the rules fully. Obviously it affects the total
performance of the Milk Producer’s union adversely. However a preliminary investigation by the researcher on the performance of Milk Producer’s Federation and Unions revealed that many Milk Producer’s Federation and Unions are incurring losses amounting to several crores, Krishnagiri union is also one among them. Another main reason for incurring losses is due to lack of knowledge on systematic network construction for collection of milk for the union from various societies located in the study area. In this study the researcher made an attempt to identify the non-viable routes and had tried to introduce transshipment method for collecting milk. Network analysis had been used as a major tool to reduce the cost prospectively. Many Milk Producers’ Unions like Anand Milk Union Limited (AMUL) are earning profits and are well utilized by the members of the society. Hence, an attempt has been made to identify the main reasons for the poor performance of the Krishnagiri union and the attitude of the milk producers towards the union.

1.4 OBJECTIVES OF THE STUDY

- To study the performances of the Krishnagiri District Co-operative Milk Producers’ union and Milk Producer’s Societies.
- To identify the factors influencing the supplier to provide milk to the society in the study area.
- To analyze the supply chain network of milk depot.
- To assess the sustainability of the Krishnagiri federation milk supply chain management.
- To identify the difficulties faced by the milk suppliers in providing milk supplies to their specific societies.
- To identify the problem faced by truck operators in the Krishnagiri milk supply chain network.
To find and suggest improvements in the depot operation for reducing the cost of transportation.

To make suggestions at the policy level with respect to the functioning of Krishnagiri milk producer’s federation.

1.5 METHODOLOGY

In thesis inductive theory construction is used which involves direct observation in natural settings and used to develop logic theory. Idiographic models of explanation are used.

Convenience sampling and multistage stratified random sampling method was adopted for the study. Krishnagiri district is one of the districts in India in which Operation Flood Programme-I have been implemented. This district was selected purposely as the sample district. Out of 43 milk routes only 30 milk routes in Krishnagiri were taken for display and only ten sample routes were taken for shortest route construction. They were divided as two blocks - one representing hill terrain and another, normal surface terrain. In the next stage 10 milk producers’ Co-operatives Societies were randomly selected from each block. In total 20 M.P.C.S were selected for the study. In each selected M.P.C.S. 20 members were randomly selected. The total size of the sample was 400 consisting of 200 from rural and another 200 from urban. The sample members were stratified on the basis of their land holding: marginal, small and big farmers.

1.6 TOOLS OF THE STUDY

- Basic supply chain logics.
- Simple statistical tools like Time series, percentage analysis is used.
• Non parametric tests like Chi-square technique was employed to study the relation between the factors

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\text{Chi–square test } (\chi^2) = \sum \frac{(O - E)^2}{E}
\]

Degrees of freedom = \((R-1)(C-1)\)

\(O\) = Observed frequency

\(E\) = Expected frequency

• Analysis of variance was used

• Operation research techniques are used to construct models.

• Flow based algorithm is also used to find shortest route with maximum capacity

1.7 HYPOTHESIS

\(H_0:\) there is no significant difference between respondents family size and supply of milk to the society

\(H_1:\) there is a significant difference between respondents family size and supply of milk to the society

\(H_0:\) there is no significant difference between impact of group leader to respondents and supply of milk to the society

\(H_1:\) there is a significant difference between impact of group leader respondents and supply of milk to the society

\(H_0:\) there is no significant difference between respondents distance of living area and supply of milk to the society

\(H_1:\) there is a significant difference between respondents distance of living area and supply of milk to the society

\(H_0:\) there is no significant difference between respondents Education level and supply of milk to the society
\( \textbf{H}_1: \) there is a significant difference between respondents Education level and supply of milk to the society

\( \textbf{H}_0: \) there is no significant difference between respondents other source of income and supply of milk to the society

\( \textbf{H}_1: \) there is a significant difference between respondents other source of income and supply of milk to the society

\( \textbf{H}_0: \) there is no significant difference between respondents land holding and supply of milk to the society

\( \textbf{H}_1: \) there is a significant difference between respondents land holding and supply of milk to the society

\( \textbf{H}_0: \) there is no significant difference between hill terrain respondents level of satisfaction and normal surface terrain living area respondents

\( \textbf{H}_1: \) there is a significant difference between hill terrain respondents level of satisfaction and normal surface terrain living area respondents

1.8 OPERATIONAL DEFINITIONS

1.8.1 Urban Block

Krishnagiri to hosur right hand side of national high way 7 and surrounded areas are categorized as urban block. This urban block is completely with normal surface area

1.8.2 Rural Block

Krishnagiri to hosur left hand side of national high way 7 and surrounded areas are categorized as rural block. This rural block is on the whole hill terrain with deep forest area
1.8.3 **Marginal Farmers**

This category of milk producers has less than 5 acres of land.

1.8.4 **Small Farmers**

Milk producers who have more than 5 acres but less than 10 acres of land.

1.8.5 **Big Farmers**

Milk producers who have more than 10 acres of land.

1.8.6 **Private Traders**

Private milk traders operate in villages. They buy milk from the producers and supply to consumers. Some private traders have cream separators. Cream separators are used in extracting the cream, from the raw milk. The converted cream is processed into butter and sold.

1.8.7 **Society**

Milk Producers’ Co-operation Societies are referred to as societies (M.P.C.S).

1.8.8 **Union**

All the milk producers’ co-operative societies in Krishnagiri district form a District Level Milk Producers’ Co-Operative Union. This is referred to as Union in the study (K.D.C.M.P.U).
1.8.9 Federation

All the District Level Milk Producers’ Co-Operative Unions are affiliated to state level (Krishnagiri) Milk producers’ Co-operative Federation. It is referred as federation in the study (T.N.C.M.P.U).

1.8.10 Operation Flood

The Department of Agriculture, Government of India has formulated a project for stimulating milk marketing and dairy development, with the help of the World Food Programme (W.F.P). This is known as Operation Flood Programme and the scheme is implemented by the National Dairy Development Board, Anand (Gujarat).

1.8.11 National Dairy Development Board (N.D.D.B)

National Dairy Development Board, Anand, Gujarat is the implementing agency of the scheme operation flood of government of India.

1.8.12 Indian Dairy Corporation

National Dairy Development Board was considered as the implementing agency for the operation flood scheme and Indian Dairy Corporation was the in-charge for financing the schemes. Existence of these two agencies affected the efficient functioning of the programme. Therefore in 1987 I.D.C. was merged with N.D.D.B. Now all the activities are carried out solely by N.D.D.B.

1.10 LIMITATIONS OF THE STUDY

The study is confined to Krishnagiri District of Tamil Nadu with sample respondents of 400 members, 200 from a rural block and another 200 from a urban block.
• Most of the respondents are not maintaining proper records.

• Due to time constrains the researcher covered only two blocks of Krishnagiri district.

• Unable to trace bias of the respondents.

• The study is applicable to the similar ado-climatic features only.

• The study aims mainly on transporting milk with lower cost only.

• The sample consists of marginal, small and big farmers. Landless category was not included due to non-availability of sufficient number of milk producers in the sample.

• Due to the absence of proper records at the farmer level the cost of milk production was not taken into consideration in this study.

1.11 CHAPTERISATION

The present study is organized into seven chapters. The first chapter deals with the introduction, design, and execution of the study.

The second chapter presents the related review of literature both at national and international level.

The third chapter presents a theoretical framework of dairy development activities in India, Tamil Nadu and Krishnagiri district.

The fourth chapter evaluates the performance of the milk supply chain.
The fifth chapter discusses the main factors influencing the milk supplied by the members and truck operators to the society.

The sixth chapter covers the sustainability, performance evaluation of selected sample societies in the study area with transportation route network.

The seventh chapter recapitulates the key findings and gives a comprehensive conclusion of the study. At the end of this chapter, certain policy suggestions have been made for better working and for the maximum utilization of Krishnagiri Milk Producers’ Federation.

1.12 CONCLUSION

The present research work has led the researcher to identify the overall operations of supply chain management in milk industry. The various facts of the study have been presented in this report in appropriate places. In general the study not only reveals about milk depot performance but also provides efficient supply chain management in dairying.