Chapter 1
Introduction

1.0 Introduction

Milk, a complete single food available in nature can serve as the main source of nutrients for all the age groups. Besides, dairying has emerged as a potent means for generating income and employment for the rural population of the country, specially the marginal farmers and landless labourers. Consequent to White Revolution, India has attained self-reliance in milk and milk products through Operation Flood projects. India’s milk production has frog-leaped to 108.5 million metric tonnes per annum in 2008-09 from a mere 17 million tonnes in 1950-51 (Basic Animal Husbandry Statistics, 2006; NDDB, 2010), which made us the world’s largest milk producing country with a share of approximately 15 per cent in world milk production (IDF, 2007b; IDF, 2009). The year wise annual milk production in India for the period of 1950-51 to 2008-09 and the year wise annual world milk production for the period of 1998 to 2009 have been presented in table 1 and table 2, respectively.

The growth observed in the production of milk could be largely attributed to the modernized infrastructure created through the Operation Flood movement. Dairying has acquired an important status in terms of its value of output and contribution to the national economy. From 1999-2000 to 2008-09, while milk production in the world increased by 1.8 per cent, India registered 3.3 per cent compounded annual growth rate in milk production during the same period thereby surpassing the two per cent growth in India’s human population. Over the years, efforts at expanding liquid milk availability, through increased milk production has resulted in per capita availability of liquid milk growing from 112 grams per day in 1968-69 to the level of 258 grams per day in 2008-09 (Basic Animal Husbandry Statistics, 2006, NDDB, 2010). The year wise per capita availability of milk in India has been depicted in chart 1.
Table 1 : Milk Production in India

<table>
<thead>
<tr>
<th>Year</th>
<th>Production in million tonnes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950-51</td>
<td>17.0</td>
</tr>
<tr>
<td>1960-61</td>
<td>20.0</td>
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<tr>
<td>1966-69</td>
<td>21.2</td>
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<tr>
<td>1980-81</td>
<td>31.6</td>
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<td>1990-91</td>
<td>53.9</td>
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<tr>
<td>1997-98</td>
<td>72.1</td>
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<td>1998-99</td>
<td>75.4</td>
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<td>1999-2000</td>
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<td>2000-01</td>
<td>80.6</td>
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<td>2001-02</td>
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<td>92.5</td>
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<td>97.1</td>
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<td>2006-07</td>
<td>100.9</td>
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<tr>
<td>2007-08</td>
<td>104.8</td>
</tr>
<tr>
<td>2008-09</td>
<td>108.5</td>
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</tbody>
</table>

Source: Basic Animal Husbandry Statistics, 2006; NDDB, 2010

Table 2 : World Milk Production

<table>
<thead>
<tr>
<th>Year</th>
<th>Production in million tonnes</th>
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</thead>
<tbody>
<tr>
<td>1998</td>
<td>559.8</td>
</tr>
<tr>
<td>1999</td>
<td>568.4</td>
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<tr>
<td>2000</td>
<td>579.4</td>
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<td>2001</td>
<td>589.6</td>
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<td>2002</td>
<td>604.0</td>
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<td>2003</td>
<td>615.8</td>
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<td>2004</td>
<td>628.4</td>
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<tr>
<td>2005</td>
<td>647.8</td>
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<td>2006</td>
<td>665.2</td>
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<tr>
<td>2007</td>
<td>679.2</td>
</tr>
<tr>
<td>2008*</td>
<td>689.8</td>
</tr>
<tr>
<td>2009*</td>
<td>695.0</td>
</tr>
</tbody>
</table>

* estimated

Source: IDF, 2007b; IDF, 2009
India has a long tradition of keeping milch animals as part of the farming household. In India, milk is mostly produced in small quantities of 2 to 4 liters by some 70 million landless, small and marginal farmers in 500,000 villages (Aneja et al., 2002). Buffalo and cow are the main milch animals in the Indian sub-continent. During 2005-06 of the total milk produced in India, about 45 per cent is retained by milk producing households for self consumption or for conversion into products for immediate consumption. From the remaining 55 per cent of disposable milk, only 18 per cent comes to the organized sector, whereas a whopping 37 per cent is handled by traditional dudhias/halwais (Gupta, 2007). Traditional sector sells milk in loose form and also converts milk into various traditional dairy products such as, paneer, dahi, lassi, makkhan, ghee, khoa, chhana ar_d sweets. The organized dairies generally manufacture various dairy products like milk pcwders, butter, cheese, ice cream, which are originated from western countries, along with liquid milk and ghee. However, during 2005-06, only 5 per cent of India’s total milk production is converted into the western products and liquid milk is consumed to the extent of 50 per cent. Interestingly, almost half of our milk production is actually converted into the above listed traditional dairy products (Gupta, 2007). This milk utilization pattern is presented below as a pie diagram in chart 2, which clearly shows the importance of traditional dairy products sector in the country's economy. These products have widespread use across all
regions in the country. During 2002-03, the market size of ethnic Indian milk products is estimated at over Rs. 1008 billion (Gupta, 2007).

Chart 2: Milk Utilization Pattern (in per cent) in 2005-06

For long time, traditional dairy products remained backbone of traditional milk marketing system in India. These products offer considerable opportunities for the organized dairy industry of the country. The value added to milk through processing, product manufacturing and marketing by Indian *halwais* is nearly two times the price paid to the milk producers, while the western dairy products manufactured by Indian organized sector add about 50 per cent value to milk (Gupta, 2007). However, till now the organized dairy processing sector has hardly made an impact on this sector. The organized milk and milk products processing and marketing sector has left the most profitable segment of milk economy to its largest competition: The non-organized sector thrives on low capital base, generally disregards food standards and cares little for good manufacturing practices.

Among various types, ethnic milk based sweet is one of the most popular type of traditional dairy products. Indian traditional sweets have been developed to preserve the nutritional goodness of milk and to extend its shelf life under high ambient temperatures. In India, milk sweets are an inseparable part of wedding, feasts, festivals, social and religious occasions. Sweets are mainly prepared from two intermediate product base:
khoa and chhana. The traditional dairy products based on khoa and chhana handles about 10 per cent of Indian milk production. These products add 200 per cent value to milk, whereas the western dairy products add only 50 per cent value to milk (Aneja et al., 2002; Gupta, 2007).

Chhana, India's traditional soft, cottage cheese, is a solid product prepared by acid coagulation of hot milk and draining out the whey. According to the Prevention of Food Adulteration Act, 1954 (PFA, 2006) chhana is termed as a product obtained from cow or buffalo milk or a combination thereof by precipitation with sour milk, lactic acid or citric acid. It should contain not more than 70 per cent of moisture, and its milk fat content should not be less than 50 per cent on the dry matter basis. Milk solids may also be used in preparation of this product. Chhana when sold as low fat chhana, it should contain not more than 70 per cent of moisture and not more than 25 per cent fat on dry matter. Such low fat chhana shall be sold in sealed package only and shall bear proper label declaration.

Chhana is used as an ingredient in different kinds of sweets, popularly called as Bengali sweets, which are more remunerative compared to other types of sweets though their shelf life is less than others. Its preparation is mainly confined to the cottage sector, largely in the eastern parts of India centering Kolkata. Regular production of chhana began in Bengal with the arrival of the Portuguese who settled near Hooghly, way back in 1650. They were fond of cottage cheese and passed on the art of making it to the local confectioners who imaginatively used it as a base to expand the range of delectable Bengali sweets by creating rasogolla, sandesh, rasmalai, chamcham, pantua and the like.

India's total production of chhana is estimated at 200,000 tonnes in 2005-06 and the value of chhana-based sweets is around Rs. 80,000 million (Gupta, 2007). The traditional sweets sector of Kolkata, which absorbs majority of the country's total chhana production, has received little attention due to its concentration in the non-organized sector. Only some selective attempts have been made in the past to understand different dimensions of this industry. Vaswani (2002) has reported that the chhana-based sweets
dominated the Kolkata market as compared to other ingredient based sweets such as khoa sweets, concentrated, cultured etc., with 60 per cent market share on volume basis. For chhana based sweets in Kolkata, non-organized sector had a market share of 96.3 per cent based on value.

West Bengal is located at the center of the eastern region of India. The state is strategically positioned with three international frontiers, Bangladesh, Nepal and Bhutan. The state of West Bengal borders the states of Jharkhand, Bihar, Orissa, Sikkim and Assam. West Bengal is the fourth largest state in India in terms of population and among major states, it is the most thickly populated state. Agriculture plays a pivotal role in the State's economy and nearly three out of every four persons is directly or indirectly involved in agriculture. West Bengal is one of the industrially developed states in the country. The index of industrial production (Base 1993-94 =100) of West Bengal has been consistently rising from 132.8 in 2001-02 to 200.8 in 2007-08 (India 2010). The Food Processing Industries & Horticulture Department of the State Government promotes food processing industries in the State. There is an increasing trend towards setting up of food processing industries in West Bengal and in 2006-07, 67 projects with a total investment of Rs. 336.18 crore were implemented in the food processing industries sector (WBIDC, 2009). Although, dairying contributes significantly towards the rural economy of West Bengal, industrialization of this sector is still in its nascent stage. The organized dairying in the state is largely governed by the cooperative sector. Cooperative dairies of the state procure only about 5.4 per cent of the marketable surplus milk of the state, which is far below the national average of the same. A major share of the marketable surplus milk of West Bengal gets converted into chhana, which is totally handled by the unorganized sector.

One hundred twenty years old city of Kolkata is the most important city of eastern region of India and capital of West Bengal. Population wise, Kolkata, only after Mumbai, is second amongst all the Indian cities and urban agglomeration, which makes it a very attractive market. As chhana based sweets are more popular in the eastern states of our country, Kolkata is the most important market for these sweets. So, consumption of
*chhana* is concentrated in the sweetshops of the city of Kolkata. Kolkata has five wholesale *chhana* markets and about 15,000 sweetshops in the city. Due to complete urban status of Kolkata and government regulations prohibiting maintenance of cattle in the city, milk and *chhana* comes from the adjoining districts of Kolkata. Among the adjoining districts, North 24 Parganas is the highest milk producing district of the state and Hooghly has district wise highest milk production density in West Bengal. Due to these reasons, majority of the *chhana* in Kolkata comes from these two districts.

1.1 Rationale of Study

In spite of a great importance of traditional dairy products in our country these products are still produced manually in small scale with variable quality depending on the skill of the *halwais*. There is hardly any quality control and the shelf life of the product is poor. The current methods of manufacture of these products are primitive and based on techniques that essentially remained unchanged over ages. The rural scale operations are associated with inefficient use of energy, poor hygiene and sanitation and non-uniform product quality. Most of the preparations are labour intensive and rely on local inputs. *Halwais* produce and sell these products in urban and semi-urban and rural areas of the country. Very little attention is paid to packaging and sanitary handling practices. Most sales are across the counter and festival season accounts for almost 30-40 per cent annual sales (Patil, 2002).

Indian organized dairy industry in the past showed a very little emotional commitment to traditional dairy products. As a result most of the developments in the dairy industry in India have been directed towards the manufacture of European or Western type dairy products for which equipment and expertise were readily available from industrially developed countries. In the days following independence, there was tremendous scarcity of milk, especially in the metros. So, organized efforts were concentrated in encouraging milk production through marketing of liquid milk, either as fresh milk or with the help of recombining milk powder and butter. Under Operation Flood Programme (OFP) processing facilities were created mainly through adaptation of Western technology with
and without modification for manufacturing of recombined milk, milk powder, butter and ghee. Successful implementation of this programme has made the country largest milk producer in the world.

Currently, Indian dairy industry is undergoing some phenomenal changes to convert ‘increased milk availability’ into ‘better quality products’ and to become a major player in international market. The Indian middle class population is witnessing a revolution in information technology, leading to increased consumer awareness. Due to changes in consumer concerns and perceptions on nutritional quality and safety, increase in disposable income, and availability of new technologies; the demand for new products and processes is increasing. For ages, traditional dairy products have enjoyed an eminent position in the Indian food ethos. The market for traditional dairy products far exceeds that of conventional dairy products like butter, cheese and milk powder. The market for value-added indigenous dairy products is set for a rapid growth. The operating margins of traditional products such as paneer, dahi, lassi, gulabjamun, shrikhand etc. are also much higher than those of western dairy products. However, major strength of traditional dairy products sector is mass appeal of such a wide variety of products. The rapidly growing demand for these products by consumer presents a great opportunity for modernization of this sector. The opportunity provided by increased availability of liquid milk can now be used by modernizing traditional dairy products sector. This will help in tapping potential demand for Indian milk products in both domestic and foreign markets.

In recent past, modernization efforts have been initiated for various traditional dairy products. Some organized dairy factories have started mechanized production of dahi, paneer, khoa and khoa based sweets and these products are now being marketed under various brand names over both the domestic and international markets. However, chhana manufacturing has remained unchanged for long time and marked with small scale of operation, little control over quality and unhygienic handling. The inadequacy of packaging during the production of chhana under the ambient environmental conditions results in product deterioration, particularly in summer months. High microbial contamination results in low shelf life of chhana and poor quality of product made out of
such chhana. In order to overcome inherent disadvantages associated with conventional methods of manufacture of chhana and chhana based sweets such as inefficient use of energy, poor hygiene and sanitation, non uniform product quality, etc. attempts have been made by various research institutes and organizations to develop equipment and process for mechanized manufacture of these products.

High growth rate of chhana based sweets production in Indian market and attractive export potential for catering to Indian population abroad has resulted in increased demand for chhana. Issues like satisfying customers' sweet palate from total quality point of view encompassing healthiness, freshness, purity, durability and economy is gaining ground. Therefore, the demand for quality chhana is also on the rise though the age-old practice of chhana production and transportation is still in vogue. With increase in consumer's perception of quality and freshness in sweetmeat products, more and more large sweetmeat shops are laying increased stress and emphasis on sourcing and/or manufacturing good quality chhana to bring out overall improvement in the quality of sweets. Mechanized production helps in manufacturing uniform quality product with extended shelf life. While manufacturing dairy products in traditional ways, a considerable amount of heat energy goes waste that can possibly be recovered using modern technologies. In recent past, scattered efforts of mechanized production have been initiated by few chhana based sweetmeat manufacturers. So, it is evident that chhana, one of the most important traditional dairy products, is poised for modernization. Application of modern technologies in the production of chhana by organized sector would help in sustaining the overall growth of this segment and in adding more value to the dairy business in general. Better value addition to dairy business would ultimately lead to better livelihood of our millions of farmers. However, till now, none of the big cooperative dairies have entered in the chhana business, mainly due to the lack of information on the interplay between the technical and economic aspects of modernizing the chhana manufacturing. For transforming unorganized chhana business to a modern, organized industry, formulation of proper strategies using scientific management tools is the need of the hour.
The study attempts to explore prospect of modernization of *chhana* production and marketing. Therefore, key features of existing *chhana* industry, including its location, quantum, employment generation etc., have been studied. Due importance has been provided on the indigenous technology employed for production of this traditional product. The economic aspect of *chhana* manufacturing under unorganized sector has also been studied in detail. As *chhana* is a very short shelf life food product, its conventional distribution and marketing system is of great significance for this study. So, efforts have been focused on understanding of the trade practices of *chhana* business. This soft, semi solid milk product forms the base material for a variety of popular sweets. As good quality product can only be prepared from good quality raw material, quality of *chhana* greatly influences quality of sweets. So, the present study has taken into account sweet makers, ultimate users of this produce, to evaluate consumption pattern including trends in demand in terms of quality, variants, shelf life, supply chain etc. Efforts have also been rendered to estimate the market size of *chhana*. Based on this study special emphasis has been put to identify problems of current system of *chhana* manufacturing and marketing. The government through policy changes is instrumental in development of unorganized food sector. The study also looked into how policy framework could affect the *chhana* production and marketing. The production and efficiency of production depends on availability of infrastructure and its quality. The *chhana* manufacturing critically depends on such infrastructure and its quality. The institutional framework, including research institutions play very important role in scientific and sustainable dairy production. Therefore, an attempt has been made to understand institutional R&D framework, related research and availability of technology for modernization of this sector. This has helped in conducting strategic planning for transformation of conventional production system into organized manufacturing. In the end, suggestions and recommendations have been made for modernizing this traditional dairy product sector. In present perspective, study will be very significant since future of dairy industry will depend upon ability to derive maximum value from its potential resources. The study is likely to provide extensive insight into strategic planning for entry of organized players in the *chhana* manufacturing business.
1.2 Objectives of Study

From time immemorial, chhana, a popular traditional dairy product, has enjoyed an eminent position in Indian food ethos. Inspite of large production, chhana manufacturing practices are still old fashioned with their inherent disadvantages. However, emerging consumer demand for food safety and felt need for extended shelf life is making modernization of this segment inevitable. For studying prospect of modernization of chhana manufacturing, following objectives are identified.

I. To understand key features of chhana industry.

II. To study technology and economics of chhana manufacturing.

III. To study distribution and marketing of chhana.

IV. To evaluate chhana consumption pattern.

V. To assess problems encountered in chhana manufacturing and chhana consumption.

VI. To understand the policy environment and institutional R&D framework for modernization of traditional dairy products sector.

VII. To suggest strategic planning for transformation of conventional production system into organized manufacturing.

The study has been conducted in the context of above mentioned objectives.

1.3 Research Methodology

Research methodology spells out the scheme of collection and analysis of data. Details of research methodology adopted for present study is given hereunder :-

1.3.1 Source of Data

Both primary and secondary data were used for the study as described below.
Secondary Data

In the first stage, secondary data regarding traditional dairy products of India, its profile and volume, current practices and problems of manufacturing and marketing of traditional dairy products, and efforts undertaken for modernization of this sector were collected from various sources. Secondary data was also collected to understand the dairying scenario of West Bengal, in general. Various other sources were used to gather secondary information on existing policy environment and institutional research and development infrastructures for modernization of Traditional Dairy Products Sector.

Primary Data

Primary data was collected for studying the chhana manufacturing in West Bengal using semi structured questionnaire. During the study primary data was collected on technology and economics of chhana manufacturing, distribution and marketing of chhana and problems of chhana manufacturing. Primary data regarding chhana consumption pattern and supply chain in Kolkata, market demand trends, estimated market size, in-house chhana production and problems faced by sweet makers were also collected with the help of semi structured questionnaire. A copy of questionnaires is presented in Annexure A and B. Testing of questionnaire was undertaken prior to field visit and based on the feedback questionnaires were improved and finalized. The qualitative and supplementary information on various aspects of chhana and sweet industry of West Bengal was collected by conducting in-depth personal interview with various stake holders and industry experts like office bearers of chhana business associations, district level milk unions, village milk cooperative societies, sweet makers associations etc.

Principal source of primary data is Pashchimbanga Mishtanna Byabsayee Samiti (PMBS), the state level apex association of 1,05,000 sweetshops of West Bengal. From its member list, sample sweetshops of Kolkata and six big sweet houses, namely, K C Das, Balaram Mallik Radharaman Mallik, Haldiram, Bhim Nag, Sen Mahashay and Chittaranjan Das, secretary of Pashchimbanga Mishtanna Byabsayee Samiti (PBMS) and the editor of Mishtikatha, a monthly publication of Pashchimbanga Mishtanna Byabsayee Samiti, are chosen as other primary data sources. Another source of primary data is traders of five wholesale chhana markets of Kolkata, namely, Rajakatra, Baubazar, Chhatubabur bazaar, Natunbazar and Dumdum, who are identified from the list of trader members of respective business associations.

As per the records of milk unions of National Dairy Development Board, Damodar Milk Union and Ichhamati Milk Union are the sole milk union of Hooghly and North 24 Parganas district respectively, which also constitute primary data source. There are two chhana business associations in each of Hooghly and North Parganas, namely, Howrah-
Tarakeshwar Chhana Byabsayee Samiti and Arambag Chhana Byabsayee Samiti in Hooghly, and Machhlandapur Chhana Byabsayee Samiti and Bongaon Chhana Byabsayee Samiti in North 24 Parganas, which are also members of Pashchimbanga Mishtanna Byabsayee Samiti and chosen as source of primary information. Two Dairy Cooperative Societies (DCS) from each district are identified from the DCS list of respective milk unions of Hooghly and North 24 Parganas, Dilalpur Dairy Cooperative Society and Sona Tikri Dairy Cooperative Society in Hooghly, and Charghat Dairy Cooperative Society and Nmitala Dairy Cooperative Society in North 24 Parganas are chosen as primary data source. Chhana manufacturers and vendors of Dhaniakhali, Haripal, Tarakeshwar and Arambag growth centers of Hooghly district and of Swarupnagar, Baduria, Habra and Bongaon growth centers of North 24 Parganas district are identified as source of primary data from the member list of chhana business associations of both the districts.

1.3.2 Selection of Study Areas

Chhana based sweets are popular in the eastern part of India and Kolkata is the biggest market of this part of the country. Kolkata has five wholesale chhana markets and about 15,000 sweetshops in the city. For understanding the chhana consumption pattern, market demand trends both in qualitative and quantitative terms, mechanization, if any, in in-house chhana production by sweet makers, current study covered chhana user market of Kolkata.

Since 1965, when, to overcome milk shortage in Kolkata, West Bengal Government issued the West Bengal Chhanna Sweets Control Order, 1965, restricting the right of persons carrying on business in milk products, the chhana making business shifted out of the city to the hinterland of adjoining districts. As per the industry experts, there are four chhana manufacturing growth centers in each of two adjoining districts, namely, Hooghly and North 24 Parganas districts, which supply the majority of chhana to Kolkata. Moreover, North 24 Parganas is the highest milk producing district of the state and Hooghly has district wise highest milk production density in West Bengal. Thus the
geographical coverage of the study for understanding the manufacturing, distribution and marketing of chhana included the traditional *chhana* growth centers of West Bengal situated in Dhaniakhali, Haripal, Tarakeshwar and Arambag blocks of Hooghly district and in Swarupnagar, Baduria, Habra and Bongaon blocks of North 24 Parganas district.

### 1.3.3 Sample Planning

Primary data was collected for illustrating required information.

Production of *chhana* is centered on various growth centers in both the districts, namely, Dhaniakhali, Haripal, Tarakeshwar and Arambag blocks in Hooghly district and Swarupnagar, Baduria, Habra and Bongaon blocks in North 24 Parganas district. In each growth center of both the districts primary information was collected from *chhana* producers, vendors, village level dairy cooperative society secretaries and office bearers of *chhana* business associations. Besides, the officials of district level milk cooperative unions were also consulted. Sampling unit was individual person. Sampling frame in each district for the purpose of sample planning was gathered from the Pashchimbanga Mishtanna Byabsayee Samiti, the state level apex organization, and its affiliated business associations. Ten thousand five hundred *chhana* producers and five thousand two hundred *chhana* vendors from both the district constituted universe of sample in which seven thousand *chhana* producers and three thousand vendors were from Hooghly district and three thousand five hundred *chhana* producers and two thousand two hundred vendors were from North 24 Parganas district. Stratified random sampling method was used for selecting the sample for collection of primary data. Three per cent of the total universe of *chhana* producers and *chhana* vendors in each district were selected in such a way that they represent all the growth centers of the district in equal proportion. Office bearers of *chhana* business associations were on purposive sample basis. Two office bearers in each district were selected purposively as sample after consultation with the district level cooperative milk union. Officials of district level milk union and office bearers of village level dairy cooperative societies were selected on purposive sample basis in each district.
For studying the chhana consumption in sweetshops of Kolkata, the biggest market of chhana, the city was geographically divided into five segments, namely, North, South, West, East and Central Kolkata. In each geographical stratum, primary information was collected from shopkeepers. There are five chhana markets in Kolkata, namely, Rajakatra, Baubazar, Chhatubabur bazaar, Natunbazar and Dumdum chhana market. Primary information was also collected from the traders of these markets. Besides, the officials of the state level business association and big players of sweet business were also consulted. Sampling unit was individual person. Sampling frame in the city for the purpose of sample planning was gathered from the Pashchimbanga Mishtanna Byabsayee Samiti, the state level apex organization. Around fifteen thousand registered sweetshops of the city constituted universe. Stratified random sampling method was used for selecting the sample for collection of primary data. Three per cent of universe sweetshops in the city were selected in such a way that they represent all the geographical strata in equal proportion. Traders of chhana markets of the city were selected on purposive sample basis. While selecting traders it was ensured that they represent all the chhana markets in equal proportion. The office bearers of chhana business associations were selected on purposive sample basis. The samples of big sweet houses of the city were selected on purposive sample basis after consultation with the state level business association.

1.3.4 Sample Size

In Hooghly district, two hundred and twelve chhana producers and ninety two chhana vendors constituted sample size in which fifty three producers and twenty three vendors were from each of Dhaniakhali, Haripal, Tarakeshwar and Arambag growth centers. In North 24 Parganas district, one hundred and eight chhana producers and sixty eight chhana vendors constituted sample size in which twenty seven producers and seventeen vendors were from each of Swarupnagar, Baduria, Habra and Bongaon growth centers. Sample size differed in two districts due to different size of universe. Office bearers of four chhana business associations, two from each of the two districts, were selected for
sample. Six cooperative dairy personnel, in which, one each from two district level cooperative milk union and two office bearers of village level cooperative societies from each district, constituted the sample.

In Kolkata city, four hundred and fifty shopkeepers of sweetshop constituted sample size in which ninety shopkeepers were from each of North, South, West, East and Central Kolkata. Twenty five traders of five chhana markets of the city constituted sample size in such a way that five traders were from each of the markets. Two office bearers of the state level Pashchimbanga Mishtanna Byabsayee Samiti, the Secretary of the association and the editor of its publication ‘Mishtikatha’ were selected for sample. Six representatives of big sweet houses of the city also constituted the sample.

Semi structured questionnaires and personal interview were used as tools for collection of primary information. There are various tools are available for strategy formulation. In this study, for strategy formulation, three strategic planning tools, namely, five force analysis of environment, PEST analysis and SWOT were employed in this order, as these tools build on one another and when deployed in the above order become very effective in improvement of the quality of the strategic plan that is created in the process.

The hypothesis is generally tested with the help of statistical tools after giving statistical treatment to data and in the end by acceptance or rejection of null hypothesis. In this study, the method employed is to test the hypothesis on the basis of findings which emerge from the analysis of data. This method is also widely accepted in academic circle for research in social sciences.

1.4 Scope of Study

The above objectives were pursued for study, however, scope of the study was restricted due to following:
1. The scope of the study is restricted to chhana only. Therefore, the findings of the study may not be generalized for other traditional dairy products, but certainly can be used for comparison and common issues can be identified with other such products.

2. The scope of the study is restricted to the city of Kolkata and its two adjoining districts, namely, Hooghly and North 24 Parganas, only. Therefore, the findings of the study may not be generalized for other geographical locations, but certainly can be used for comparison and common issues can be identified with other locations.

3. The study aims to cover the status of technology and economics of chhana manufacturing.

4. The study attempts to cover chhana marketing, distribution and consumption pattern.

5. The study covers the period from 2006 to 2009.

Thus the study has its scope as above.

1.5 Limitation of Study

The result of the study was restricted due to following limitations:

1. Time was main constraint for completion of the study.

2. Authenticity of data and methodology used for collection of data were limitations.

3. Due to the unorganized nature of the industry, lack of properly documented and maintained information was a constraint. In absence of official state records, the source of primary information related to unorganized sector of study is based on the members list of relevant business association of sweet shop owners, chhana market traders and chhana vendors.

4. Restriction in geographical coverage area was another limiting factor.

5. Chhana manufacturers flocked together in the district level growth centers are covered in the study. However, scattering of manufacturers in isolated adjoining areas cannot be ruled out.
Thus the limitation of the study facilitates more focused approach to study the objectives.

1.6 Hypothesis

The following hypotheses have been framed for this study.

1. Present technological status of chhana manufacturing results in unhygienic production, energy inefficient process and poor quality product with low shelf life.

2. Conventional unorganized practices of distribution and marketing of chhana adversely affect chhana business.

3. With the existing policy environment and available institutional R&D infrastructures, chhana industry can be modernized as a better business model.

4. New organizational structure can be useful in modernizing chhana manufacturing business.

The above hypotheses are tested during the study with the help of information gathered for the study.

1.7 Chapter Scheme

The present study has been presented in eight chapters. Chapter one is introductory part that gives glimpses of dairying of India and place of traditional dairy products in Indian dairying. This chapter explores rationale for conducting the present study. Besides, this chapter also sets framework of conducting the study by setting objectives, scope, limitations and research methodology. Second chapter deals with the review of literature which inter alia contains review of available articles, research papers and books on theme similar to the title of the study. Review of literature was further divided into four groups for wider coverage of subject matter. Third chapter deals with place of traditional products in Indian dairying, techno-economic profile of traditional dairy products of
India, the practices and problems of production and marketing of these products and efforts towards modernization of this sector. Chapter four highlights the dairy scenario of West Bengal in general and the key features of chhana industry of West Bengal in specific. Chapter five delineates detailed analysis of chhana manufacturing and marketing in two adjoining districts of Kolkata with respect to objectives set for the study. Similarly, chapter six outlines the analytical study of chhana consumption in Kolkata. Chapter Seven takes account of the existing policy environment and available R&D infrastructure for modernization of traditional dairy products sector and presents the detailed analytical study for strategy formulation for modernization of chhana industry. Recommendations and suggestions for future research emerging out of present study and conclusion are given in last chapter.