

**PROFITABILITY ANALYSIS AND ENTREPRENEURSHIP  
OPPORTUNITIES ON DAIRY MILK PRODUCTION: BASED ON  
SELECTED AREAS IN DINAJPUR DISTRICT, BANGLADESH**

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SELECTED AREAS IN DINAJPUR DISTRICT, BANGLADESH**

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## CERTIFICATE

This is to certify that the thesis entitled “**PROFITABILITY ANALYSIS AND ENTREPRENEURSHIP OPPORTUNITIES ON DAIRY MILK PRODUCTION: BASED ON SELECTED AREAS IN DINAJPUR DISTRICT, BANGLADESH**” submitted to the Department of Agribusiness & Marketing, Faculty of Agribusiness Management, Sher-e-Bangla Agricultural University, Sher-e-Bangla Nagar, Dhaka in partial fulfilment of the requirements for the degree of **Master of Science (MS)** in Agribusiness & Marketing, embodies the result of a piece of bona fide research work carried out by **Nripoti Roy, Registration No. 12-05188** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

I further certify that any help or source of information, as has been availed of during the course of this investigation has been duly acknowledged by the author.

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**DEDICATED  
TO  
MY BELOVED  
PARENTS**

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**The Researcher**

## **ABSTRACT**

The present study was designed to analyze the profitability and entrepreneurship opportunities on dairy milk production in selected areas of 15 villages of Dinajpur region. The study was revealed the socio-economic characteristics of dairy farmers, profitability and correlation coefficient of milk production, supply chain and entrepreneurship opportunities of dairy farm. Primary data were collected from 40 farmers. A random sampling was followed. Tabular, graphical and statistical analysis were applied in this thesis. The main findings of the study reveal that dairy milk production is a profitable enterprise. Costs, returns, profitability, supply chain, entrepreneurship opportunities were depicted separately. Total cost of production was Tk. 217.62 per cow per day. Gross return was Tk. 567 per cow per day and Net return was 318.27 per cow per day. Average production of milk was found 9.5 liters. Human labor cost was Tk. 23.15. The estimated Benefit Cost Ratio (BCR) was 2.28 which implies that one taka investment in dairy milk production would result in Tk. 2.28 The multiple regression coefficients function was used for factor affecting the profitability of dairy milk production. The profit was used for independent variable. Family member, education, training, age, experience, number of cow of the respondents were used for dependent variables. Water problem, electricity problem, high feed cost, lack of quality breeds, lack of quality food, lack of Medical facilities, problems of transportations, lack of storage capacity, were major problems faced by the dairy farmers. The supply chain of the milk production were farm to direct customers, farm to retailers to customers, to milk processors to customers. Necessary actions were also expected by farmers and other market actors from Govt. NGOs and other private institutions to reduce the barriers faced by in case of marketing raw milk and dairy milk products. So, that they could get benefit from maximum productivity. Finally, some recommendation were provided for policy formulation and execution.

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## **ABBREVIATIONS AND ACRONYMS**

BARC	Bangladesh Agricultural Research Council
BBS	Bangladesh Bureau of Statistics
BOS	Bangladesh Orthonoitik Samikkha
BCR	Benefit Cost Ratio
DLS	Directorate of Livestock Services
<i>Et al</i>	et alia (and others)
etc.	et cetera (and others and so forth)
FP	Net Price Received by Farmer
GOB	Government of Bangladesh
GNP	Gross National Product
GDP	Gross Domestic Product
HSC	Higher Secondary Certificate
Kg.	Kilogram
L.	Liter
MFC	Marginal Factor Cost
MoF	Ministry of Finance
M.S.	Masters of Science
MVP	Marginal Variable Cost
ME	Market Efficiency
No.	Number
Ha	Hectare
OLS	Ordinary Least Squares
%	Percentage
SSC	Secondary School Certificate
SPSS	Statistical Package for Social Sciences
Tk.	Taka
TFC	Total Fixed Cost
TVC	Total Variable Cost
AC	Average Cost
AP	Average Price

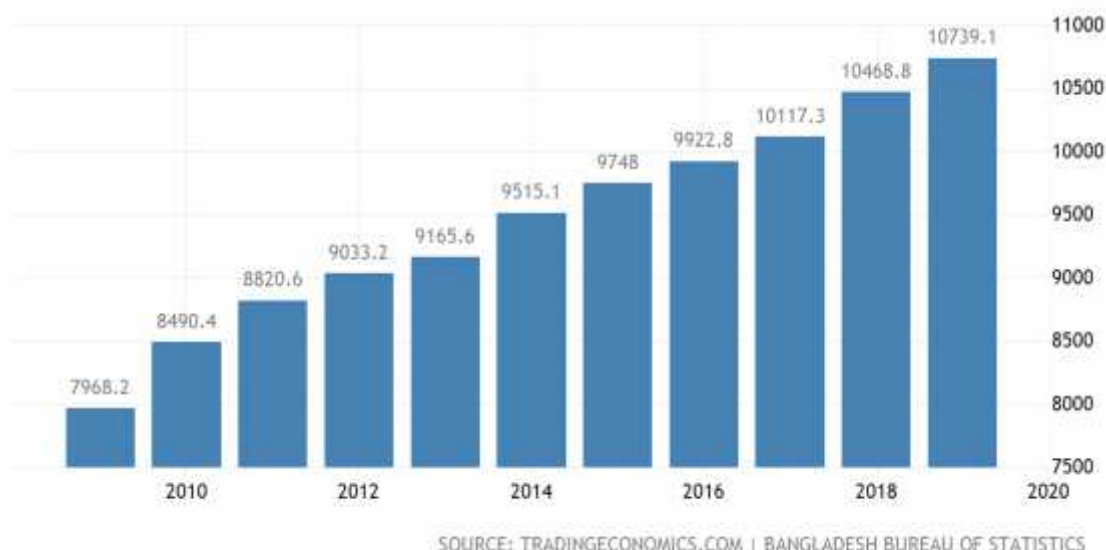
# CHAPTER-1

## INTRODUCTION

### 1.1 Background

Bangladesh ranks eighth in the world with a population of over 160 million encompassing an area of 1,47,570 sq. km. It also an agricultural country of which livestock sector is the prominent sector. Agriculture is the single largest producing sector of the economy and it contributes about 13.60% to GDP and employs around 40.60% of the total labor force (GOB,2019). Agricultural sector is dominated by crop production, forestry, and livestock. The grater agricultural sector also include fisheries subsector that contributes 3.61% to the national GDP and 25.30% to the agricultural GDP (DLS,2019). Agriculture sector provides the basis for the non-agricultural sector, especially for industrial sector. Food security, employment opportunity and reduction in rural poverty are also influenced by the expansion of agricultural sector. Agricultural sector provides raw materials for industry and create efficient demand for industrial goods. Again, it plays a vital role in the growth and stability of her economy as is indicated by its major share to Gross Domestic Product (GDP), employment generation and export earnings. Agriculture sector is also a major source of foreign exchange earnings, as it produced raw and agricultural products for exports. It has great importance due to its inter-linkages with the rest of the economy.

GDP from agriculture in Bangladesh increased to 10739.1 BDT Million in 2019 from 10468.8 BDT Million in 2016 GDP from agriculture in Bangladesh averaged 9453.54 BDT Million from 2009-2019, reaching an all-time high of 10739.1 BDT Million in 2019 and a record of low 7968.2 BDT Million in 2009 Figure 1.1 shows



**Figure 1.1.1: The graphical view of GDP from Agriculture**

The contribution of GDP from agriculture in national GDP is decreasing day by day though the production of agricultural sector is increasing day by day. In 1985-86 the contribution of GDP from agricultural sector was 31.15 and now 2018-19 the contribution of GDP from agricultural sector is 13.6. It shows the decreasing rate of contribution of GDP from agricultural sector into national economy.

**Table 1.2.1 The Contribution of GDP from Agriculture**

Year	1985-86	1990-91	1995-96	2000-01	2005-06	2010-11	2014-15	2015-16	2016-17	2017-18	2018-19
GDP %	31.15	29.23	25.68	25.03	19.01	18.01	16	15.35	14.74	14.23	13.6

Source: BOS (2019)

Dairy sector of Bangladesh is playing an importance role in our agricultural and national economy. Livestock is an integral component of the complex farming system in Bangladesh as it not only a source of meat protein but also a major source of farm power services as well as employment. The livestock and dairy sector contributed 1.53% to the national GDP and 13.46% to the agricultural GDP (DLS,2019). This country is producing milk well under the requirement and most of the demand is being met from import of dry milk from the international market. It is long overdue to revitalize this sector with appropriate technology to meet both local milk and milk demand.

According to the estimate of the Department of Livestock Services (DLS), the population of total livestock was 528.36 lakh in 2011-12 and 554.02 lakh in 2018-19. The number of cow included the total livestock population was 231.95 lakh in 2011-12 and 241.87 lakh in 2018-19. It shows the growth rate of total livestock population is not a satisfactory rate.

**Table 1.2.2 Number of cow and total livestock population in Bangladesh. (Number in Lakh)**

<b>Animal</b>	<b>2011-12</b>	<b>2012-13</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
<b>Cow</b>	231.95	233.41	234.88	236.36	237.85	239.35	240.86	241.87
<b>Total livestock</b>	528.36	532.11	535.90	539.72	543.57	547.45	551.39	554.02

Source: DLS (2019)

The production of animal protein like milk and meat (Beef, Mutton, Chicken) have been increasing over the past several years. As a result, per capita availability of animal protein is increasing. The production statistics of milk, meat, and eggs during the period from FY2011-12 to FY2018-19 are summarized in the Table 1.3

**Table 1.2.3 Milk and meat production in Bangladesh. (Lakh Metric Tons)**

<b>Fiscal Year</b>	<b>2011-12</b>	<b>2012-13</b>	<b>2013-14</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>
<b>Milk (Lakh MT)</b>	34.63	50.67	60.90	69.69	72.75	92.83	94.06	70.16
<b>Meat (Lakh MT)</b>	23.32	36.20	45.20	58.62	61.25	71.54	72.60	62.78

Source: DLS (2019)

### **1.2 Nutritional value of milk**

Milk is the first food for humans, and it seen as the only richest natural food in terms of the nutritional elements of the body needs. Similarly, it provides many of the nutritional elements for the growth and maintenance of the human body, in adequate amounts. The fact that every country in the world has a dairy development strategy/policy and engages in milk production demonstrating the importance of milk in balanced nutrition.



**Table 1.2.4 Nutritional value of milk (In every 244 gm or 1 cup)**

<b>Items</b>	<b>Quantity</b>
Calories	150 gm.
Protein	8 gm.
Fat	8 gm.
Saturated fat	5.1 gm.
Carbohydrates	11 gm.
Calcium	291 mg.
Iron	0.1 mg.
Sodium	120 mg.
Vitamin A	310 µg.
Ascorbic Acid	2 mg.

**Source:** World Almanac (1999).

### **1.3 Importance of dairy farming of Bangladesh**

It is well known that milk is an ideal food for humans, particularly to sustain growth in children, fetal growth in pregnant women, and milk production during lactation period. It has also been described as nature's most perfect food. For the newly born infant or animals, mother's milk is a complete and well balanced food. It is very important for human health which includes various nutrients, such as vitamins, minerals and organic compound. These supply energy and building materials of human body (Akter, 2014).

In low-income country dominated by agriculture, growth in a large domestic market is only possible if incomes are rising in the agricultural sector. Animal production is one, and very important, facet of agriculture. Dairying is a good source of income to the small and marginal farmers. Dairy animals, comprising cows and buffaloes, are the major livestock and hold a very important place in the national economy of Bangladesh. Apart from their role in milk production they contribute a huge quantity of organic manure, which is one of the major inputs in Bangladesh agriculture. It is also used in bio-gas production. Part of dried cow dung is being used as fuel for cooking purpose in rural area. Dairying is a subsidiary occupation of almost all farmers in Bangladesh.

Bangladesh is internationally well placed to produce milk due to availability of cheap labor cost. Bangladeshi farmers can gain higher profit through improved breeds, feeding,

health care and management (Alam, 1995). In some districts especially Dinajpur district small and large scale dairy farms have been increasing day by day. Some important issue like management practice, relative productivity, value addition activities, profitability, and resource use efficiency of small-scale dairy contract and non-contract farming are essential for higher profitable dairy business.

#### 1.4 Contribution of livestock sector

Bangladesh is an agro based country and about 40.60% of total labor forces are engaged in this sector (BOS,2019). The contribution of total livestock to GDP is 1.47 percent of total, which is 14.54% of agricultural GDP. It constitutes an important part of our national economy. The crop sector in agriculture has largely been dependent on livestock. In addition to draft power and leather, livestock provides manures, meat and milk to the vast majority of people. The dairy cow play a significant role in maintaining a strong agricultural economy of Bangladesh. Table 1.5 shows the contribution of agriculture and sub-sectors of GDP of Bangladesh.

**Table 1.2.5: The contribution of agriculture and its sub-sectors in GDP (Base years 2005-06)**

Sector/ Sub-sector	a) Crop	b) Livestock	c) Forestry	Agriculture
2010-11	10.50	1.98	1.79	14.27 %
2011-12	10.01	1.90	1.78	13.70 %
2012-13	9.49	1.84	1.76	13.09 %
2013-14	9.28	1.78	1.74	12.81 %
2014-15	8.87	1.73	1.72	12.32 %
2015-16	8.35	1.66	1.69	11.70 %
2016-17	7.86	1.60	1.66	11.12 %
2017-18	7.51	1.53	1.62	10.67 %
2018-19	7.05	1.47	1.58	10.11 %

Source: BOS (2019)

#### 1.5 Prospects of dairy sector in Bangladesh

In agricultural economy, production management, employment of huge people, poverty reduction and animal protein supply, livestock sector plays very crucial role. But expected development of this sector is not occurred because government did not give appropriate priority to this sector. Now the production of this sector among the total production of the country is only 1.47% Contribution of this sector in the total production of the country decreasing day after day which is not expected because the

foods produced by this sector has a great demand in this country and this industry has a lot of prospect.

Dairy farming is a potential pathway out of poverty for millions of Bangladeshi. Among the animal products, milk contains a high nutritional value. It contains all ingredients required by the human body in proper proportions and in a very easily digestible. Also the inclusion of milk in the diet increases the digestibility of other types of food which are included in diet. The demand for milk and milk products is increasing because of the rapid increase of population, the spread of education and growing nutrition awareness. In fact, in most of the cities milk supply at present is short of requirements. For these reasons, dairy development has assumed a position of paramount importance in the rural economy of Bangladesh. It is essential that this sector, like every other sector of tropical agriculture, should be modernized and made more productive as quickly as possible.

Bangladesh is approaching a population inflection point as the numbers are projected to rise sharply by over 300 million between 2000 and 2030 which is more than twice the population increment (World Bank, 2005). Currently there is a huge deficit in the availability of milk. Recent total demand for milk is 152.02 Lakh Metric Ton and total production is 99.23 Lakh Metric Ton Production deficiency of milk is 52.79 Lakh Metric Ton A huge investment opportunity present in this sector.

**Table 1.2.6: Availability, Demand, Production and Deficiency of milk**

<b>Products</b>	<b>Availability</b>	<b>Demand</b>	<b>Production</b>	<b>Deficiency</b>
Milk	165.07 (ml/day/head)	152.02 lakh Metric Ton (250 ml/day/head)	99.23 lakh Metric Ton	52.79 Lakh Metric Ton

**Source:** DLS (2019)

### **1.6 Justification of the study**

The present study concern itself mainly to investigate the profitability level and entrepreneurship opportunities of dairy farming in Dinajpur district. Now a days a remarkable number of dairy farms have been established in this area. As a result, it will increase the local milk production and employment. It may also offer the scope of earning extra income of farmers. Most of the food supplying authority believe that livestock production will retain its importance in future. Dairy farming should receive an attention in order to capture huge amount of foreign currency for the increasing

population of Bangladesh. The dairy sector was a neglected field. Without any endeavor to develop it the achievement of the goal food security, which is the first and basic necessities of livelihood will be difficult. Huge scope of improvement in production and marketing in milk and dairy products present in the study area. The present study was conducted in 15 villages in Dinajpur sadar upazila. This study provides appropriate suggestion and policy recommendations which might help the development agencies and policy makers of the country for improving the livelihood of dairy farmers.

### **1.7 Objectives of the study**

The specific objectives of the present study are as follows-

1. To determine the socio-economic characteristics of dairy farmers in Dinajpur district.
2. To calculate the profitability of dairy farming in the study area.
3. To analyze the correlation coefficient that significantly influences profitability of dairy milk production in the study area.
4. To determine the supply chain and entrepreneurship opportunities of dairy milk production in the study area.
5. To identify the problems and recommend policy reform options to improve dairy farming.

### **1.8 Limitation of the study**

Some limitations were faced during conducting the study. These are:

1. The study is confined to only Dinajpur district based on limited data. The required data for the study were collected through a simple face to face interview following a sample survey method in which 45 percent dairy farm owners did not let the researcher examine their record books. In such case the researcher had to depend on their verbal information regarding several questions.
2. There was also shortage of time and resource, for these reason it was not possible to consider a large number of sample for the present study.
3. Milk producers and traders had records in many cases but they were reluctant to show the records (Monthly income, volume of business, store rent) due to fear of implication of income tax.

## **1.9 Organization of the thesis**

This thesis contains a total of ten chapters which have been organized in the following sequence. Chapter 1 includes introduction. The review of literature is presented Chapter 2. Methodology of the relevant study is discussed in Chapter 3. Chapter 4 includes the socio-demographic profile of dairy farmers. Chapter 5 deals with profitability analysis of milk production. Chapter 6 describes the correlation coefficient that significantly influences the profitability of milk production. Chapter 7 presents the supply chain and entrepreneurship opportunities of milk production. Chapter 8 presents constraints and problems related to dairy farming. Chapter 9 represents the summary, conclusion and recommendations to increase milk production. Chapter 10 and 11 represents references and appendices respectively.

## **CHAPTER-2**

### **REVIEW OF LITARATURE**

Literature on the profitability and entrepreneurship opportunities of dairy milk is considerably inadequate particularly in Bangladesh, because very little research has been done on these sector. The objectives of this chapter is to provide a brief overview of the results of the previous studies related to the present research work. However some relevant studies in respect of production and marketing efficiency, entrepreneurship opportunities of dairy milk are available from Bangladesh as well as other countries. This chapter is concerned with the review of literature related to production and marketing, entrepreneurship opportunities of dairy milk.

*Alamet al.* (1995) evaluate the economics of mini dairy farming in some selected areas of Bangladesh. The result shoes that the production of milk per cross-bred cows was higher (5.66 liters) than that of local breeds (2.23 liters). Highest (5.74 liters) milk yield per cross-bred cow was recorded in large farms. The average lactation period of cross-bred cows was higher (304 days) than the local cows (210 days). In production cost of farms concentrates took the highest share (35.19%) followed by labor charges (23.64%). It also indicated that mini dairy farm is more economically profitable than large one. The small farms employed more female family labors while large farms depends more on hired labors. The expansion of dairy farming with cross-bred cows was suggested for accelerating income and employment opportunities in rural Bangladesh.

Saadullah (2000) conducted an economic analysis on dairy cow rearing and found that dairy farming is a profitable enterprise. The study showed that feed cost is the largest single cost item of raising dairy cow. In local breed and cross bred, feed constitute 60.01 and 67.57 percent of total cost, respectively. In local breed and cross-bred net returns per day per cow were Tk. 16.43 and 82.01, respectively. Benefit cost ratio of local breed and cross bred were 1.38 and 1.90, respectively. Cobb-Douglas production function was used to estimate contribution of the variables in getting higher return by the farmers. The major constraints to dairy cattle production are the shortages of quality feeds and fodder and breeds. Finally, it can be concluded that smallholder dairy production was found to be an important and have the potential to poverty alleviation,

food security, improved family nutrition and income and unpredictable milk market, high prices of drugs, feed concentrates and failure of AI were main constraints limiting small-scale production in the study area.

Mondal *et al.* (2010) conducted a comparative economic analysis of local breed and cross breed milk cow in a selected area of Bangladesh. The result showed that per day total costs of rearing per local and cross breed cow were Tk.32.85 and Tk.71.23, respectively. Feed cost constituted about 58 percent of total cost for local breed cows while it was 62 percent for cross breed cows. Paddy cost occupied the largest share out of total feed cost in local breed cows. The average milk yield per day per cow was 1.89 liters and 7.68 liters for local breed and cross bred dairy cows, respectively while the total return per day per cow was estimated at Tk.58.27 and Tk.224.76 for the same and the net returns per day per cow were Tk.25.42 and Tk.153.53. The study revealed that green grass, concentrate feed, labor cost and capital cost have significantly positive impact on milk yield for cross breed cows but all the inputs other than labor cost and capital cost have positive impact on milk yield for local breed cows. It was also observed that the resources were not efficiently used by both local breed and cross-bred farms. However, it was found from the study that profitability of cross bred cows was higher than that of the local breed cows. The study identified some major problems and constraints as reported by farmers which included lack of grazing land, lack of veterinary care and services, high price and scarcity of feed and fodder, low price of milk, etc.

Akter (2014) carried out a value chain analysis of dairy milk production and marketing, a farm level study in Dhaka district. This paper showed result of the analysis that the total cost per day per cow was estimated at Tk. 378.89 and net return was calculated Tk. 30.86 for a dairy farm. The value addition for per liter of milk produced in dairy farmers, Faria, Bepari, Sweetmeat shopper was calculated at Tk. 28.06, Tk. 1.63, Tk. 2.53 and Tk. 40.01. The benefit cost ratio of dairy farming was 1.80. Cobb-Douglas production function was used to estimate the contribution of key variables of production of dairy milk. The study also identified problems faced by dairy farmers such as lack of credit, high labor cost, disease problem and inadequate veterinary care, lack of sufficient electricity facilities, expensive feed supply, lack of technical knowledge, shortage of capital, low quality feed, high packaging cost, lack of green

grass, preservation problem and lack of milk processing center. Finally there are some recommendation were made for policy implementation.

Pathan (2011) carried out a research on an economic analysis of smallholder dairy farming in some selected areas of Bhaluka Upazila in Mymensingh District. To identify the most important variables in the production process Cob-Douglas production function model was used. The study resulted that dairy cow rearing was profitable. Total cost of rearing a dairy cow per day was estimated at taka 71. The total return per day was estimated at 139 for a dairy cow. The value of milk production represented 82.04% of total return. The respective net return was Tk. 68 per day for a dairy cow. The average milk yield per day was 2 liter. The study identified some decisive problems such as scarcity of feed and fodder, lack of improved breed, lack of veterinary care and service, lack of institutional credit and high price of concentrate feed.

Shamsuddoha *et al.* (2000) conducted on problems and prospects of dairy industry in Bangladesh. This research paper shows that although dairying is the most ancient occupation established in the rural setting of Bangladesh, its development is unsatisfactory due to several problems. The main problems include breeding, feeding, management, diseases and marketing. The dairy sector has also not received adequate policy support in respect of information generation and research. The demand for milk is growing at a faster rate than supply because of the rapid increase in population, creating a widening imbalance between demand and supply. There is a need to have knowledge of the existing demand, its growth over time, and the existing supply possibilities. There are also many types of information needed for proper functioning of markets. In the light of such knowledge it would be necessary to take policy measures for providing strong institutional support to increase domestic production and reduce the imbalance between supply and demand. This research paper also shows lack of research and extension service, it has not yet been demonstrated that dairy farming can be transformed into an attractive and profitable business.

Alam (2016) Performed a research on productivity and supply chain analysis of dairy milk production based on some selected areas in Dhaka district of Bangladesh. Economic profitability is a critical criterion to make any investment decision at dairy farm. It can be measured based on net return, gross margin and ratio of return to total cost. The total variable cost of dairy milk production was 89.98 percent of the total



cost. The average yield of dairy milk per cow per day was 12.5 liters and average price of milk was Tk. 79 per liter. Cobb-Douglas production function was used to estimate contribution of the variables in getting higher return by the farmers. Benefit Cost Ratio (BCR) was found to be 2.17 which implies that one taka investment in dairy milk production would generate 2.17. There are some problems faced by dairy farmers in dairy milk production like social and cultural, financial and technical. Besides these there are also identified problems faced by dairy farmers such as high labor cost, Disease problem and inadequate veterinary care, Lack of sufficient electricity facilities, Transportation problem, Expensive feed supply, Lack of technical knowledge, Shortage of capital, Low quality feed, High packaging cost, Unstable price, Excessive rainfall and political unrest. On the basis of the result of this study dairy farming was considered a profitable enterprise for investment decision and it can provide huge income generating, employment opportunities and nutritional stability to the rural and urban people of Bangladesh.

Jabbar (2009) Conducted a research on Policy Barriers for Dairy Value Chain Development in Bangladesh with a focus on the North West Region. It expressed that in the traditional or even processor driven supply chains, actors including producers exchange goods and services, so there is a flow of goods and services. In most cases transactions for inputs may involve a different set of actors and chains than transactions for products. And while different actors perform different functions and there are informal rules and norms governing these transactions and relationships, there is no integrated system of governance that legally binds all actors giving each specific rights and obligations. It also focused on a supply chain each actor tries to maximize its returns at the expense of the other(s) while in a value chain framework; there are agreed principles for sharing of benefits from improvement in chain functions and performance.

Khan *et al.* (2000) Carried out a research reproductive and economic performance of dairy cattle in Bangladesh. The dairy cattle improvement program in Bangladesh aims to improve local cattle for milk production by incorporation of both tropical breeds (Sahiwal and Red-Sindhi,) and temperate breeds (Holstein- Friesian and Jersey). The CCBS controls overall breeding programs throughout the country, except for the Cooperative Dairy Production System. The productive and reproductive performances of different crossbreds have been studied by several researchers and they showed that

the Holstein-Friesian crossbred performed better than others. An economic evaluation of dairy cattle in Bangladesh showed that the purebred and crossbred of temperate breeds had higher profit than other crosses but their survivability is lower than tropical breeds.

Rahman (2009) Conducted on an economic analysis of dairy cow rearing under Rangpur dairy. The study found that the rearing cost per day of local and crossbred cow were 43.59, 90.97 respectively. The average milk yield per day per cow was 1.46 liters and 4.59 liters for local bred and cross-bred respectively while the total return per day was estimated at 60.02 and 172.98 for the same. The value of milk reproduction represented 70.52 and 77.02 percent of total returns for local breed and crossbred farms, respectively while the net return per day per cow was 16.43 and 82.01. BCR per day per cow was Tk. 1.38 and Tk. 1.90 for local bred and crossbred cow rearing respectively. The study also revealed that green grass, concentrated feed, labor cost have significant positive impact on milk yield for local breed cows and all the inputs other than labor cost have positive impact on milk yield for crossbred cows. The study also indicated that the profitability of crossbred cow was higher than that of the local breed cows. Cob-Douglas production function model was used here to determine the effect of key variables.

Begum *et al.* (2017) Studied on milk production performances of cross-bred cattle at the villages of Jamalpur District in Bangladesh. This research paper shows that BL, CG and WH increased with increased of the age of cross-bred cattle up to 150 months. Similarly, CFDC and GGU increased with the increased of the age of cross-bred cattle up to 150 months. Farmers in the study area were not interested to keep breeding bulls for breeding purpose but they were using artificial insemination system to insemination their cows and aware about production performance record of the insemination bull. Farmers took health services from milk vita and sold milk to the same. They believed that dairy cattle rearing is a profitable livelihood. TM, PM and LP increased with the increased of the age of cross-bred cattle up to 150 months. However, increased of CFDC will increased TM, LP and PM but increase of GGU will increased only LP. On the other hand increase of CG will increase TM and increase of BL will increase LP and PM.

Khan *et al.* (2010) Conducted a research on management and production system of small scale dairy farm in a selective rural area of Bangladesh. It was that the highest milk production from crossbred and indigenous cows were 10.4 and 2.40 liters/day, respectively, and lowest milk production from crossbred and indigenous cows were 2.29 and 0.72 liters/day, respectively. Milk yield per lactation for crossbred and indigenous were 1210 and 358 liters, respectively. The average lactation period for crossbred and indigenous cows was 283 and 207 days. In this study cost items consisted of feeds, labor, housing, veterinary services, AI and costs of capital that is interest on fixed and operating capital. In the process of raising dairy cows, farmers often concomitantly require to keep calf and heifer in their farm. It is noted that average daily total cost of raising per dairy cow was taka 67.51 in the study area. The purchased feeds were valued according to the average prices actually paid for the items. It is evident that feed cost was the most important component that represents 58.72 per cent of total cost. However, it can be noted that on an average labor cost per cow per day amount Tk. 10.00. In the study area the farmers used half building and tin shed houses for dairy animals. It was found that on an average housing cost per day per cow was Tk. 2.85. The operating capital was calculated on the average variable cost such as feed cost, hired labor cost and veterinary cost. Benefit Cost Ratio of dairy enterprises, which is on an average 1.26. Most of the farmers (70%) said that dairy farming was profitable, 20% said less profitable and 10% said balance. Most of the farmers believe that dairy farming is a profitable enterprise and can be more profitable if government gives support on feed cost, marketing, loan and management training.

Rashid *et al.* (2015) The study was undertaken to examine the profitability and resource use efficiency of dairy farming under traditional and commercial management at rural households and farms. For obtaining information from farmers two milk producing districts namely Sirajgonj and Gazipur were selected purposively for this study is observed that the traditional dairy farmers in the rural areas of Bangladesh are the major supplies of milk for the rural and urban consumers. But the demand for milk is partially fulfilled by commercial farm. Although the production of milk under commercial management is considered to be profitable business, the production under traditional system is not very remunerative. The dairy production in rural areas has excellent opportunities to improve family income and employment generation through efficient use of inputs, and use of more productive technologies. The farmers failed to

use inputs efficiently in the production of milk. The estimated returns to scale and elasticity of production parameters also reconfirmed that the use of production inputs was at partial optimal level. Benefit cost ratio is a relative measure, which is used to compare benefits per unit of cost. It helps to analyze the financial efficiency of the farms. The BCR = 1.34 indicates that, by investing one taka, the return would amount to Tk.1.34. The benefit cost ratios of commercial dairy farming were more than 1 indicates the existence of potential for dairy activity. It is also observed that commercial dairy farmers were more efficient than traditional farmers as they were trained and better knowledge about dairy farming. For higher production and profitability commercial dairy farming might be encouraged by government, NGOs and private entrepreneurs by providing improved technologies, credit facilities, subsidy on improved high yielding cows and extension services.

Amin (2000) Conducted on the marketing of milk in selected northern districts of Bangladesh. He found in his study that the productivity of dairy cow of the selected farms was 5.28 and 4.84 liter per day in Rangpur and Bogra, respectively. Marketed surplus for milk in Rangpur was higher (Tk. 96.97) than that of Bogra (Tk.96.087). Small farm in Rangpur got highest profit (Tk.1.34/liter) when they sold milk to retailers. They got lowest profit (Tk. 0.12/liter) from the sweetmeat shop owners. At Bogra small farms earned the highest profit (Tk. 2.13/liter) when they sold packaged milk through their own sale centers. Medium farms earned a profit equivalent to Tk. 3.41 and Tk. 1.81 per liter from the sale centers and home service channels at Rangpur and Bagura, respectively. Large farms in both areas carried the highest profit (Tk. 3.47 and Tk. 3.07/liter) by selling through sale centers. All selected farms got lowest profit from sweetmeat shops. In Rangpur average margin to the retailers was higher (Tk. 1.33/liter) than that in Bogra (TK. 88/liter). At the two study areas milk traders got lowest margins from sweetmeat shops owners. The most efficient channel was MC1 (dairy farm- consumer at farm gate and for Bogra, dairy farm- urban consumer at home service) at both areas.

Islam (2016) The research paper revealed that majority of the population was dependent on agricultural activities and business, and although cross-bred cattle were more milk producer but majority of the household did not rear those. Farmers were not knowledgeable about modern health management of the cattle and they also were not interested to cultivate grasses which are the staple feed for their cattle. Natural mating

system was the main way of insemination at rural villages of the studied area. Opinions of farmers were very much positive towards cattle rearing. Immediate steps like feed cost reduction, health worker increase and raw milk price increase were major challenges to continue and increase dairy and beef cattle production.

Akter (2009) studied the value chain of dairy sector in Rangpur district. Total cost per day per cow was estimated at Tk.108.66 and Tk. 106.06 and net returns were calculated Tk. 93.62 and Tk.76.18 for independent and contract farm, respectively. The value addition of per liter of milk by milk producers, traders, processors, retailers was calculated at Tk. 14.39, Tk. 13.00, Tk. 24.00 and Tk. 4.33, respectively. The net margins obtained per liter of milk were Tk. 12.21, Tk. 7.86, Tk. 17.50, and Tk. 3.99 for milk producers, traders, processors and retailers, respectively. Expensive, inadequate and low quality feed, lack of grazing land, green grass, adequate capital, knowledge about cost effective feed production and extension services, high fees of veterinary doctor, irregular supply and high price of veterinary medicine and low price of milk were the major problems of milk producers. The study also identified some major problems of other value chain actors and probable solutions of the problems.

Sikdar (2009) Carried out an economics of community dairy farming in Satkhira district in Bangladesh. Conducted from the study that, dairy farming is a profitable enterprise. After the services of Field Fertility Clinic, total milk production, total return and net return per farm have been increased this indicated the positive impact for dairy development in the study area. FFC intervention is found to be a positive effect on total return from the milk production. If proper steps could be taken, dairy farming could be a more viable commercial enterprise which is turn could play a vital role to overcome the problems of low income, unemployment, under nutrition and unfavorable balance of payment situation of the country. The policy maker should, therefore, extend more policy supports, which will encourage expansion of dairy farming and thereby, will contribute to increase of milk production in the area and in the country as a whole.

Jabbar *et al.* (1997) Conducted a field study to determine cost and returns of dairy cows in two villages of Pabna district. The study showed that 91 percent in Pathaihat and 95 percent in Monmotpara of total dairy cow owners have cultivated land with their dairy cows. The total cost per day of raising local and cross breed cow owners were Tk.

33.36 and Tk. 35.05 respectively. The total returns per day Tk. 49.20 and Tk. 80.80 for a local and cross breed dairy cow respectively.

Habibullah (1997) Conducted a research on prospects and problems of developing dairy farms in private sectors. He found that among the costs of dairy animals, feed cost is the largest item of the total cost items. The share of concentrate feed was almost double the share of roughage of all categories of farms. The higher proportion of concentrate feeds was positively related with higher number of dairy animals and also with higher milk production in the farms. Return from milk was the largest return component in total returns of dairy farming in private sector. The study showed that high price of veterinary medicine and high price of concentrate feed are biggest problem in the raising dairy animals.

Islam (2005) Conducted an analysis on socioeconomic impact of improved the supplementary feeding or rearing dairy cattle and found that dairy farming is profitable under management of small holders. Feed cost is the largest single costs. The respective net returns and BCR per day per cow were Tk. 66.12 and Tk. 1.83 respectively. Cobb-Douglas production was used to estimate contribution of the key variable in the study.

Quddus (2006) Performed a study to know the profitability of dairy farming, milk consumption pattern and marketing system of dairy owners. It was found from this study that net return of dairy milk in commercial region was significantly higher than that of the other regions due to rearing of cross breed cows and feeding them high quality. Net return from dairy enterprise was 69 percent of the gross cost and this figure was higher in semi-urban regions (75%). The positive values of marginal value product indicate that addition of dry fodder, capital investment and labor would add positive returns through milk production. Average per capita dairy milk consumption by the dairy owners of different income classes and different regions were significantly different.

**Conclusion:** A general of the studies reviewed above shows that many studies had done on dairy milk production. It can be observed for successfully dairy farming. In the literature of reviewed the studies concentrated on the profitability, resources use efficiency, economic analysis, value chain analysis, supply chain analysis, policy barrier, prospects and problems of dairy farming. But nobody showed about profitability analysis and correlation coefficient relation of profitability and

entrepreneurship opportunities on dairy farming in the Dinajpur district. This study therefore will fill the gap by showing the profitability of milk production, correlation coefficient relation with profitability and entrepreneurship opportunities of dairy farming in the Dinajpur district.

# **CHAPTER-3**

## **METHODOLOGY**

### **3.1 Introduction**

Methodology is the essential and indispensable part of any research study. Without proper methodology very often leads to a defective result. The methodology of the study is adopted by various steps to select the best method fit to attain the set objectives of research. Methods, described in the methodology, define the means or modes of data collection or, sometimes, how a specific result to be calculated. For this study farm level data are collected from every respondent directly through interview method. Primary data collection is done with a set structured questionnaire. Survey method is followed considering time and cost of data collection. Bangladeshi farmers are not enough educated and sincere about maintaining records and accounts of farm business. So interview method is appropriate for accurate information required for the study. Selection of study area, sample size, selection of respondents and sample technique, data collection procedure, period of data collection and analytical techniques followed in this study are main concern of this chapter.

### **3.2 Selection of survey area**

The study was conducted at Dinajpur district in Bangladesh. Keeping in mind the objectives of the study and considering the adjacent limitations data was collected from only sadar upazila. Borogurgola, Borobondor, Balubari, Baluadanga, Noyonpur, Rajbari, Gunjabari, Pulhat, Shikdarhat, Ramnagar, Paharpur, Goshapur, Kalitola under Dinajpur sadar upozilla were purposively as study area. They not only sell fresh milk to neighbor but also sweet shops, wholesalers, bazar.

The reasons behind the preference of the study areas were:

- Favorable for milk production and marketing.
- Most of the farms are nearby the road.
- Availability of different transportation and ways to communicate the respondents.
- Easily accessible and thus facilitate the researcher to complete the field work.
- Availability of farms relative to other areas.



- No such study was conducted in this area.

### 3.3 Sources of data

Data required for the present study were collected primary and secondary sources. Primary data were obtained from dairy farmers. Secondary data were collected from various published sources e.g. Bangladesh Bureau of Statistics (BBS), Department of Livestock (DoL), Bangladesh Bank and other related agencies in Bangladesh.

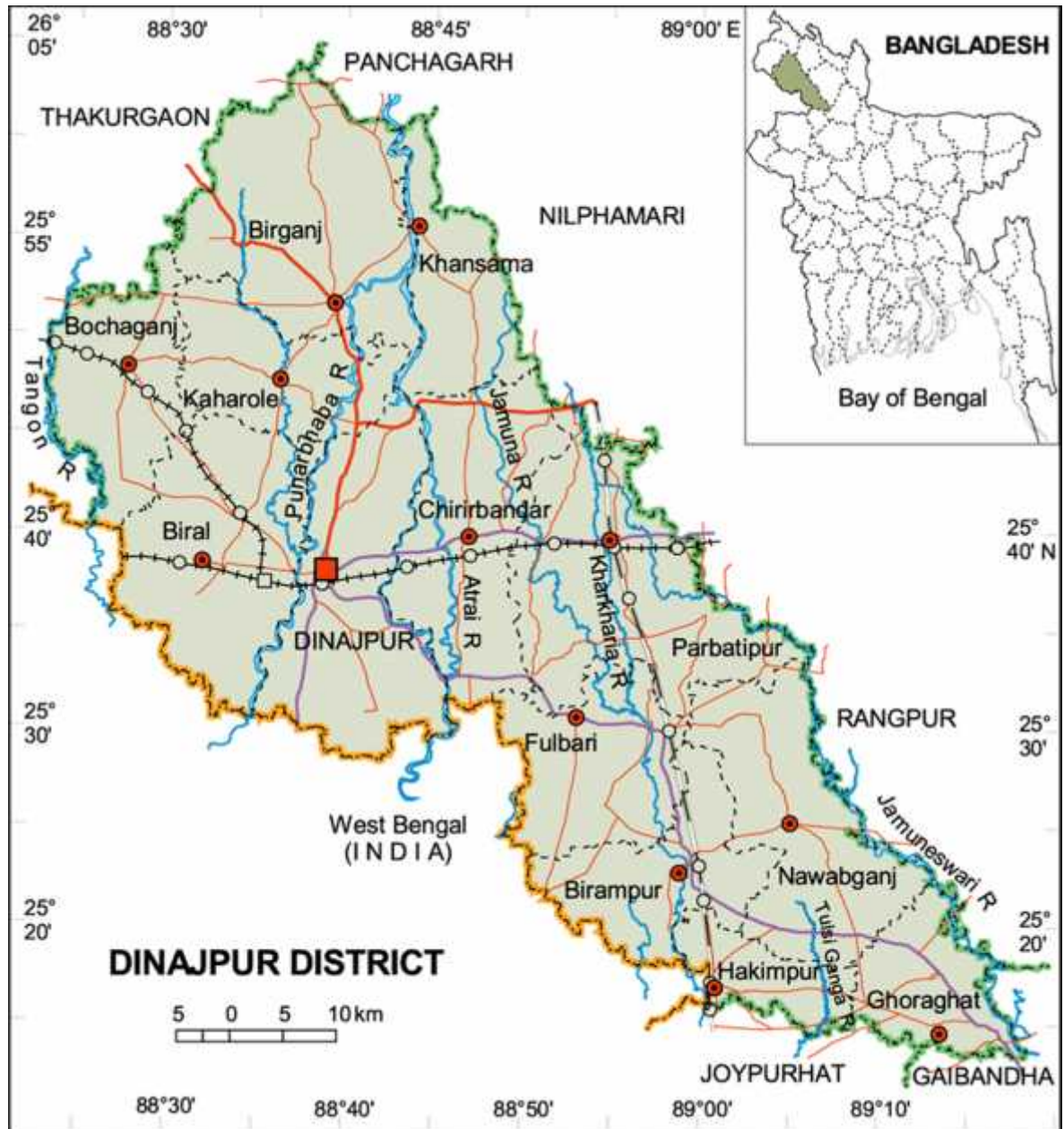


Figure: 3.1.1 Study area map

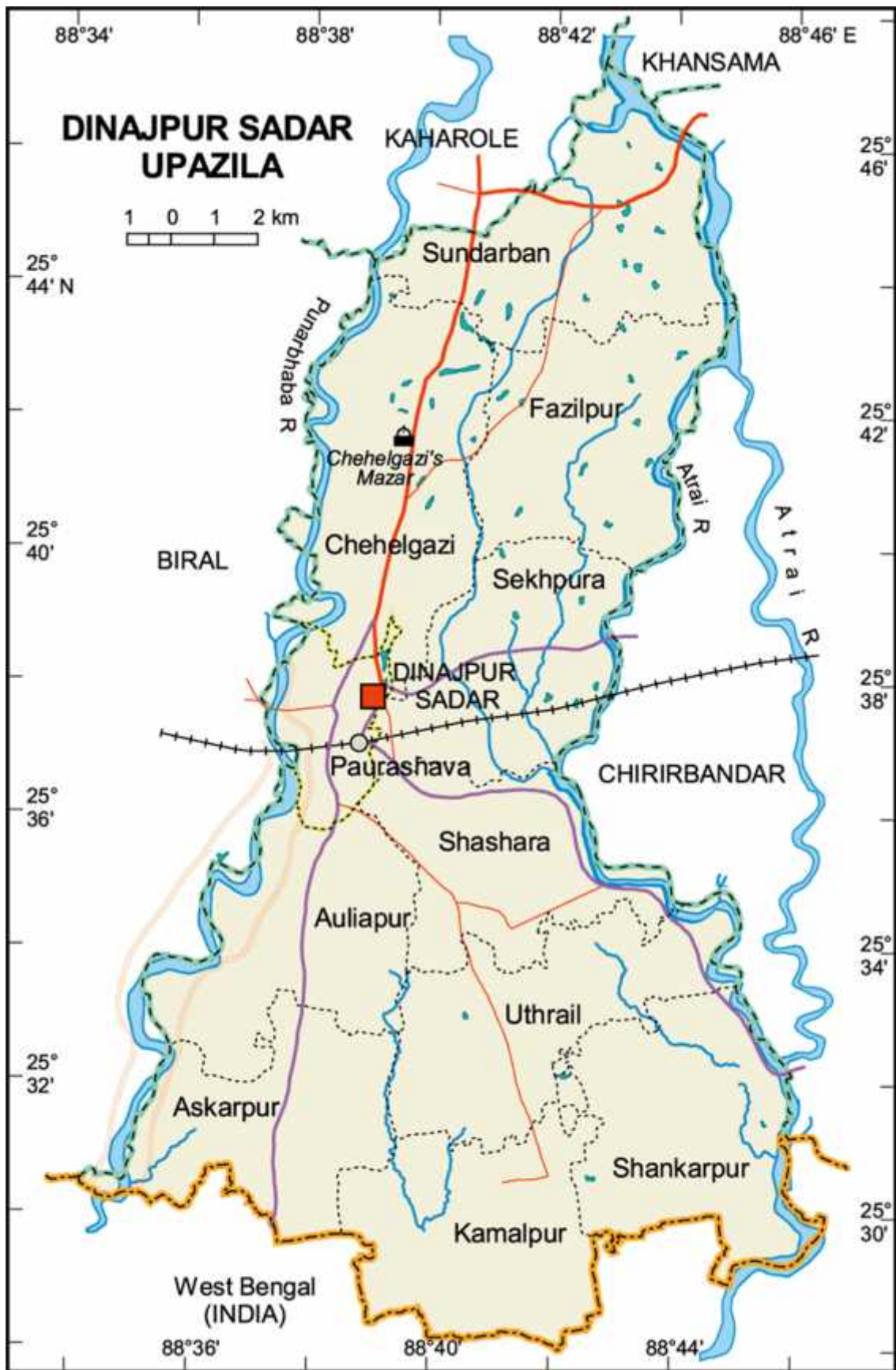


Figure 3.1.2: Study area map

### 3.4 Sample size and sampling technique

It is quite impossible to conduct an economic survey considering all population of the study areas. Sampling is a crucial part of any research work. Dairy farms operating within the Dinajpur region were taken into account for this study considering availability and easy access. Sample random sampling technique was used in sampling milk producer from the producer.

**Table 3.2.1: Villages of respondents**

<b>Village</b>	<b>Farmer</b>
Borogurgola	2
Borobondor	3
Baluadanga	3
Balubari	3
Rajbari	3
Gunjabari	2
Goshaipur	3
Noyonpur	3
Paharpur	1
Daptoripara	3
Newtown	1
Kalitola	3
Pulhut	4
Shikdarhat	2
Ramnagar	3
<b>Total</b>	<b>40</b>

**Source:** Field survey, 2019

### 3.5 Preparation of survey schedule

It is very important to prepare a draft survey schedule and pre-testing it in the survey area. Two draft survey schedule was pre-tested by researcher himself. The draft survey was conducted among 5 dairy and 5 intermediaries in selected areas. After pre-test, the questionnaire was rearranged, improved and modified according to the practical experience and prepared if for final survey. After pre-testing, correction and modification final interview schedule were developed. Primary data were collected from the dairy farmers by using semi structured questionnaires. The questions were asked in a simple manner and concern with friendly environment with explanation

where it was felt necessary. Unambiguous question were avoided in order to get accurate result.

### **3.6 Pattern of questionnaire**

A questionnaire is an important part of the research. After pre-testing the researcher himself improved and update information of the questionnaire and then selected respondents were requested by the researcher to answer the questions. All of the questions were set according to the objectives of the study. To get the accurate answer from the respondent the researcher formulated the questionnaire very carefully in Bangla. The questionnaire embodied the following parts:

#### **Questionnaire pattern for dairy farmers**

- Name, Village, Thana and Area information of farmers;
- Family members, Earnings members of family, Educated members of family;
- Type of dairy farm;
- Source of farm's production capital, Year to establish, Initial investment;
- Types of Dairy cow and calf and Milk production information;
- Cost of Fixed cost such as Bulb, Fan, Electricity cost, Water pump establishment cost etc;
- Variable cost information such as feed cost, Labor cost, Transportation cost, Medicine cost etc;
- Milk production information;
- Last year selling dairy cow, calf and cow dung price information;
- Problems of milk production solution and recommendations.

### **3.7 Collection of data**

Data collection is not an easy task. It must be done sincerely because a successful report depends on reliable data. Data was collected according to the structured questionnaire and face to face interviews had been carried out following Paper and Pencil method. After fixing the survey schedule, field level primary data were collected from the dairy cow owners through direct interview. Brief description of the purpose of the study was disclosed to the farmers before starting. Respondents were ensured that their provided information would be remain secret. Data were recorded in interview period and information was checked carefully. The respondents were requested to



provide accurate data as far as possible. Previous research paper, journal, reports, books were helpful in this case.



**Figure 3.1.4: Data collection from different respondents at Dinajpur district.**

### **3.8 Period of data collection**

Data were collected by the researcher himself during the period from 10 August to 20 October, 2019. In order to obtain reliable data, two visits were made by the researcher. The first visit was paid in August and last visit was done in October, 2019. During the period of data collection, the researcher stayed at the villages so that the dairy cow owners could give information at the time of their own conveniences.

### **3.9 Processing of data**

Data collection procedure was too much challenging. The collected data processed through editing, coding, tabulating and classifying on the base of the characteristics. MS Excel and SPSS were applied. For completing pre tabulation task, data were verified to eliminate errors, inconsistency or omission in data collection and avoid irrelevant information. Data were classified, tabulated and analyzed to accomplish the objectives of the study. Data were presented mostly in the tabular form, because it was

of simple calculation, widely used and easy to understand. Raw data were inserted in computer using the concerned software MS Excel.

### 3.10 Analytical technique

For the study following techniques will be used:

### 3.11 Farm business analytical technique

Following profit equation was used to assess the profitability of milk production. Net return is formulated by following formula:

$$i = (P_{mi}.Q_i + P_{wi}.W_i + P_{di}.D_i) - (TVC_i + TFC_i)$$

Where,

$i$  = Net return from milk and other product from per cow per day;

$P_{mi}$  = Per unit price (TK./Liter) of milk production;

$Q_i$  = Amount of milk production (Liter/Day/Cow);

$P_{wi}$  = Per unit (TK./Kg) of waste products;

$W_i$  = Total quantity (Kg) of waste products from dairy farming;

$P_{di}$  = Per unit price (Tk) of a calf of a dairy farm;

$D_i$  = Quantity of calves of dairy farm;

$TVC_i$  = Total variable cost of milk production of per day per cow (TK);

$TFC_i$  = Total fixed cost of milk production of per day per cow (TK);

$i(1,2,3,\dots,n)$  = Number of milk producer farmers.

### 3.12 Profit margin by single farmers

$$\text{Profit margin} = \frac{\text{Sale price} - \text{Production cost}}{\text{Production cost}}$$

### **3.13 Technical efficiency analysis**

#### **3.13.1 Multiple regression coefficients of the contributing variables related to profitability of dairy milk production.**

In order to conduct study in according with objectives, it was necessary to measure the selected variables. This selection contains procedure for measurement of both dependent and independent variables of the study. The procedures followed in measuring the variables are presented below.

Multiple Regression Analysis refers to a set of technical for studying the linear relationship among two or multiple variables.

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + \dots + b_nX_n + e$$

Where, Y = Profit (Dependent variable)

X<sub>1</sub> = Family member (Independent variable)

X<sub>2</sub> = Education (Independent variable)

X<sub>3</sub> = Training (Independent variable)

X<sub>4</sub> = Age (Independent variable)

X<sub>5</sub> = Experience (Independent variable)

X<sub>6</sub> = Number of cow (Independent variable)

b = regression coefficient

e = error (Residual)

##### **3.13.1.1 Measurement of Independent Variables**

The selected characteristics of the respondent farmers constituted the independent variables of the study. To keep the research within the manageable sphere, 6 independent variables were selected for the study. The procedures of measurement of the selected variables were as follows:

#### **3.13.1.1.1 Family members**

Family member of a respondents was measured in terms of actual number (dependents) of members in his family (including himself) during interview. The actual number given by the respondents made the scoring.

#### **3.13.1.1.2 Education**

Education was measured as the ability of an individual dairy farmer to read write or formal education completed up to a certain standard. It was express in terms of years of schooling. A score of one was assigned for each year of schooling completed. For example, if the respondents passed SSC examination his education score was given as 10, if passed the final examination of class seven, his education score was given as 7, if the respondent did not know how to read and write his education score was given as 0 (zero)

#### **3.13.1.1.3 Training**

Training on dairy milk production is an important factor which can play an important role in the dairy farming. In measuring score of 1 was assigning for each training.

#### **3.13.1.1.4 Age**

The age of an individual is one of the important pertaining to his personality make up which can play an important role in his adoption behavior. Age of the respondents was measured in terms of actual years from their birth to the time of interview.

#### **3.13.1.1.5 Experience**

The experience of an individual is one of the important pertaining make up which can play a vital role in dairy farming. Experience of the respondents was measured in terms of establishment of dairy farm.

#### **3.13.1.1.6 Number of Cow**

Number of cow is also an important pertaining make up which can play an important role in dairy farming. The actual number given by the respondents made the scoring.



### **3.13.1.2 Measurement of Dependent Variable**

#### **3.13.1.2.1 Profit**

Profit was considered as the dependent variable of the study. The dependent variable profit measured income of a dairy farmer by selling milk and cow dung minus variable and fixed cost.

### **3.13.2 Profitability analysis**

Cost and return analysis is the most common method of determining and comparing the profitable of different dairy farm family. In the present study, the profitability of dairy farming is calculated by the following way-

#### **3.13.2.1 Calculation of Gross Return**

Gross return per cow per day was calculated by multiplying the total amount of product and by-product by their respective prices used for per cow per day.

Gross return = Amount of the milk  $\times$  Average price of the milk + Value of by-product.

#### **3.13.2.2 Calculation of Gross Margin**

Gross Margin is defined as the difference between Gross Return and Variable Cost. Generally, farmers want to maximize return over variable cost of dairy milk production. The argument for using the gross margin analysis is that the farmers are interested to get returns over variable cost. Gross Margin was calculated on TVC basis. Gross Margin per cow per day was obtained by subtracting variable costs from Gross Return. That is, Gross Margin = Gross return – Variable Cost

#### **3.13.2.3 Calculation of Net Return**

Net Return or Profit was calculated by deducting the total production cost for per cow per day from the Total Return or Gross Return from per cow per day. That is, Net Return = Total Return – Total Production Cost

#### **3.13.2.4 Undiscounted Benefit Cost Ratio (BCR)**

Average Return to each taka spent on dairy milk production is a main criterion measuring profitability. Undiscounted BCR was estimated as the ratio of Total Return to Total Cost per cow per day.  $BCR = \text{Total Return} / \text{Total Cost}$

#### **3.14 Problem faced in data collection**

During the period of data collection, the following problem were faced

- Most of the farmers were uninterested to answer questions since they had very little idea about research and assumed that the researcher might use the information against their interest. To earn the confidence of the farmers a great deal of time was spent.
- There was the limitation of time and hence necessary information had to be collected relatively within a short period of time.
- It was difficult to convince the farmers on the utility of this study because of their ignorance and illiteracy.
- The farmers were afraid of imposition of new taxes and they always tried to avoid in providing information relating to the actual size of holding, income acquired from dairy cow raising.
- Sometimes farmers were not available at home which needed even more than two or three visits to conduct a single interview.
- Most of the respondent did not have enough time and interest to sit for the interview, because they remained busy with their outside farm activities.

## CHAPTER-4

### SOCIO-ECONOMIC PROFILE OF DAIRY FARMERS

#### 4.1 Introduction

An attempt was made in this chapter to identify some socio-economic profiles of dairy farmers. Socio-economic characteristics of the farmers are important in influencing production planning. Type of family, educational qualification, employment status, enterprise combination, percentage of income from dairy farm etc. are discussed here. For this reason various information related to age, gender, family size, occupation, training, educational level, source of fund and herd size of the farmers have been taken into account in this study. This chapter will describe briefly the socio-economic profile such as gender status of the households, age, family size, educational level etc. of the farmers. A brief discussion of these aspects is given below.

#### 4.2 Age of farmers

Age of dairy farmers play a crucial role in milk production and better management of the dairying activities. The important demographic factor such as age, measured in years, was analyzed to know the working age of members of families. The age group of farm family members was classified into five categories in this research (Table 4.2.1). These were: ) 25-35 years ) 35-45 years ) 46-55 years ) 56-65 ) 65- above years. In the study area, about 15% of total farmers belonged to the age group 25-35 years, 50% were 36-45 years, 22.5% were 46-55 years, 12.5% were 56-65 years and no people in the group in 66-Above years (Table 4.2.1).

**Table 4.2.1**Age range of sample farmers

Range of age (Years)	Number of Farmers	Percent
25-35	6	15
36-45	20	50
46-55	9	22.5
56-65	5	12.5
66-Above	0	0
<b>Total</b>	<b>40</b>	<b>100</b>

**Source:** Field Survey, 2019

### 4.3 Farmers professional distribution percentage

From the collected data it can be estimated that the highest proportion of respondents depends on Dairy Business and the percentage was about 60% and the lowest percent belonged to Dairy + Job and the rate was about 10%. The other two groups Farmer + Dairy and Farmer + Business belonged to 15% and 15% respectively. The data was expressed by following table (Table 4.2.2).

**Table 4.2.2 Professional distribution of the respondents**

<b>Profession</b>	<b>Number of farmers</b>	<b>Percentage</b>
Farmer + Dairy	6	15
Dairy Business	24	60
Farmer + Businessman	6	15
Dairy + Job	4	10
<b>Total</b>	<b>40</b>	<b>100</b>

**Source:** Field survey, 2019

### 4.4 Educational qualification of farmers

Education is a most important factor for skill development and improving marketing techniques. Education of the family members can contribute to ensuring food security at household level directly or indirectly. An educated person is much aware about nutrition, earnings etc. than an illiterate person. In the study area 2.5% people are illiterate, 5% people are class 1-5, 25% people had Hon's and above, 30% people passed S.S.C or H.S.C and 37.5% people passed class 6-10 (Table 4.2.3). This increased educational entitlement had supported the production and marketing of milk in the study area as well as this also helped to improve the ability to acquire new ideas in the relation to market information and improved production of milk in the household (Table 4.2.3).

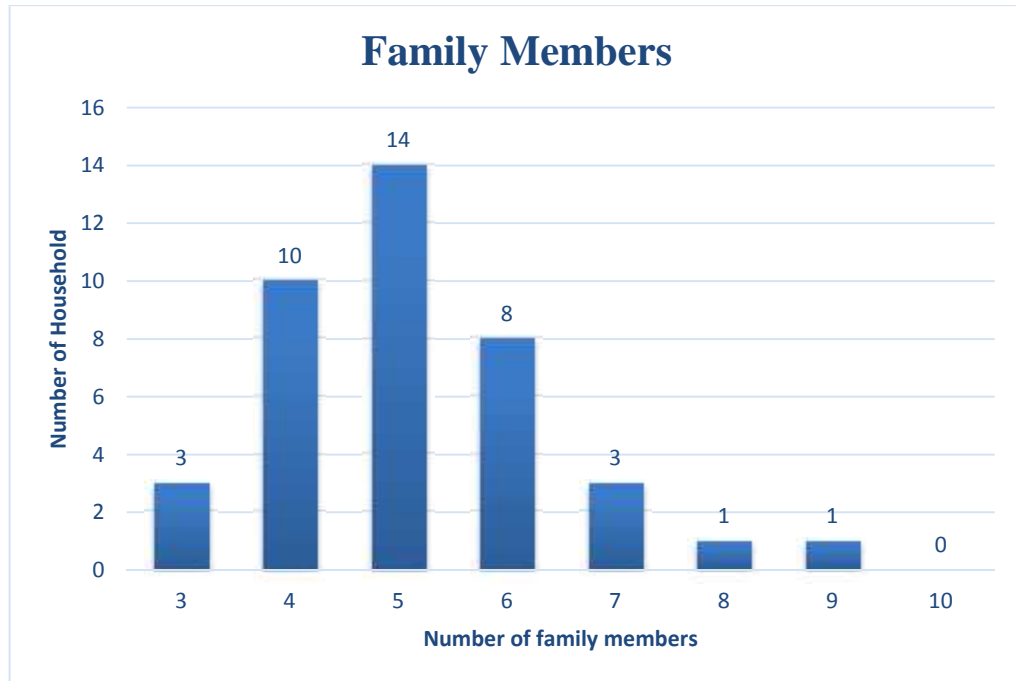
**Table 4.2.3 Percentage of Educational qualification of sample farmers**

<b>Educational Status</b>	<b>Number of Farmers</b>	<b>Percentage</b>
Class 1-5	2	5
Class 6-10	15	37.5
Class 11-12	12	30
Hon's and Above	10	25
Illiterate	1	2.5
<b>Total</b>	<b>40</b>	<b>100</b>

**Source:** Field survey, 2019

#### 4.5 Number of family members

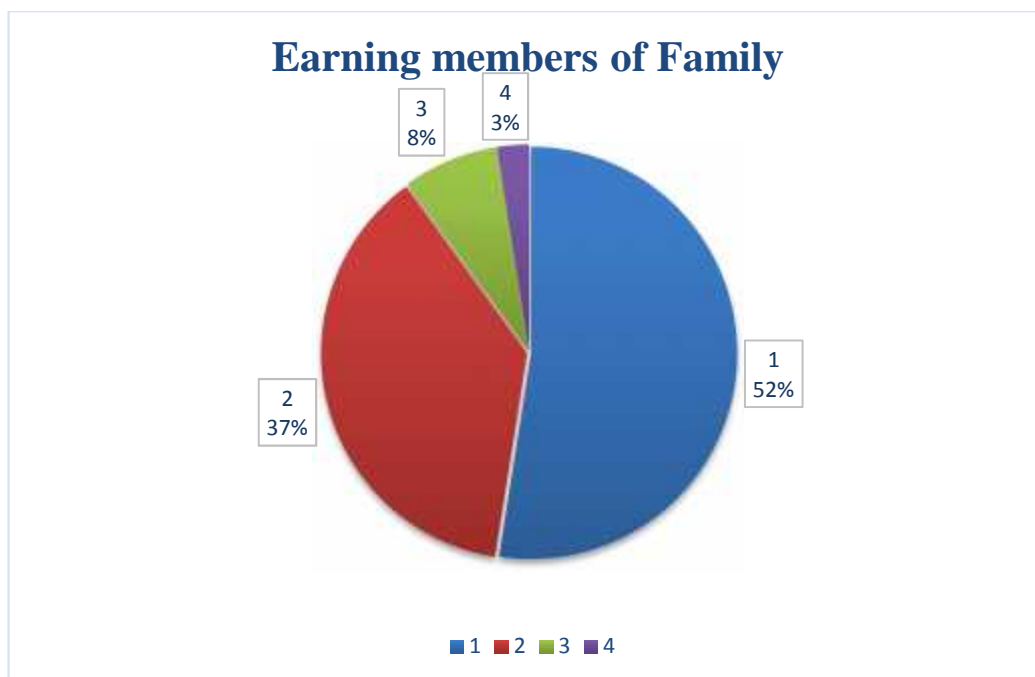
About 35% of the farmer family has 5 family members. Most of the families were small family. Very few were extended family. Family members of dairy farmers in the study area is given below through Bar-diagram (Figure 4.1.1).



**Figure 4.1.1: Family members of sample farmers**

#### 4.6 Earning members of Farmers family

The highest proportion of family members had only income earner and the percentage of their number was about 52%. Others members depends on that person. About 37% family had two income earners. About 8% family had three income earners and 3% family four income earners. This information is presented in a pie-chart below (Figure 4.1.2).



**Figure 4.1.2: Percentage of earning members of family**

#### 4.7 Educational members of Farmers family

Education is the backbone of the nation. But percentage of education is quite low in dairy farm family. From, this study the highest proportion of family had three educated members and the percentage was estimated about 37.5% and the lowest was estimated by six persons which was 2.5%. The data of educational members of farmer family was shown below in tabular form (Table 4.2.4).

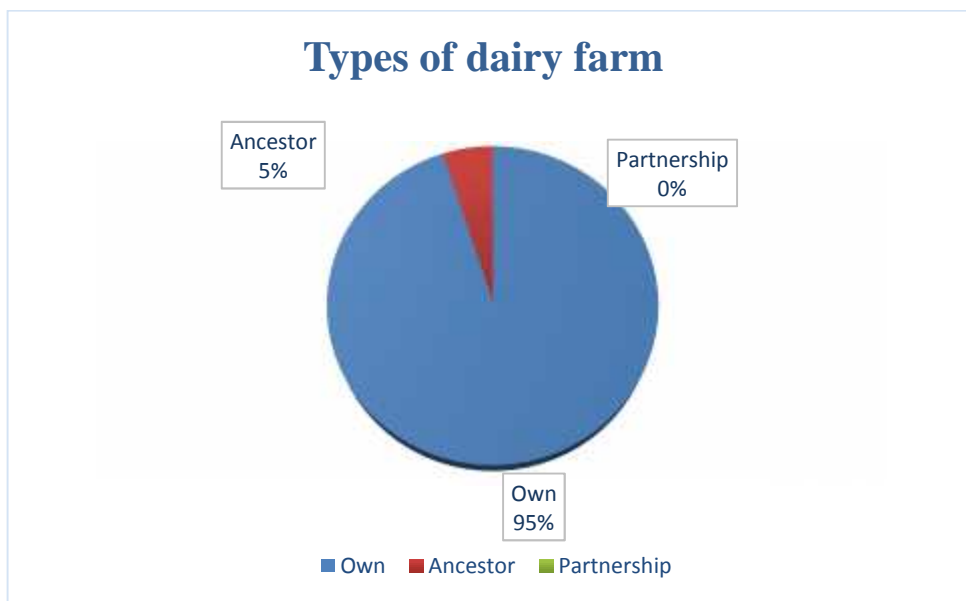
**Table 4.2.4 Educated member of family of farmers**

Educated members of family	Household	Percentage
0	0	0
1	2	5
2	13	32.5
3	15	37.5
4	5	12.5
5	4	10
6	1	2.5
7	0	0
<b>Total</b>	<b>40</b>	<b>100</b>

**Source:** Field Survey, 2019

#### 4.8 Type of dairy farm

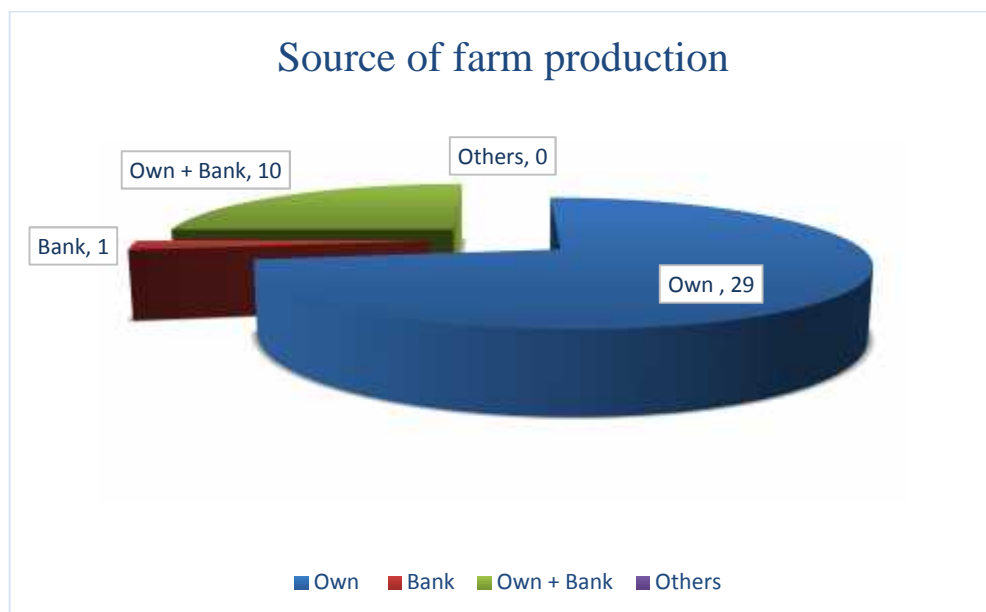
Though dairy farming is a lucrative business for recent situation, many respondents are still uninterested to invest in this sectors. Uncertainty and risk associated to dairy farming. It was observed that most of the dairy farm was establish with own finance, the percentage was about 95%. Only 5% respondents run their business through Ancestor farming and there was no partnership farm in the study area. The result was shown by pie-chart (Figure 4.1.3).



**Figure 4.1.3: Types of Dairy farm**

#### 4.9 Source of Farms production capital

For establishing dairy farms, about 72% depend their own source for capital and 3% farmers started their business with bank loan. About 25% farmers started their business with own capital and bank loan. The data show by pie-chart below (Figure 4.1.4)



**Figure 4.1.4: Source of Farm production**

#### 4.10 Initial investment

Initial investment is the vital factor for any successful business. From this observation it was estimated that the most of the farmers started their business 2lac-5lac and the percentage was about 35%. The lowest percentage of farmers started their business with 10lac above and percentage was about 2.5%. This result also shown below in tabular form (Table 4.2.5)

**Table 4.2.5 Initial investment of the sample farmers**

Taka Range	Farmer	Percentage
10k - 30k	2	5
31k - 50k	5	12.5
51k - 75k	4	10
76k - 1 lac	3	7.5
1 lac - 2 lac	9	22.5
2 lac - 5 lac	14	35
5 lac - 10 lac	2	5
10 lac - Above	1	2.5
<b>Total</b>	<b>40</b>	<b>100</b>

**Source:** Field survey, 2019



#### **4.11 Conclusion**

This chapter analyzed the socio-economic attributes of the sample farmers. The findings of analysis clearly indicate the socio-economic characteristics from each other in respect of age, profession, educational qualification, family size, earning members of family, educational members of farmer's family, types of dairy farm, source of farm production, initial investment of farmer's for establishment of farm.

## **CHAPTER-5**

### **PROFITABILITY ANALYSIS OF MILK PRODUCTION**

#### **5.1 Introduction**

Cost plays an important role in decision making for the producers in each production process. This chapter depicted the estimation and analysis of costs of dairy milk production. The costs were classified into two types e.g. variable costs and fixed costs.

This chapter measures production profitability in terms of dairy milk production per cow per day, gross return, gross margin, net return and undiscounted benefit-cost ratio are discussed. Financial return of dairy farming was estimated from the point of view.

For analytical advantages, the cost items were classified under the following heads:

- A) Cow Feed Cost
  - i) Straw
  - ii) Green Grass
  - iii) Rice Dust
  - iv) Oil cake
  - v) Mineral Mix
  - vi) Wheat Husk
  - vii) Kasari Husk
  - viii) Soya bean Meal
  - ix) Broken rice
- B) Labor Cost
- C) Doctor + Medicine Cost
- D) Electricity Cost
- E) Water pump
- F) Housing Cost
- G) House rent Cost
- H) Cost of Capital

## **5.2 Cost analysis of dairy milk producers**

### **5.3 Cost of rearing dairy cows**

Total production cost has a crucial effect on the farming decision. Table (5.2.1) shows the total cost per day per cow and also per liter per day. The total cost per day per cow was estimated at Tk. 232.78. Hence variable cost and fixed cost were calculated separately. Average variable cost was Tk. 217.62 and average fixed cost was Tk. 15.16. The costs according to projected item are discussed below:

#### **5.3.1 Variable cost**

The variable cost are the costs of inputs used in day to day operation. These costs vary on the basis of the level of production.

##### **5.3.1.1 Feed Cost**

Feed cost was one of the major cost items of rearing dairy cows. Cost of feed includes expenses on Straw, Green Grass/ Napier Grass, Rice dust, Oil cake, Mineral mix, Wheat husk, Khesari husk, Soya bean meal, Broken rice etc. According to (Table 5.2.1) Cow feed cost accounted for maximum amount of cost and was estimated 217.62 Tk./Cow/Day. Feed cost shared 77.10 percent.

- i) Expenses on Straw among various feed items was 26.37 Tk./day/cow and its share in total cost was 11.93%
- ii) Green grass or Napier grass were most important for dairy cow and their share were 40.19 Tk./cow/day and 17.27%
- iii) Cost on Rice dust among various feed cost items was 25.57 Tk./day/cow and its share 10.98%
- iv) Average cost on Oil cake was 6.02 Tk./day/cow and its share in total coat was 2.56%
- v) Cost on Mineral mix among various feed cost items was 4.02 and its share in total cost was 1.73%
- vi) Wheat husk is the most important in dairy milk production and their shares were 37.60 Tk./day/cow and 16.15%
- vii) Average expenses on Khasari husk among other feed items was 8.31 Tk./day/cow and its share in total cost was 3.57%
- viii) Average cost on Soya bean meal among other feed items was 15.94 Tk./day/cow and its share in total cost was 6.85%

- ix) Cost on Broken rice among various feed cost items was 15.45 Tk./day/cow and its share in total cost was 6.64%

#### **5.3.1.2 Labor Cost**

Labor cost is the most important cost among all variable cost for dairy milk production and it's has significant impact on income and employment generation to people other than dairy farmers. It appeared from Table (5.2.1) that average labor cost per day per cow for dairy milk production was estimated at 23.15 Tk. and its share in total cost was 9.95%. (Table 5.2.1)

#### **5.3.1.3 Doctor Cost + Medicine Cost**

Another most important cost was Veterinary cost (Doctor cost + Medicine cost) which was considered by taking into account the actual cost of Doctor and Medicine incurred by the dairy milk producers. Veterinary cost includes Doctor's fees and medicine were two major elements of the total veterinary cost. The total veterinary cost per day per cow estimated to 9.08 Tk. and its share on total milk production cost was 3.90%. (Table 5.2.1)

#### **5.3.1.4 Electricity Cost**

Utilities were very essential which includes light, fan, maintaining motor pump etc. Electricity cost comprising maintaining light, temperature and the water supply in the dairy farm. The average electricity cost per day per cow was estimated at 4.22 Tk., which is accounted 1.81% of the total cost of dairy milk production. (Table 5.2.1)

#### **5.3.1.5 Miscellaneous Cost**

The cost included some items like container, balti, van etc. which was not included in variable cost and fixed cost. Miscellaneous costs per day per cow were 1.17 Tk. for a dairy farm and its share on total cost of dairy milk production was 0.73% (Table 5.2.1)

#### **5.3.2 Fixed Cost**

Costs, those do not change in relation to the amount of output changes and time frame of the production changes and are incurred even when production is not undertaken are referred to as Fixed costs. Cost of housing cost, Cost of capital and Property tax were included in the fixed cost calculation. Total fixed cost per cow per day for dairy milk production in the study area was estimated 15.16 Tk. and its share in total cost was 6.51% (Table 5.2.1)

**Table-5.2.1 Cost of rearing dairy cows per cow per day**

<b>Cost items</b>	<b>Average TK/Day/Cow</b>	<b>Percentage of Total</b>
<b>Variable Cost</b>		
A. Cost of Feed	179.47	77.10
Straw	26.37	11.93
Green Grass/ Napier Grass	40.19	17.27
Rice Dust	25.57	10.98
Oil Cake	6.02	2.56
Mineral Mix	4.02	1.73
Wheat Husk	37.60	16.15
Kesari Husk	8.31	3.57
Soya bean Meal	15.94	6.85
Broken Rice	15.45	6.64
B. Labor Cost	23.15	9.95
C. Doctor + Medicine Cost	9.08	3.90
D. Electricity Cost	4.22	1.81
E. Miscellaneous Cost	1.70	0.73
<b>Total Variable Cost (TVC)</b>	<b>217.62</b>	<b>93.49</b>
<b>Fixed Cost</b>		
A. Housing Cost	1.17	0.51
B. Cost of Capital	13.36	5.74
C. Property Tax	0.63	0.27
<b>Total Fixed Cost (TFC)</b>	<b>15.16</b>	<b>6.51</b>
<b>Total Production Cost</b>	<b>232.78</b>	<b>100</b>

**Source:** Field survey, 2019

### **5.3.2.1 Housing cost**

Construction of dairy farm house is an important part of the total milk production cost for a dairy farm. Protection of dairy cows from sunshine, rainfall, storm, cold and to provide comfort to cow is the purpose of housing. Different types of house were built by farmers according to their capacity and financial condition. Few of them had Pacca (Building) house, few had tin shed (Kacha= normal) house. Cost of housing was also different on the basis of type of house. The depreciation, repairing, and interest on average value of the house were considered in the cost of housing was calculation of the cost of housing. (Table 5.2.1)

Depreciation was calculated using straight line method, which considered the rate of depreciation as constant for entire life span of the capital. According to this method, the depreciation was same in each year for the entire production process.

The amount of annual depreciation was calculated as follow:

$$\text{Depreciation} = \frac{\text{Original value} - \text{Salvage value}}{\text{Lifespan}}$$

The working formula for estimation of interest on average value was as below:

$$\text{Interest on Average value} = \frac{\text{Beginning value} - \text{End value}}{2} \times \text{Interest rate}$$

Beginning value of housing was calculated by subtracting total depreciation up to present year from the original value of housing.

$$\text{Beginning Value} = [\text{Original value} - (\text{Annual depreciation} \times \text{Present age})]$$

Ending value was assessed from the difference between Beginning value and Annual depreciation.

$$\text{End Value} = \text{Beginning value} - \text{Annual depreciation}$$

Interest rate was assumed to be 10 percent per annum. The housing cost about Tk. 1.17 per cow per day which share 0.51% of total cost of dairy milk production.

### 5.3.2.2 Cost of Capital

Cost of capital was most significant fixed cost which was measured in this study as the interest on average value used capital on dairy milk production. It was assumed that dairy farmers had purchased the cow at the beginning of the year and sold it at the end of one year. The interest on average value of used capital used was measured at the rate of 10 percent interest rate per annum.

The cost calculated as follows:

$$\text{Capital cost} = \frac{\text{Beginning value} - \text{End value}}{2} \times \text{Interest rate}$$

Cost of capital per day per cow were estimated Tk. 13.36 which shared 5.74% of total cost of dairy milk production. (Table 5.2.1)

### **5.3.2.3 Property tax**

Most of the dairy farmers were small in nature in the study area. Maximum number of farmers have own house for dairy milk production. Property tax is shared a small amount of share in dairy milk production. The property tax per cow per day estimated Tk. 0.63 and its share was 0.27% in total cost in milk production. (Table 5.2.1)

## **5.4 Returns from Dairy farm**

### **5.4.1 Gross Return**

Gross return is monetary value of the product. Gross return from per cow per day was estimated by summation of value of milk yield per cow per day, average value of calf sold by dairy farm and the average value of by products sold by the farm. Value of milk was calculated by multiplying the total amount of milk production per cow per day with their respective market prices. The average value of calf was calculated as the average value of a calf per day.

In the study area, average yield of dairy farm milk per day per cow was 9.5 liters and its money value was Tk. 475. The average value of calf and cow dung were Tk.90 and Tk. 1.8 respectively. Gross return from milk produced per cow per day, calf sold, cow dung was 567 Tk. (Table 5.2.1)

### **5.4.2 Net Return**

Net return is referred to as producer's income from business he or she runs. Profitability of dairy milk production can be calculated by different method among them net return is an important formula. Net return is the difference between gross return and total costs. In case of dairy milk production total costs comprised of variable costs, fixed costs and marketing costs. Net return on per cow per day was measured 318.27 at Tk. which implies that dairy milk production is a profitable enterprise for small and medium dairy farmers recently. (Table 5.2.1)

**Table- 5.2.2 Gross Margin and Net Return**

<b>Particulars</b>	<b>Tk/Day/Cow</b>
a) Gross Return	567
b) Variable production Cost	217.62
c) Fixed production Cost	15.16
Production cost	232.78
Marketing cost	15.95
d) Total cost ( Production+ Marketing)	248.73
e) Gross Margin (a-b)	349.38
f) Net Return (a-d)	318.27
g) Return on Cost [(f/d)×100]	127.96
h) BCR (a/d)	2.28

**Source:** Field survey, 2019

### **5.4.3 Gross Margin**

Main focus was maximum return over variable cost of dairy milk production framers. Fixed cost calculation of dairy milk production is not quite easy test. This is the reason behind to avoid the fixed cost from total return. The relative profitability of dairy farming can be estimated by gross margin which takes into account only the variable cost include in the production process. The gross margin of dairy milk production was estimated at Tk. 349.38 per cow per day. (Table 5.2.1)

### **5.4.4 Benefit Cost Ratio (Undiscounted)**

BCR or Benefit Cost Ratio was calculated by dividing gross return by total cost of dairy milk production per cow per day. Return per taka invested can be known from benefit cost ratio. It helps to decide whether to invest in dairy farm or not. BCR is the main decision making criteria for investment. Financial efficiency of the dairy milk production was estimated by BCR in this study. The benefit cost ratio of dairy milk production per cow per day was 2.28 which implies that Tk. 2.28 would be earned by investing Tk. 1.00 for dairy milk production per cow per day. So, the dairy farming was found to be profitable enterprise for dairy farmers today. (Table 5.2.1)



**Table-5.2.3 Marketing cost per cow per day**

<b>Cost items</b>	<b>Tk./Day/cow</b>
1. Labor	2.05
2. Electricity	3.10
3. Polythine cost	2.50
4. Transportation cost	5.20
5. Container cost	3.10
<b>Total Marketing cost</b>	<b>15.95</b>

**Source:** Field survey, 2019

### **5.5 Concluding Remarks**

It was clear from the results that per cow per day total variable cost for dairy milk production were more than per cow per day total fixed costs for dairy milk production. Dairy milk production provides greater returns to the dairy farmers. Due to high yield potentiality and high demand in rural and urban markets, dairy farming is a profitable business and lucrative one recently. Most of the farmers wanted to continue their dairy farming for its profitable nature.

## CHAPTER-6

### CORRELATION COEFFICIENT THAT INFLUENCES THE PROFITABILITY OF MILK PRODUCTION

#### 6.1 The Contribution of the selected characteristics of the respondents on their Profitability of milk production

In order to estimate the farmers profitability of milk production, the multiple regression was used which is shown in the Table 6.2.1

**Table 6.2.1** Multipleregression coefficients of the contributing variables related to profitability of dairy milk production.

Dependent variable	Independent Variable	Coefficient	Significant	R <sup>2</sup>	Adj. R <sup>2</sup>	F
Income	Family. member	.030	.827	.766	.724	18.020
	Education	.218**	.005			
	Training	.041	.712			
	Age	.040	.727			
	Experience	.225*	.046			
	No. of. cow	.632**	.000			

\*\* Significant at  $p < 0.01$  \* Significant at  $p < 0.05$

Table 6.2.1 shows that education, experience, number of cow of the respondents had significant positive contribution with profitability of dairy milk production. Of these, education and number of cow were most important contributing factors (significant at the 1% level of significance) and experience was less important contributing factors (significant at 5% level of significance). Coefficient of the other selected variables have less contribution on their profitability of milk production.

The value  $R^2$  is a measure of how of the variability in the dependent variable is accounted by the independent variables. So, the value of  $R^2 = .766$  means that independent variables accounts for 76% of the variation with their profitability of milk production. The F ratio is 18.020 which is highly significant ( $p < 0$ )

However, each predictor may explain some of the variance in respondent their profitability of milk production simply by chance. The adjusted  $R^2$  value penalizes the addition of extraneous predictors in the model, but value 0.724 is still show the variance is farmers their profitability of milk production farmers can be attributed to the predictor variables rather than by chance. In summary, the models suggest that the respective authority should be considers the education level of farmers, number of cow and experience has some predictive importance has been discussed below:

### **6.1.1 Contribution of family members on farmer profitability of dairy milk production:**

From the multiple regression, it was concluded that the contribution of family member of dairy farmers profitability of milk production was measured by the testing the following null hypothesis;

“There is no contribution of number of family members of the dairy farmers to their profitability of milk production”

The following observations were made on the basis of the value of the concerned variable of the study under consideration.

- a) So the null hypothesis could be rejected.
- b) The direction between organization participation and profitability was positive.

The coefficient of family member was (.030). So, it can be stated that as family member increased by one unit, farmer's profitability of milk production increased by .030 units.

Based on the above finding, it can be said that dairy farmers had more family member increased dairy farmers profitability of milk production. So, number of family member has significant contributed to dairy farmers of milk production.

### **6.1.2 Contribution of education level of farmer profitability of milk production:**

From the multiple regression, it was conducted that the contribution of education level of farmer's profitability of milk production was measured by the testing the following null hypothesis;

“There is no contribution education level of farmers to their profitability of milk production”

The following observation were made on the basis of the value of the concerned variable of the study under consideration.

- a) The analysis showed that education level of farmers was significant at 1% level of profitability.
- b) The null hypothesis could be rejected.
- c) The direction between number education level of farmers and profitability was positive.

The coefficient of education level of farmers was (0.218). So, it can be stated that as education level increased by one unit, farmer's profitability of milk production increased by 0.218 units.

Based on above finding, it can be said that dairy farmers had more level of education increased dairy farmers profitability of milk production. So the education level of farmers has high significant contributed to dairy farmers in milk production.

### **6.1.3 Contribution of training of farmer profitability of milk production:**

From the multiple regression, it was conducted that the contribution of training of farmer's profitability of milk production was measured by the testing the following null hypothesis;

“There is no contribution training of farmers to their profitability of milk production”

The following observation were made on the basis of the value of the concerned variable of the study under consideration.

- a) The null hypothesis could be rejected.
- b) The direction between number education level of farmers and profitability was positive.

The coefficient of training of farmers was (0.041). So, it can be stated that as training increased by one unit, farmer's profitability of milk production increased by 0.041 units.

Based on above finding, it can be said that dairy farmers had more training increased dairy farmer's profitability of milk production.

#### **6.1.4 Contribution of age of dairy farmer profitability of milk production:**

From the multiple regression, it was concluded that the contribution of age of farmers profitability of milk production was measured by the testing the following null hypothesis;

“There is no contribution of age of the dairy farmers to their profitability of milk production”

The following observations were made on the basis of the value of the concerned variable of the study under consideration.

- a) So the null hypothesis could be rejected.
- b) The direction between organization participation and profitability was positive.

The coefficient of age of farmers was (.040). So, it can be stated that as age of farmers increased by one unit, farmer's profitability of milk production increased by .040 units.

Based on the above finding, it can be said that dairy farmers had more age of farmers increased dairy farmer's profitability of milk production. So, farmer's age has significant contributed to dairy farmers of milk production.

#### **6.1.5 Contribution of experience of farmer profitability of milk production:**

From the multiple regression, it was concluded that the contribution of experience of farmers profitability of milk production was measured by the testing the following null hypothesis

“There is no contribution of experience of the dairy farmers to their profitability of milk production”

The following observations were made on the basis of the value of the concerned variable of the study under consideration.

- a) The contribution of experience of the dairy farmers to their profitability of milk production was significant at 5% level (.046)
- b) So the null hypothesis could be rejected.
- c) The direction between organization participation and profitability was positive.

The coefficient of experience was (.225). So, it can be stated that as experience increased by one unit, farmer's profitability of milk production increased by .632 units.

Based on the above finding, it can be said that dairy farmers had more experience increased dairy farmers profitability of milk production. So, experience has high significant contributed to dairy farmers of milk production.

#### **6.1.6 Contribution of number of cow of farmer profitability of milk production:**

From the multiple regression, it was concluded that the contribution of number of cow of farmers profitability of milk production was measured by the testing the following null hypothesis;

“There is no contribution of number of cow of the dairy farmers to their profitability of milk production”

The following observations were made on the basis of the value of the concerned variable of the study under consideration.

- a) The contribution of number of cow of the dairy farmers to their profitability of milk production was significant at 1% level (.000)
- b) So the null hypothesis could be rejected.
- c) The direction between organization participation and profitability was positive.

The coefficient of number of cow was (.632). So, it can be stated that as number of cow increased by one unit, farmer's profitability of milk production increased by .632 units. Based on the above finding, it can be said that dairy farmers had more number of cow increased dairy farmers profitability of milk production. So, number of cow has high significant contributed to dairy farmers of milk production.

**Value of  $R^2$ :**The values of the coefficient of multiple determination of dairy milk production was found that to be 0.766 which implies that about 76 percent of the total variation in the milk production could be explained by the included explanatory variables of the model. So we can say the goodness of fit of this regression model is better since  $R^2$  indicates the goodness of fit of the regression model.

**Adjusted  $R^2$ :** Here the term adjusted means adjusted for the degrees of freedom. The adjusted  $R^2$  for dairy milk production was found to be 0.724 which indicated that about 72 percent of the variations of the output were explained by the explanatory variables included in the model.

**F-value:** The F-statistics was computed to denote the overall goodness of fit of any fitted model. The F-value for the dairy milk production was estimated at 18.020 which were .it means that the explanatory variables included in the model were important for explaining the variation in gross production of dairy milk production.

# **CHAPTER-7**

## **SUPPLY CHAIN AND ENTREPRENEURSHIP OPPORTUNITIES OF DAIRY FARM**

### **7.1 Introduction**

The concept of supply chain management is rapidly developing with high rate in the contemporary business world. Specially for agricultural sector. This chapter identified the main actors (farmers, wholesalers, retailers and sweet shoppers) of supply chain of raw and dairy products in a systematic way.

Value addition is mainly regarded as the difference between total expenses involved in marketing or of a product and total revenue accruing from its sales. This chapter goes through the existing marketing channel and employment opportunities of dairy farmers in the study area.

### **7.2 Milk supply chain**

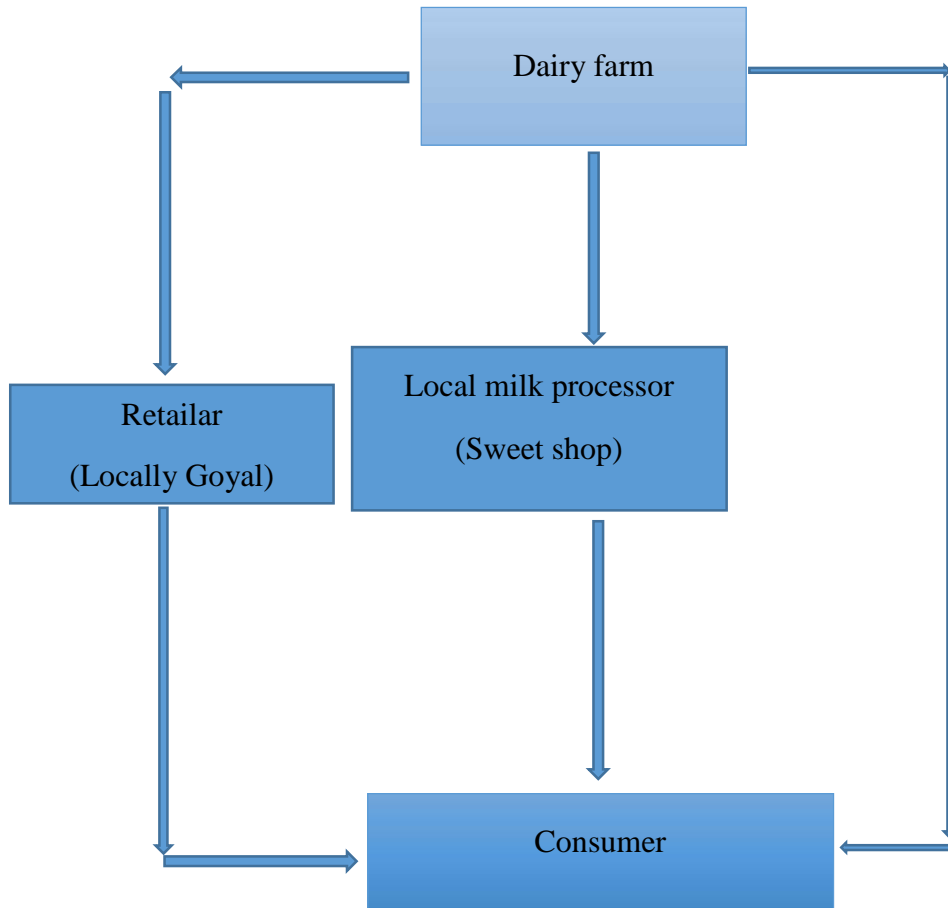
The concept of supply chain has come into existence since 1980s. A supply chain is a network of facilities and distribution options that performs the functions of

- Procurement of raw materials;
- Transformation of these materials into intermediate and finished products and services through processing;
- The distribution and delivery of these finished products or final services to consumers.

Each supply chain thus provides certain or specific types of end products or services to the end users at the end point of the supply chain (Douma et al., 2004)

Supply chain analysis intended to generate a systematic knowledge of flows of goods and services from the origin (producers) to the final destination (consumers) through different market intermediaries. The market supply of dairy products is the end point of a chain of service activities ranging from input supply and farm services to processing, quality control and product marketing. Distribution channels of milk was shown with figure for farmers, wholesalers, retailers and sweet shoppers on the basis of data collection in some selected areas in Dinajpur region.





**Figure 7.1.1 Supply chain of dairy milk production in study area.**

### **7.3 Supply chain of milk market**

Dairy milk producers are the prime actor and play the crucial role in the milk supply chain. Dairy milk producers in the selected area were farmers who produce milk with commercial objectives e.g. maximization of profit. The dairy farmers were scattered in the study area. Generally they sold raw milk to customer, sweet shop, retailer etc. There are some way of supply chain in milk market in the study area.

#### **7.3.1 Dairy farm to customer**

The maximum number of milk sell from the dairy farm in the study area. Customer went to the farm and purchased their own need of milk. It is very easy to the customer for purchasing milk from the dairy farm. In the study area a huge numbers of small farm were available here. And they satisfied to purchasing the milk from the dairy farm.

### **7.3.2 Dairy farm to retailer to consumer**

The retailers were link in the marketing of dairy milk. They were specialized sellers who were directly connected with the consumers. They generally purchased milk from dairy farmers and sell to the customer. Most of the retailer had no permanent shop usually use home delivery. They locally named goyal. They play an important role in dairy milk production from farm to customer.

### **7.3.3 Dairy farm to milk processor to consumer**

Sweet shoppers normally purchased raw milk from dairy farm and sold purchased milk or dairy milk products e.g. sweets, yogurts, ghee, etc. to the ultimate consumers. For processing activities they had to purchase large volume of milk at lowest possible prices from dairy farmers or wholesalers. Due to processing activities they had to face few processing cost. To get a profit margin they sell processed milk or sweet products at a high price relatively.

## **7.4 Way for entrepreneurship development:**

### **7.4.1 Value addition**

Value addition in milk is an important factor for development of entrepreneurship opportunities in dairy farming. Demand for value added milk products is increasing day by day with increase in purchase power and health consciousness in all sections of our country. Sweet, yogurt, ghee etc. are value added product from milk. It is a big opportunities for dairy farmers to increase their profitability by adding value in milk. So, considering huge opportunity for entrepreneurship development through value added milk products in rural as well as urban area in the study area.

### **7.4.2 Creating farmers groups**

Creating farmers group is also an important factor for development of entrepreneurship opportunities in dairy farming. By creating farmer's group, farmers get various kinds of help from the group. The farmers group also solve the various kinds of problem faced by the dairy farmer. A strong organized farmers group can build a good relationship among dairy farmers. To get actual price of milk and a strong market channel is

possible by this group. So, considering huge opportunities for entrepreneurship development creating farmers group in the study area.

### **7.4.3 Connecting with milk industries**

Connecting with milk industries is another important factor for development of entrepreneurship opportunities in dairy farming. Dairy farmers cannot produce a huge production of milk due to the lack of market. If they connect with milk industry like Milkvita, Pran, Arong etc. they will get a strong milk market. It has a big opportunities for dairy farmers to produce huge milk production. So, considering huge opportunities for entrepreneurship development connecting with milk industries in the study area.

### **7.4.4 Cattle feed Production**

- a) Quality fodder increase the yield of and fat content in milk. To improve milk productivity of improved breeds of cattle, it is important to feed them a balanced diet with sufficient nutrients.
- b) In Dinajpur, rice straws and natural grass constitute traditional feeding of dairy cattle supplemented with a little or no concentrates.
- c) Commercial cattle feed produced feed produced from agro-industrial wastes and by-products, herbal feed additives, concentrates and other nutrient supplements present potential investment opportunities.

### **7.4.5 Cold Chain**

- a) Milk a highly perishable item. In a country like Dinajpur with high ambient temperature, pasteurized milk can only be marketed with cold chain support. Lack of cold chain limits the scope of marketing pasteurized milk only to urban areas. Cold chain in Dinajpur are used mostly for storing potato and have inadequate space and facilities for milk preservation.
- b) Dairy producers require pre-cooling facilities near dairy farms, and reefer truck to transport dairy products from collection centers to the centrally located cold storage, to processing plants and finally to retailers.
- c) The Board of Investment (BOI) of Bangladesh has identified cold storage as a special opportunities for further investment.

#### **7.4.6 Artificial Insemination (AI)**

- a) Artificial insemination is a technique to bring about genetic improvement in farm animals.
- b) Majority of the AS are performed by the Department of Livestock Service of the Government of Bangladesh and also by BRAC, a non-profit organization.
- c) About 2.5 to 3 million cows are naturally breed which presents an untapped investment opportunity.
- d) AI projects are generally implemented by trained AI workers who provide door-to-door service with supplied semen.

#### **7.5 Conclusion**

This chapter was discuss about the supply chain and entrepreneurship opportunities of the dairy farming. There was a huge opportunities for the dairy farming for income generating from various source.

# CHAPTER-8

## CONSTRAINS AND PROBLEM RELATED TO DAIRY FARMING

### 8.1 Introduction

This chapter will discuss about Constrains and problem related to Dairy Farming faced by small dairy farmers.

### 8.2 Constrains faced by dairy farmers

#### 8.2.1 Water problem

Water is not a major problem for the dairy farming in Dinajpur district according to the most of the respondents. Water problem was general to 37 respondents and their percentage was about 92.5%. Problem was felt as tolerable by 3 respondents and their percentage was about 7.5%. And there was no respondents who felt water problem is acute problem. (Table 8.2.1)

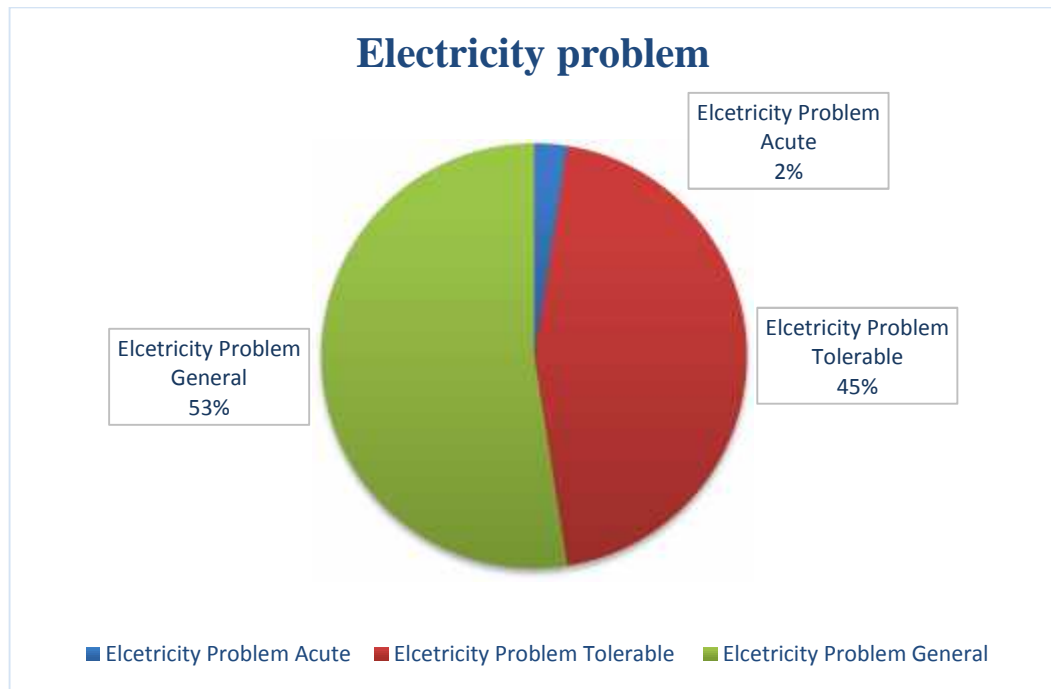
**Table-8.2.1 Water problem of the sample farmers**

<b>Problem level</b>	<b>Farmers</b>	<b>Percentage</b>
Acute	0	0
Tolerable	3	7.5
General	37	92.5
<b>Total</b>	<b>40</b>	<b>100</b>

**Source:** Field Survey, 2019

#### 8.2.2 Electricity problem

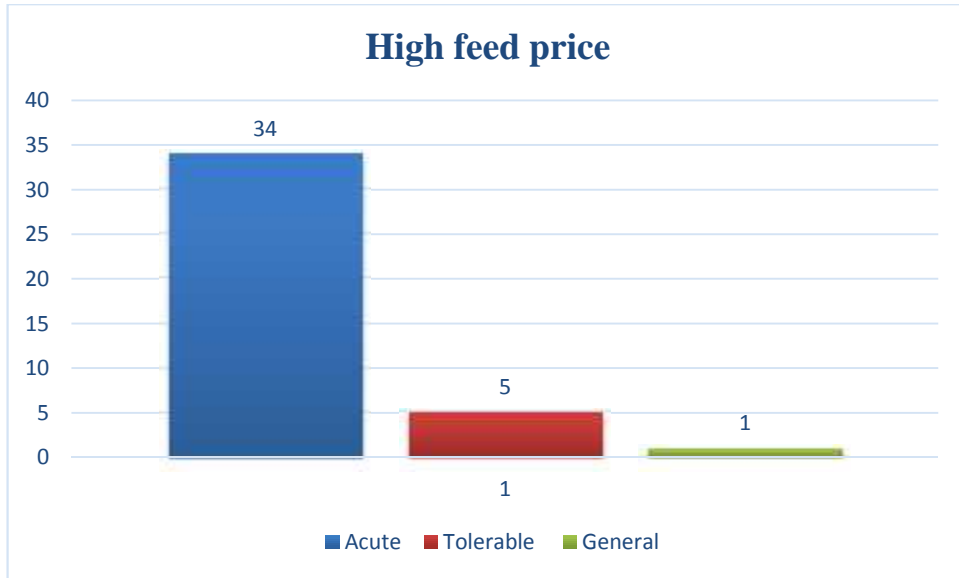
Electricity is essential part for dairy farming. Because most of the dairy farmers have foreign cow or foreign breed. Foreign breed can't tolerate very hot and very cold weather. Water pump, fan, light was indispensable every moment. Load shedding is very common in Dinajpur district. Study area was beyond this problem according to result of this analysis. Highest percent (about 53%) of respondents or farmers answered it as general problem. About 45% of respondents answered it as tolerable and 2% respondents felt this problem as acute. (Figure 8.1.1)



**Figure-8.1.1 Percentage of Electricity problem of sample farmers**

### 8.2.3 High Feed price

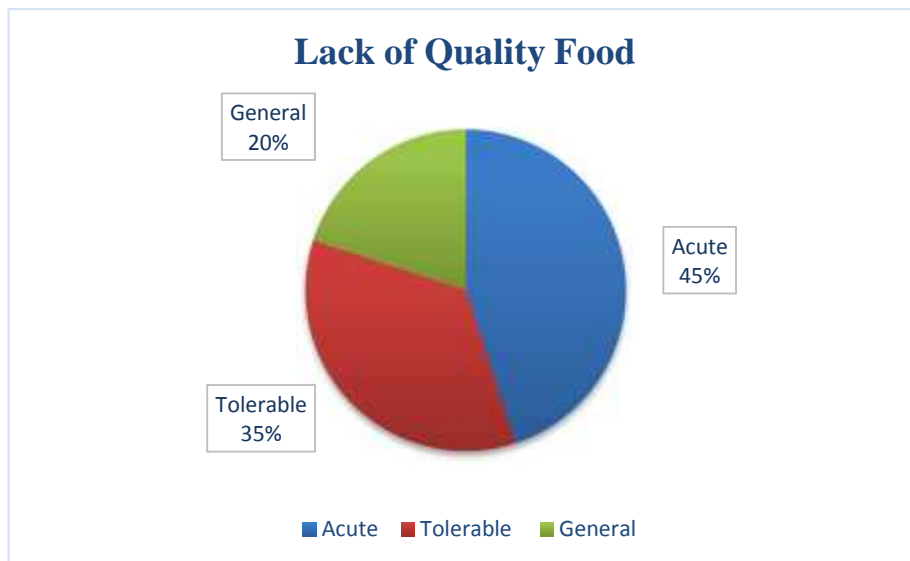
Food is the vital source for increasing milk production of dairy farm. Day by day price of feed is increasing. Most common problem faced by small dairy farmers was respondent as high feed cost. Scarcity of feed was also a major reason for higher price. Most of the farmer said that minimum profit was the result of high price. Many farmers have decided to close their farm due to high feed cost. Out of 40 farmers about 85% of farmers were perceived it as acute problem. However this problem as tolerable as 12.5% and general as 2.5% of the farmers. The result was shown Bar-diagram below (Figure 8.1.2)



**Figure-8.1.2 Percentage of high Feed price**

#### 8.2.4 Lack of quality food

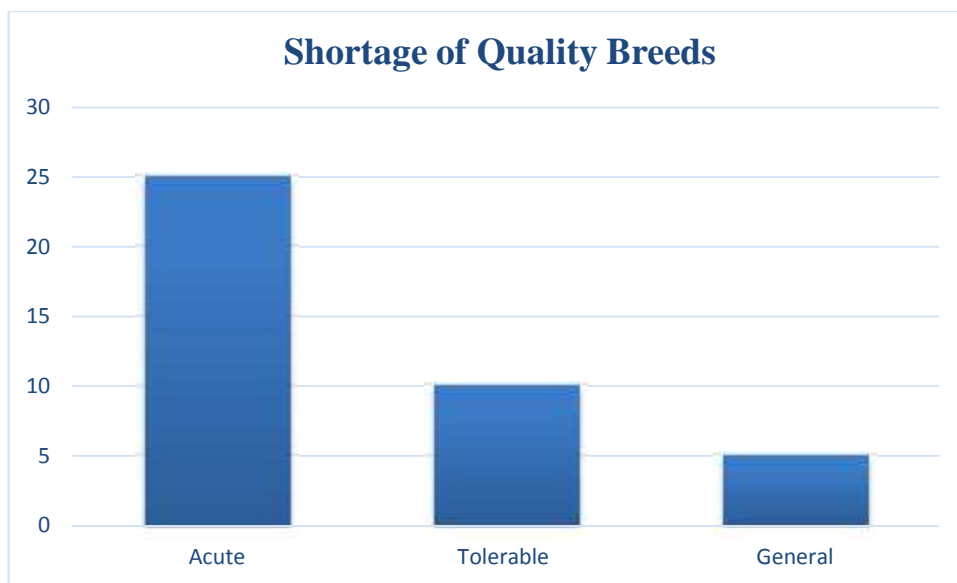
Lack of quality food is one of the main problem in dairy sector in Bangladesh. Few years ago, availability of quality feed for dairy production was a dream. Now-a-days it is one of the major problem in the study area. Out of the 40 farmers of the study about 45% respondents felt acute in quality food. About 35% of respondents felt tolerable and about 20% of respondents was general in lack of quality food problem. The result shown through by Pie-chart. (Figure 8.1.3)



**Figure-8.1.3 Percentage of lack of quality food problem**

### 8.2.5 Shortage of Quality Breeds

The main problem of dairy development is its very low production and productivity. Breeding is the major technological improvement process in the dairy industry. Bangladesh govt. has started artificial insemination program in some area. Shortage of quality breeds is one of the major problem in the study area. About 62.5% of the respondents had reported shortage of quality breeds is acute problem .About 25% of respondents had reported it is tolerable and only 12.5% respondents was satisfied with quality breeds. The result shown in Bar-diagram below (Figure 8.1.4)



**Figure-8.1.4**Percentage of Shortage of quality breeds

### 8.2.6 Lack of Training

Training facility of dairy farming is very important in the perspective of Bangladesh. Few days ago, most of the farmers were not well trained. They had to depend on their indigenous farming experience. But the scenario has changed nowadays. Lack of training has increased today. About 55% respondents were well trained dairy farmer. Only 20% farmers faced acute problem of lack of training. And 25% of respondents faced tolerable problem of training facility of dairy farming. These value was shown below in tabular form. (Table 8.2.2)



**Table-8.2.2: Lack of training problem of the sample farmers.**

<b>Problem level</b>	<b>Farmers</b>	<b>Percent</b>
Acute	8	20
Tolerable	10	25
General	22	55
<b>Total</b>	<b>40</b>	<b>100</b>

**Source:** Field Survey, 2019

### **8.2.7 Lack of Medical facilities**

Diseases and parasites were a major problem for the dairy industry in Bangladesh. Now the medical facilities are not poor at district and Thana level livestock offices. The prices of essential animal drugs are high but farmers have available access to medical facilities. From this observation, highest percent (about 62.5%) of respondents of farmers were answered it was not problem at all. Problem were felt acute by about 25% farmers and 12.5% of farmers felt tolerable condition of lack of medical facilities. These value was shown below in tabular form. (Table 8.2.3)

**Table-8.2.3: Lack of medical facilities problem of the sample farmers.**

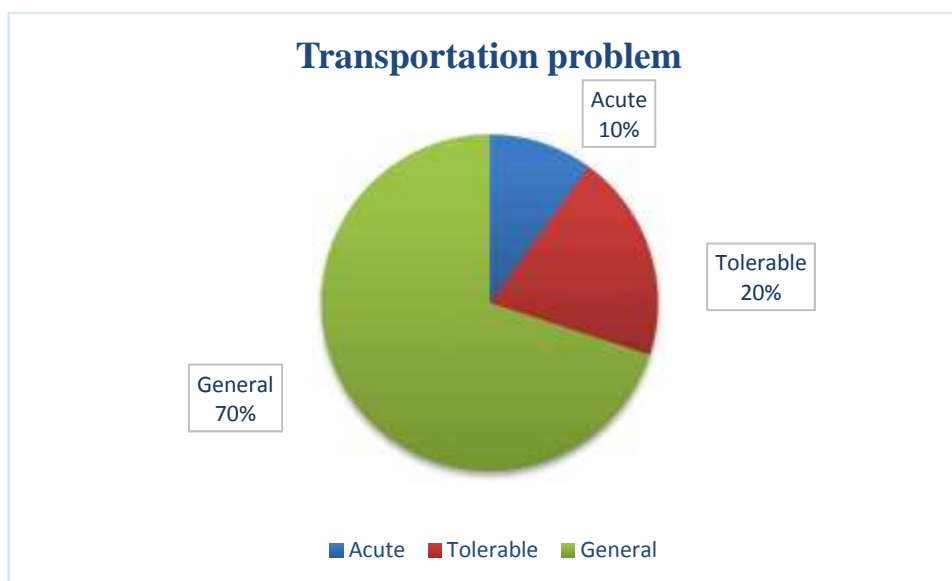
<b>Problem level</b>	<b>Farmers</b>	<b>Percentage</b>
Acute	10	25
Tolerable	5	12.5
General	25	62.5
<b>Total</b>	<b>40</b>	<b>100</b>

**Source:** Field Survey, 2019

### 8.3 Constrains of selling milk

#### 8.3.1 Problems of Transportation

Through transportation is a great problem for small dairy farmers in rural area, it is a negotiable problem in urban area. Most of farmers were satisfied with the transportation system in Dinajpursadar district for their business. About 70% farmers were happy with transportation. And 10% of farmers were unhappy with transportation system. This result shown in Pie-chart below. (Figure 8.1.4)



**Figure-8.1.4 Percentage of transportation system faced by farmers**

#### 8.3.2 Scarcity of Market

Market is a place where a farmer selling their milk. Number of market is scare then price is uncertain/unstable. Scarcity of market was a tolerable problem to most of the farmers. Highest percent (about 45%) of the farmers answered in this way. The lowest percent (about 20%) of respondents or farmers answered as it was acute problem and about 35% of respondents felt it as a general problem. (Table 8.2.4

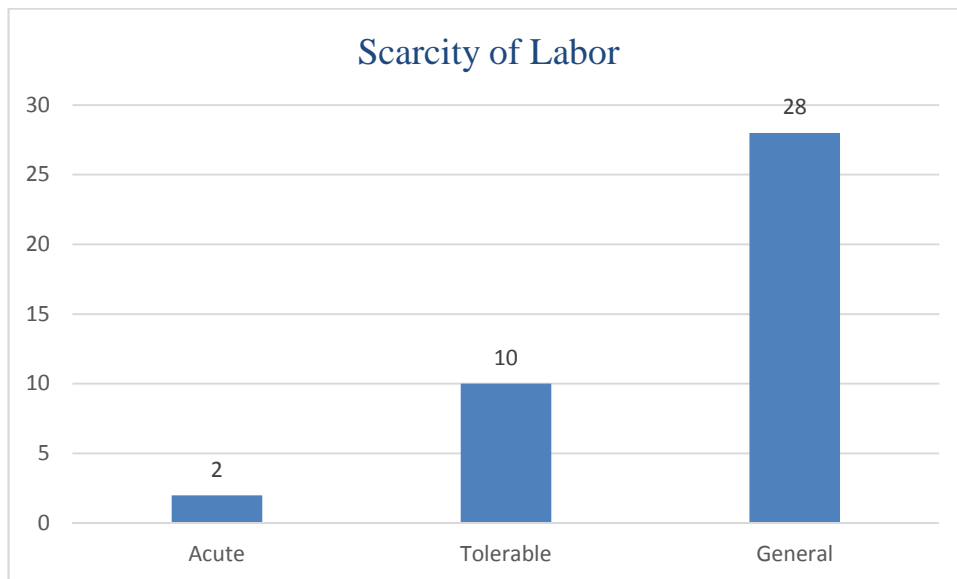
**Table-8.2.4 Scarcity of market of the dairy farmers**

Problem	Farmer	Percent
Acute	8	20
Tolerable	18	45
General	14	35
<b>Total</b>	<b>40</b>	<b>100</b>

Source: Field Survey, 2019

### 8.3.3 Scarcity of Labor

Labor is the main driver in dairy farming sector. With rapid industrialization migration of labor from farm sector it is most common. In the study area about 70% of respondents answered scarcity of labor is general problem. About 25% of respondents answered it is as tolerable problem and 5% of the respondents answered scarcity of labor is acute problem. These value was shown in Bar-diagram below. (Figure 8.1.5)



**Figure-8.1.5 Percentage of scarcity of labor in dairy farming**

### 8.3.4 Lack of Processing technology

Due to the extremely perishability and bulky, availability from widely scattered rural sources, milk collection, processing and distribution methods required to be efficient. The marketing system thus links the milk producers to consumers in wide range of areas. Lack of adequate processing plants is another constrain to the efficient and profitable working of dairy enterprise. About 80% of farmers reported this problem as a major one.

### 8.4 Conclusion:

The above mentioned problems and constrains, of course, are interrelated with one another hence, need to be removed comprehensively through an integrated program for the overall development of dairy farming. Problems faced by the farmers were ranked on the basis of corresponding percentages. Most of the farmers were reported that high feed price, lack of quality food, shortage of quality breed were the major problem.

## **CHAPTER-9**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **9.1 Introduction**

Dairy sector provides a source of livelihood through tradition practices for thousands of dairy farmers of Bangladesh. This chapter provides the summary in the light of results made in the previous sections. Policy recommendations are provided for betterment of the existing constrains of dairy milk production in selected area. Summary of the major findings of the study, conclusion, policy recommendations, limitation of the study and scope for the further research are given in following sections chronologically.

#### **9.2 Summary**

Agriculture is the key driver of the growth of Bangladesh economy. The economic development is inevitably linked with the performance of this sector. Dairy sector is the most prominent contributors in agriculture and total GDP of the country, indirectly the overall growth and development of the economy. The performance of this sub sector has a significant impact on major macroeconomic goal like generation of employment, alleviation of poverty, human development, food and nutritional security. Due to high elasticity of demand for milk in both rural and urban areas and there is a huge deficiency milk production relative to aggregate demand.

Agriculture provides employment to nearly 40.60% of its total labor forces (GOB 2019). Agriculture occupies the main position in the overall economic development of the country in terms of its contribution to Gross Domestic Product (GDP). Broad agriculture sector which includes crops, livestock, fisheries and forestry contributes 13.60 percent to the gross domestic product (GDP) as a whole in the FY 2018-19 (BOS 2019). The contribution of livestock sub-sector to GDP is 1.47 percent in FY 2018-19. Share of Livestock in Agriculture GDP (2018-19) 14.54%.

Traditionally, dairy milk is a year round production. Recent total demand for milk 152.02 Lakh Metric Ton and total production 99.23 Lakh Metric Ton. Production deficiency of milk is 52.79 Lakh Metric Ton. A huge investment opportunity present in

this sector. Large scale research is inevitable to increase the productivity of milk, which is mostly sourced from dairy sector.

Considering this situation, few specific objectives of the study were taken to assess the productivity of dairy milk production in few selected areas in Dinajpur district. The objectives of the work were as follows:

1. To determine the socio-economic characteristics of dairy farmers in Dinajpur district.
2. To calculate the profitability of dairy farming in the study area.
3. To analyze the correlation coefficient that significantly influences profitability of dairy milk production in the study area.
4. To determine the supply chain and entrepreneurship opportunities of dairy milk production in the study area.
5. To identify the problems and recommend policy reform options to improve dairy farming.

The sampling frame for the present study were selected purposively as to select the area where there were high demand for raw milk and dairy products and also have potentiality to increase the productivity. On the basis of higher production of dairy milk, fifteen villages from sadarupazila of Dinajpur district eg. Balubari, Borogurgola, Borobandor, Baluadanga, Daptoripara, Pulhat, Rajbari, Gunjabari, Shikdarhut, Goshapur, Noyonpur, Ramnagar, Kalitola, Newtown were selected for the study.

Data for the present study were collected during the period from August 10 to October 20, 2019. Primary data were collected from dairy farmers. Selected respondents were interviewed personally with the help of pre-tested semi structured questionnaires. The collected data were checked and verified for the sake of consistency and completeness. Editing and coding were done before putting the data in application software. Collected data were summarized and examined sincerely to avoid all possible errors. Socio-demographic condition of sample farmers in terms of family size and household earning members, educational qualification, professional distribution, earning members of family, type of dairy farm, source of farms production capital and initial investment.

About 50% of total respondents belonged to the group 35-45 years old. The highest proportion of respondents depends on dairy farming and the percentage was about 60%. Most of the farmers were literate, accurate percentage was calculated among them. The highest average proportion, about 37.5% of the total farmers was estimated for class 6-

10 and 25% respondents have hon's or above degree. About 35% of respondents have 5 family members. The highest proportion of family members had only income earner and the percentage of their number was about 52%.From, this study the highest proportion of family had three educated members and the percentage was estimated about 37.5% and the lowest was estimated by six persons which was 2.5%.From, this study the highest proportion of family had three educated members and the percentage was estimated about 37.5%. It was observed that most of the dairy farm was establish with own finance, the percentage was about 95%.For establishing dairy farms, about 72% depend their own source for capital.

Economic profitability is a critical criterion to make any investment decision at dairy farm. It can be measured based on net return, gross margin, and ratio of return to total cost. The average variable cost of dairy milk production per cow per day was found to be Tk. 217.62. The average human labor cost in dairy milk production was found to be about 23.15 Tk. per cow per day. Average cost per cow per day of cow feed for dairy milk production was estimated to be Tk. 179.47. On an average, farmers used straw, green grass or napier grass, rice dust, oil cake, mineral mix, wheat husk, khesari husk, soya bean meal, broken rice as feed for cow. The average cost of doctor and medicine 9.08 Tk. per cow per day whereas the average cost of electricity was found Tk. 4.22 per cow per day. The average yield of dairy milk per cow per day was 9.5 liters and the average price of milk was 50 Tk. per liter. The gross return, gross margin and net return were found to be Tk. 567, Tk. 349.48, Tk. 318.27 per cow per day respectively. Benefit cost ratio (BCR) was found to be 2.28 which implies that one taka investment in dairy milk production would generate Tk. 2.28

The multiple regression coefficient model was used for technical inefficiency. The profit was measured as independent variable. Family member, education, training, age, experience, number of cow was measured as dependent variables. The regression coefficients of family member, education, training, age, experience, number of cow increased by one unit, the profitability of dairy farmers would increase by 0.030, 0.218, 0.041, 0.040, 0.225, 0.632 units respectively.

Dairy farmers faced a lot of problems in dairy milk production. The problems were social and cultural, financial and technical. High feed price was one of the most important limitations of dairy milk production in the study area. Electricity problem,

High feed price, Lack of quality food. Shortage of quality breeds, Lack of training, problems of transportation, Lack of storage capacity are the major problems faced by dairy farmers. These are the major constrains for the dairy farmers in the study area. Public and private initiative should be taken to reduce or minimize these problems for the sake of better production of dairy milk production.

### **9.3 Conclusion**

Based on the results of the study it may be concluded that dairy industry is profitable enterprise, though this enterprise faces many constrains for it rapid development and growth. The demand for milk in the urban areas is very high and dairy owners cannot fulfill the demand for milk with their limited milk production. If proper remedial measures could be taken, dairy farming could be a viable commercial enterprise which in turn could play a vital role to overcome the problems of low income, unemployment, under nutrition and unfavorable balance of payment situation of the country especially for the northern region. The study also revealed that, rearing of cross breed cows was more profitable than local breed cows. To overcome the difficulties of raising dairy farms and to make milk production and marketing more profitable in the country, a set of recommendations are put forward.

### **9.4 Recommendations**

A dairy farming is a profitable enterprise, national dairy policy should be formulated to help in increasing awareness among small producers about the possibilities of remunerative market access through collective or group action and at the same time take regulatory measures to provide incentive and encouragement to processing enterprise to ensured that they create an environment for wide participation of small producers in their business activities.

The following recommendations are made for sound dairy development in the study area:

- i) The government should emphasize on electricity problem in the study area for dairy activities.
- ii) As most of the dairy farmers are quite efficient at present production technology, reduction of feed cost will help them in increasing their farming enterprise.

- iii) The government should provide necessary assistance for establishment of feed mill for making quality feed available in the market in northern region.
- iv) The government should provide availability of quality breeds for improving dairy production.
- v) The government should emphasize on education and manpower training in dairy activities.
- vi) The Department of Livestock Services (DLS) should take steps to issue veterinary card to the registered dairy farmers to ensure timely supply of veterinary services and medicines at reasonable cost.
- vii) Milk marketing facilities should be improved either by establishing milk processing by organized marketing bodies
- viii) Government should provide assistance to establish more milk processing plants in the northern region.
- ix) Subsidies for technology adaptation in processing of dairy products should be given to farmers for encouraging the private investors to make further investment in this sector.
- x) Credit facilities should be enhance from both private and government institutions on easy terms and conditions for milk producers and market actors.
- xi) Policy regarding the establishment of Bio-gas plant in every farm will increase the net profit of dairy farmers and also helps to reduce the extensive use of natural gas.

### **9.5 Limitations of the Study**

Some limitations were faced during study as the study was conducted on the dairy farmers through face to face interview.

- Most of the data were collected through interview of the dairy farmers and sometimes they were not interested to respond.
- Resource and time constraints were most important barrier in data collection. As a result broad and in-depth study was hampered to some extent.
- The information collected mostly through the recollections of the farmers which were not always accurate.



## **9.6 Avenues of Further Research**

The limitations of study indicated some new scope of research which might be undertaken in the context of Bangladesh. Due to limitations of time and resources this study could not cover some important areas these are discusses below.

- The present study was conducted only 15 villages of Dinajpur sadar upazila region. A similar study could be conducted covering various geographical regions of the country and a cross country comparisons could be performed to measure comparative advantage of dairy farming.
- The present study analyzing the profitability, supply chain and entrepreneurship opportunities of dairy milk production in Dinajpur district. So there is an ample opportunity to conduct study on resource use efficiency of dairy farming.
- The study of comparative productivity and profitability of different breeds may be conducted.

## **CHAPTER-10**

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# CHAPTER-11

## APPENDIX

### QUESTIONNAIRES FOR SAMPLE FARMERS, DEPARTMENT OF AGRIBUSINESS & MARKETING, SHER-E-BANGLA AGRICULTURAL UNIVERSITY

#### Information of respondent:

Name :..... Village :.....

Union :..... Upazilla :.....

District :.....

#### 1. Socio-economic information:

<b>Gender</b>		Male=1, Female=2
<b>Educational qualification</b>		Class 1-5=1, Class 6-10=2, Class 11-12=3, Hon`'s and above=4, Illiterate=5
<b>Profession</b>		Farmers + Dairy=1, Dairy businessman=2, Farmer + Business=3, Job + Dairy= 4

<b>Age</b>	<b>Member of family</b>	<b>Earning member of family</b>	<b>Educated member of family</b>

#### 2. Type of Dairy farm:

	<b>Ancestor farm=1, Own=2, Partnership farm=3</b>
<b>Type</b>	

#### 3. Farm size based on number of cow:

	<b>Number</b>
	1-10 cow=1, 11-20 cow=2, 21-30 cow=3, 31-40 cow=4, 41-50 cow=5, 50-75 cow=6, 76-100 cow=7, Above 100 cow=8
<b>Answer</b>	

**4. Source of farm`s production capital:**

Source
Own=1, Bank loan=2, Own + Bank loan=3 others=4

**5. Initial investment and Year to establish?**

Year	Amount
	0-30k=1, 31k-50k=2, 51k-75k=3, 76k-1Lakh=4, 1-2 lakh=5, 2-5 lakh=6, 5-10 lakh=7, above=8

**6. Do you have loan from Bank for opening the dairy farm? Yes=1, No=0**

Answer :.....

**7. Do you have any specialized training about dairy farming? Yes=1, No=0**

Answer :.....

If Yes, Mention that.....

**8. Do you have any license for running the Dairy farm? Yes=1, No=2**

Answer :.....

If Yes, From where you get license .....

If No, Do you know what are the procedure about that .....

**9. Help from Government for Dairy farm management? Yes=1, No=2**

Answer :.....

**10. How many workers work in the farm?**

	Number
	1-5 person=1, 6-10 person=2, 11-20 person=3, 20-30 person=4, Above 30=5
Answer	

**11. Cost of the Dairy Farm:**

**a) Fixed cost:**

Items	Cost (Taka) / Month
Land rate	
Depreciation and maintenance of building and equipment	
Property tax	
Interest (if loan from Bank)	
Electricity bill	
Water bill	
<b>Total</b>	



**b) Variable cost:**

<b>Items</b>	<b>Cost (taka)/ Month</b>
<b>Food</b>	
Straw	
Green grass	
Rice dust	
Molasses	
Oil cake	
Wheat husk	
Mineral mix	
Pulse husk	
Broken rice	
Soya bean mill	
<b>Labor</b>	
Family labor	
Day labor	
Monthly wage labor	
<b>Medical</b>	
Medicine	
Doctor	
<b>Transportation Cost</b>	
<b>Total</b>	

**12. Farms dairy production cost:**

<b>Types of dairy cow and calf</b>	<b>Number</b>	<b>Purchasing price (Dairy cow with calf)</b>	<b>Average milk production per day in 8 month (Liter)</b>	<b>Average milk production per day in 4 month (Liter)</b>	<b>Selling price (Dairy cow/Reject cow)</b>

13. Number of Milk producer cow.....

14. Daily information selling of milk:

Daily production of milk	Neighbor		Goala		Bazar		Sweet shop		Wholeseller	
	Amount(Liter)	Price(Tk/Li)	Amount(Liter)	Price(Tk/Li)	Amount(liter)	Price(Tk/li)	Amount(liter)	Price(Tk/li)	Amount(Liter)	Price(Tk?Li)

15. Income from farm last year:

Sell of	Number/Amount	Price
Dairy cow		
Calf		
Bokna		
Cow dung		

16. Milk marketing cost:

Instrument cost	Number/Amount	Cost (Tk)
Packaging cost		
Labor		
Polythene		
Transportation cost		
Container		
Bazar Toll		
Storage cost		
Other cost		

17. Problem of Dairy farm:

Serial number	Problems	Degree of problem Acute=1, Tolerable=2, General=3
1	Water problem	
2	Electricity problem	
3	High feed price	
4	Lack of quality food	
5	Shortage of quality breeds	
6	Lack of training	
7	Lack of medical facilities	

**18. Problems of selling milk:**

<b>Problems of milk production</b>	<b>Degree of problems</b>
	<b>Acute=1, Tolerable=2, General=3</b>
Problems of transportation	
Scarcity of market	
Scarcity of labor	
Lack of processing technology	

