



**SOCIO-ECONOMIC PROFILE OF GOAT REARING  
FARMERS AND THEIR MANAGEMENT PRACTICES IN  
KHAGRACHHARI DISTRICT, BANGLADESH**

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Roll No: 120/03

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**A thesis submitted in the partial fulfillment of the requirements  
for the degree of Master of Science in Agricultural Economics**

**Department of Agricultural Economics and Social Science**

**Chattogram Veterinary and Animal Sciences University  
Chattogram-4225, Bangladesh**

**January 2023**

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**Ashik Hazra**

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This is to certify that we have examined the above Master's thesis and have found that is complete and satisfactory in all respects, and that all revisions required by the thesis examination committee have been made.

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**January 2023**

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## ABSTRACT

The goal of the study was to describe the traits of farmers in the Khagrachhari district who raise goats and their methods for managing those animals. For the study, the researchers chose 150 goat-rearing farmers at random from three upazilas in Khagrachhari. According to the findings, a sizable percentage of the respondents were middle-aged (64.67%), had just a primary education (30%), and belonged to large families (56.67%). The majority of farmers (50%) were workers, and 86.67% of them were married. In order to start their goat-rearing businesses, more than a third of the farmers—who lacked access to land—took 100% loans from NGOs rather than using their own funds. A platform above the floor was absent from half of the goat huts, which were constructed of tin. Under a free-range system, around one-third of the farmers (36%) allowed their goats to graze on natural fodder (62.67%) and fed them wheat bran (52.67%) as a concentrate. In the region, Black Bengals were the most popular breed. Just 20% of farmers consistently vaccinated their goats, and only 23.33% regularly used anthelmintics. The majority of farmers (66.67%) only had a basic understanding of goat illnesses. The main source of technical assistance was the local veterinary doctors. In addition, 53.33% of farmers disposed of the placenta outside, while 90% buried the goat's deceased carcass.

**Keywords:** *Goat farming, Socioeconomic profile, Goat management, Livelihood, Smallholder farmers, Goat breeds.*

## TABLE OF CONTENTS

<b>CHAPTER 1</b> .....	<b>1</b>
<b>INTRODUCTION</b> .....	<b>1</b>
1.2. Justification of the Study.....	5
1.3. Objectives of the Study .....	6
<b>CHAPTER 2</b> .....	<b>7</b>
<b>LITERATURE REVIEW</b> .....	<b>7</b>
2.1. Socioeconomic Background of Goat Production in Bangladesh.....	11
<b>CHAPTER 3</b> .....	<b>13</b>
<b>METHODS AND MATERIALS</b> .....	<b>13</b>
3.1 Study Area.....	13
3.2 Sampling Technique .....	13
3.3 Data Collection .....	14
3.4 Data Analysis Technique .....	15
<b>CHAPTER 4</b> .....	<b>16</b>
<b>RESULTS AND DISCUSSIONS</b> .....	<b>16</b>
4.1. Socio-economic conditions .....	16
4.1.2. Age of the farmers .....	17
4.1.3. Education.....	17
4.1.4. Family size .....	18
4.1.5. Main occupation .....	18
4.1.6. Marital status .....	19
4.1.7. Farm size .....	19
4.1.8. Source of investment .....	19
4.1.9. Annual income .....	19
4.2. Management Practice .....	20
4.2.1. Housing system and house cleaning.....	20
4.2.2. Macha .....	20
4.2.3. Ventilation .....	20
4.2.4. Cleaning regularly .....	20
4.3. Goat Feeding Management .....	21
4.3.1. Sources of feed .....	21
4.3.2. Fodder Source.....	21

4.3.3. Concentrate Feed .....	22
4.3.4. Provision of Drinking Water in the Shed .....	22
4.4. Breeds.....	23
4.5. Control of Disease in Farm .....	23
4.5.1. Idea about Disease.....	23
4.5.2. Vaccination and Vaccine Source.....	24
4.5.3. Anthelmintic.....	24
4.5.4. Veterinary Services .....	25
4.5.5. Disposal of Dead Body and Placenta .....	25
4.6 Assessment of Farm Profitability.....	27
4.6.1 Estimation Cost per Goat According to Goat Rearing Farmers.....	27
4.6.2 Estimation of return per goat According to Goat Rearing Farmers .....	27
4.6.3 Estimation of Per Goat Cost And Return .....	29
<b>CHAPTER 5.....</b>	<b>30</b>
<b>CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>30</b>
5.1 Conclusions .....	30
5.2. Recommendations .....	30
<b>REFERENCES .....</b>	<b>32</b>



## LIST OF TABLES

<b>Table No.</b>	<b>CAPTION</b>	<b>PAGE No.</b>
4.1.	Demographic conditions of respondents	17
4.2.	Households System	23
4.3.	Goat Feeding Management	25
4.4.	Breeds found in study area	26
4.5.	Prevention And Control of Diseases In Farmhouse	25
4.6.	Cost Estimation And Profitability Per Goat For Goat Raising Farmers (N=150)	31

## LIST OF FIGURES

S.L. NO.	CAPTION	PAGE NO.
3.1.	Khagrachhari District	12
4.1	Per goat cost and return	32

## LIST OF ABBREVIATIONS

GDP	Gross Domestic Product
FAO	Food and Agriculture Organization
DLS	Department of Livestock Services
MDGs	Millennium Development Goals
LMICs	Low-To Middle-Income Countries
PPR	Peste des petits ruminants
BBS	Bangladesh Bureau of Statistics
GO	Government Organization
NGO	Non-Government Organization
BBG	Black Bengal Goat
EXCEL	Experiential Curriculum for the Enhancement of Learning

# CHAPTER 1

## INTRODUCTION

### 1.1 Background of the Study

Bangladesh is one of the poorest and most populous countries in the world, with around 169 million people living in an area that is just 144750 square kilometers in size. The country has a per capita yearly income of USD 2973, and approximately 49.47 percent of its population is female (Economic Review, 2022). In terms of the production of meat, milk, and skin, the goat comes in at a respectable second place in Bangladesh, providing around 38.0%, 23.1%, and 28.0% of all livestock, respectively (FAO, 2010). Because it is widely recognized as a renewable resource for the underprivileged and because it was one of the first agricultural animals to have been closely related to humans for a very long time, the goat is frequently referred to as the "poor man's cow." This is since the goat has been closely associated with humans for a very long time. Its production, size, and food quality have proven valuable to humans over time (Aziz, 2010).

Underprivileged farmers in Bangladesh keep goats as a supplementary source of income. Aside from business endeavors, goat farming contributes a substantial percentage of the family's revenue (Sarker and Islam, 2011). Goats are classified as a separate species in livestock production due to their economic importance, position in related sectors, and exploitation potential (Devendra, 1980). According to data given by the Department of Livestock Services in 2015, there were around 257,666,000 goats in the nation in 2015.

The Department of Livestock Services (2015–2017) estimates that there are 257.66 lakh goats in Bangladesh, and these goats contribute to the entire livestock meat output of the nation (61.52 Lakh Metric Ton). Herding goats is one of the primary occupations for 36% of all farming households in Bangladesh, which contributes to the country's high poverty rate (45% of the population is considered to be living below the poverty line). Goat husbandry is also one of the most common occupations in Bangladesh (BBS, 2014). Due to the development of new agricultural methods including goat and poultry farming,

household farming, crop and animal agriculture, the situation presently appears to be drastically altering. It took a long time for it to become evident, and only recently has it come up in conversations about development plans. Different government and non-government organizations are now approaching rural women to provide credits and technical support services to increase their family incomes and self-reliance. On the other side, it is important to identify working spaces so they may increase their involvement in agricultural output. Appropriate intervention is crucial for increased goat productivity and marketing. Data regarding the present goat production and management system is required to meet these goals (Assan, 2014, Kosgey et al., 2008).

In developing nations, particularly those in Asia and Africa, goats are a very valuable and promising animal resource both numerically and commercially (Husain, 1993). Raising goats could help fight poverty and advance gender equality. For smallholder farmers, poultry and small ruminants are economically significant. Small ruminants are thought to be especially significant for landless people because of the tendency for the overall revenue share of small ruminants to be inversely proportional to the amount of land holding. Since agriculture only offers temporary jobs, raising this animal would serve as a secondary vocation that offers year-round work and money. A combination grazing and cut-and-carry feeding strategy has shown that a moderately sized goat given to a farm family in need can readily sustain themselves. In Bangladesh, it is an essential component of many farming techniques.

The Black Bengal Goat is widely considered to be one of the most important livestock animals in Bangladesh. For those who are impoverished, it is a significant source of income. Typically, goats are farmed with very minimal financial input by struggling mothers and poor farmers. Livestock is an essential component of Bangladesh's mixed agricultural system, which accounts for around 2.90 % of the country's gross domestic product (FAO, 2010). Raising livestock is a significant source of revenue and readily available funds. One of the segments of livestock that has acquired a new dimension is goats. It has become a crucial sector for generating income, creating jobs, reducing poverty, producing food, improving nutrition, and fostering socioeconomic development for rural poor, vulnerable women, and young people without jobs in developing nations like Bangladesh. It also has

important environmental aspects. In developing countries, particularly in Asia and Africa, goats represent a highly significant and promising animal resource both numerically and commercially (Husain, 1993). Goats are stressed for their important contributions of goods like meat and milk, as well as industrial raw materials like skin and dung. They are also emphasized for their social relevance as security via revenue creation and human nourishment (Devendra, 1992; Husain et al., 1998).

It is possible that the goat is the only animal in Bangladesh that's grown for its meat, skins, milk, and feces all at the same time. It is one of the few sources of income for the farmers who are affected by poverty, and it also provides additional income for the farmers who are often found in Bangladesh. It is a substantial source of protein, and the enterprises that revolve around goats may occasionally serve as a stable fund to aid farmers in overcoming unforeseen emergencies that require immediate finance. It is clear that the goat industry has evolved, becoming a crucial sector for income generation, job creation, poverty alleviation, food production, nutrition, socioeconomic development for Bangladesh's rural poor, vulnerable women, and unemployed youth, as well as its significant environmental aspects. Almost "zero input-no maintenance" costs and a small space with little overhead are used to sustain the majority of the goat population in rural locations. Purchasing goats requires less money up front than buying cattle. As a result, raising goats is a simple process for marginal and landless farmers.

The miniature goats known as Black Bengals are renowned for their adaptability, fertility, and prolificacy as well as for their excellent meat, high-quality skin, increased disease resistance, and broad acceptance in a variety of agro-climatic conditions (Devendra and Burns, 1983). Goats may be kept on tree leaves, bushes, and shrubs in the countryside and require less feed than cattle. Goat farming has played a significant part in the production of meat, milk, and hide since prehistoric times. There are around 677 million goats worldwide. 64 percent of them are raised by small and marginal farmers in Asia, 30 percent are in Africa, 3.3 percent are in North and South America, 2.3 percent are in Europe, and 0.4 percent are in Oceania (Chowdhury et al., 2002). In Bangladesh, out of 2 crore goats, 52% were farmed by small-scale, landless farmers. The overall number of goats per rural household in Bangladesh is four, which is equivalent to the Southeast Asian nations of Indonesia,

Malaysia, and Thailand. In some areas of Bangladesh, goat farming accounts for roughly 41% of farm revenue. Additionally, leather is Bangladesh's best-paying export, bringing in an average of Tk. 25 crore annually (Chowdhury et al., 2002) .

The number of goats produced varies around the globe. Goat farming requires a lot less initial investment than cow or buffalo farming because of the lower production costs and smaller size of the goat. As a result, there is a lower chance of loss from individual mortality. Women and children, on the other hand, may readily handle the species on a small farm. Low birth weight, sluggish development, and kid mortality are caused by children's nutritional deficiencies, particularly those caused by prenatal and postnatal mother deficiencies, which lower this species' overall production (Husain, 1993). In rural regions, the leading causes of goat mortality include viral infections such as PPR and Gopher pox, bacterial illnesses such as enterotoxemia, tetanus, brucellosis, and mastitis, and mycotic disorders such as ringworm infection, scabies, and footrot. Rickettial infections like conjunctivitis are another common cause. Less fatalities are caused by GI nematodes, fascioliasis, and tape worms, but their effects on growth and reproduction are severely depressed. The current way of production results in incorrect care as well as generally bad husbandry practices, which leads to a higher death rate for goats (Husain et al., 1995).

Small ruminants, particularly goats, play a significant role in Bangladesh's rural economy, nutrition, and potential for poverty alleviation. According to current knowledge, goats were likely the earliest domesticated animals. 90% of the goats raised there are Black Bengal Goats because of their desirable characteristics (Amin et al., 2001). The primary variables that are directly associated to higher young mortality, such as relatively low birth weight, slow growth, and inadequate milk supply are what lower overall productivity. This is because these characteristics are what cause does to have fewer offspring (Husain, 1993). The time of year in which a child is born, the kind of birth, the birth weight are all significant determinants (Acharya, 1988). Either an intensive or a semi-intensive management style is typically utilized by medium and large-scale farmers who are engaged in commercial goat farming. These methods of raising goats inevitably lead to a high number of illnesses, which in turn reduces the profitability of the farm by driving up the cost of veterinary care. No systematic observations have been made on the occurrence of various diseases, mortality, or other factors associated to child death in Black Bengal Goat farming that is intensive or semi-intensive. This is the case even though these methods are used.

The government of Bangladesh placed a strong emphasis on increasing goat production at the local level due to the contribution that goats provide to both the rural economy and the overall national economy. The Department of Livestock Services (DLS) ran a program in the 1990s to reduce poverty through goat farming, and up to 2005, 9283 troubled families received a total of 262.11 lacks in loans. With the intention of meeting the Millennium Development Goals (MDGs), the government of Bangladesh has, since 2003, placed a particular emphasis on and has been actively implementing a national program on **Black Bengal Goats for Poor Farmers** (Kader, 2006). In addition, the government and several non-governmental organizations (NGOs) have collaborated to establish a Credit and Training Program for Goat Farming. This program is intended to alleviate poverty in the country, particularly among the country's disadvantaged women. People who consume daily calories of less than 2122 kcal and 1805 kcal were classified as moderately and very poor families, respectively, based on their calorie consumption. The determination of a reasonable goatherd size requires only a small amount of work to make goat husbandry profitable for poor, distressed women. The study's findings may be of great use to researchers, policy makers, NGOs, and GOs in understanding the challenges and opportunities of goat farming at the family level in rural areas.

In Khagrachhari, goat farming has developed into a significant source of income for all social classes, either as a primary or secondary activity. Currently, very little information is accessible on the management methods and current state of the farmers. Therefore, the study's goals are to investigate the socioeconomic environment, identify significant barriers to the goat industry, and discover opportunities that may have an influence on goat farmers' ability to produce more with less. The study will aid in determining the needs of goat farmers and in suggesting management improvements to boost goat output.

## **1.2. Justification of the Study**

Vital to the agricultural business, cattle contributes considerably to our GDP. Despite continuing poverty, overpopulation, unemployment, and poor literacy rates, the country's GDP has increased by roughly 5 percent over the previous few decades. Bangladesh continues to get cash through subtropical household cattle husbandry. In addition, it is being used as a strategy for decreasing poverty. Government agencies and NGOs have extensive

livestock farming-based livelihood enhancement projects. To ensure the long-term viability of small-scale livestock farms, it is essential to choose farmers based on their maximal potential to operate a small farm. For each species farmed on a family farm, the manageable herd size must be determined. Animal production is predicated on profitability. Profitability requires that we grasp the greatest farm management strategies. There are sources of initial finance for small-scale farms, but there are also limits. Consider the availability of land, manpower, and operational capital. Based on the available resources and limits, we must optimize farm size to maximize profit and act as a tool for alleviating poverty among moderately and severely impoverished rural families in Bangladesh.

Therefore, the present study is very necessary in order to comprehend the manageability and profitability related to small-scale semi-scavenging goat farming in remote locations. Since there haven't been many studies of this kind on goat farming in this nation, the current study was created to provide a solution to the aforementioned problematic scenario.

### **1.3. Objectives of the Study**

The primary objective of the research is to determine the optimal herd size for goat rearing farmers in a few selected regions. Specific objectives of the research are:

- i. To define the socio-economic characteristics and assess the extent to which impoverished farmers generate revenue.
- ii. To determine the gross characteristics and symptoms of goat rearing practices and management.
- iii. To assess and compare the costs and returns of rural goat rearing farmers.



## **CHAPTER 2**

### **LITERATURE REVIEW**

Livestock is the most promising sector for addressing the issues faced by landless, marginal, and small-scale farmers and assisting in the reduction of poverty (BBS, 2007). Goats can be added to existing sheep and cow grazing operations to increase the farm's economic, environmental, and genetic variety, which has a significant impact on the farm's sustainability (Luginbuhl et al., 1996). To understand the challenges faced by farmers when raising Black Bengal Goats in two upazilas in the Faridpur area, research was conducted to compare the level of problems faced by farmers to the specified characteristics of the farmers. It was found that those who raise Black Bengal goats had the highest proportion of high problems (60%), followed by a quarter of medium problems (25%) and a minor percentage (15%) of low problems (H. Kober, 2005).

Poor marginal farmers retain the majority of the goat population because they lack the resources to keep the animals in separate housing. As a result, goats are typically kept in the open throughout the day. They are often kept in the owner's living room at night (64% of the time). Only 15% of farmers had separate housing for their goats, according to research. Goat housing was inadequately aired, improperly and seldom cleaned, and no special accommodations were made for animals who were pregnant or had recently given birth (Devendra and Burns, 1983), (Smith and Sherman, 1994).

Malnutrition (8.33%), increasing predators (13.88%), mechanical (5.5%), and others (11.11%) were the main causes of child mortality in the 0–3month age group, while infectious causes such as pneumonia, diarrhea, enterotoxaemia, and ecthyma were responsible for 25%, 16.6%, 13.88%, and 5.55% of all child deaths, respectively (Ershaduzzaman et al., 2007). During the dry season (October to March), when there were shortages of green grass in the grazing fields and female goats died significantly more frequently than male goats, the primary cause of death for adult goats (>1 year of age) was most likely enterotoxemia. This was also the case when male goats died significantly more frequently than female goats. The mortality rate for growing goats aged 3 to 12 months was approximately 22%, with diarrhea and pneumonia accounting for the majority of deaths. Mortality rates were highest (nearly 40%) during the hot and rainy season (July to October), and low birth weight had an impact on the observed kid mortality (Ershaduzzaman et al.,

2007). According to Sayeed et al. (2005), treatment of infected goats had no effect ( $p>0.05$ ), despite the fact that death of goats owing to illnesses varied considerably between farm types. The goat was mostly impacted by Hemorrhagic Septicemia (HS), Peste des Petits Ruminants (PPR), Goat Pox, Bloat/Tympany, Parasitic Diseases, and Malnutrition. Goats had a 24% morbidity rate and an 11% death rate, respectively. Peste des Petits Ruminants caused the greatest percentage of deaths (86%) (PPR). The cost of treatment was Tk. 46 per sick goat. Loss of revenue as a result of goat deaths per impacted farm and across all farms was 881.00 and 338.00, respectively.

There were several incidences of dermatophytosis, demodicosis, psoroptosis, sarcoptosis, chorioptosis, trichinellosis, tick infestation, and pediculosis in rural goats. In their investigation, (Donkin and Boyazoglu, 2004) discovered that a three-year span of time had a mean yearly goat baby mortality of 29%. Breed, gender, or multiple births had no discernible impact. Coccidiosis and pneumonia were the two most common causes of goat child fatalities. According to Chowdhury et al. (2002), enterotoxemia was the leading cause of mortality among adult goats. On the other hand, infectious illnesses such as diarrhoea and pneumonia were responsible for the deaths of all of the young goats. According to the findings of the study, pneumonia was the leading cause of death among children (42.39%), followed by diarrhea (32.61%), ecthyma (20.65%), and bloat (4.34%). It is likely that greater stress on animals was the root cause of this higher death rate in semi-intensive rearing systems. As a direct response to this increased stress, animals showed a higher illness incidence and mortality rate. Husain et al. (1995) found that factors contributing to greater infant mortality in the current production method included low birth weight, inadequate milk supply of does immediately following kidding, improper treatment, and general poor husbandry practices. David Mackenzie (1995) found goats were mostly resistant to semi-poisonous plants when given free run and a wide variety of fodder. However, there comes a point when forage is short, or a gate is left unlocked.

Very few farmers provide separate housing for sheep and goats, according to study by Saadullah (1991). They are kept in the homestead's open yard, kitchen, cow shed, hallway, and verandah. According to research, 47% of goats are kept in an open shed, 30% in the cow shed, and the remaining sheep are kept inside. In Andhra Pradesh, Sriram et al. (1982) studied goat mortality and found that enteritis and pneumonia were the leading causes of death.

The impoverished in Bangladesh still choose goats as a farm animal. Farm size varies substantially despite a number of restrictions. No research has been done in that area to date. Yasmin et al. (2007) 's study of the effect of microcredit for poverty reduction through goat husbandry in Narchar, Bangladesh, revealed that the goat population rose by 24.21%, while the populations of chickens, ducks, and cattle declined by 69.68%, 31.09%, and 11.38%, respectively. She also noted that home consumption of milk, eggs, meat, fish, fruits, and power was rising, and she recommended expanding financing opportunities for goat farming in order to reduce rural poverty.

Goats are prolific breeders; twins or triplets are frequently born at kidding. Goat milk cheese is renowned for its high quality around the world. Particularly distinctive around the world is the skin of the Black Bengal Goat (Banerjee, 1980). In 1996, Das focused a socioeconomic study on the Black Bengal Goat in the Bangladeshi district of Mymensingh on 50 randomly chosen farms and found that the annual total cost of production of BBG per household was Tk. 246.20, while the gross return and net return per household were Tk. 880.00 and Tk. 633.80, respectively. From the results, it was clear that small farms had the highest net returns (Tk. 753.53 per farm), while big farms had the lowest net returns (Tk. 166.43 per farm). The author also made recommendations for support services in the form of loans, agricultural extension, training for farmers, goat production, and marketing facilities.

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Research on the socioeconomic factors influencing rural residents of southern Benin who maintain goats and sheep was undertaken Dossa (2008). The author noted that in the research region, there were around 91% goat owners and roughly 37% sheep owners. Seventy-one percent of goat keepers were women.

Hassan et al., (2007) carried out a study to investigate the reproductive and productive performance of Black Bengal Goats that had been grown in a semi-intensive environment. The goats were only allowed to graze once, and the does, bucks, and kids each received a concentrate supplement at a rate of 300, 200, and 100 g/day, respectively.

The Black Bengal Goat was studied for a period of two years, during which time various reproductive and productive characteristics were identified. Young ones are typically reach puberty at weights of 8.08 kg and 209 days and 32 days, respectively. At the first kidding, the average age and weight were respectively 401.532.08 days and 15.411.35 kg. The growth rate during the first gestation was 49.56 9.15 g/d. In the first, second, and third parties, the male: female childbirth ratios were found to be 56:44, 48:52, and 51:49, respectively. Each conception needed 1.2–1.4 services, and the gestation period was 148 days on average. In the first, second, and third parities, the average litter size was 1.08, 1.76, and 1.96, respectively. For the first, second, and third parities, the postpartum heat period was 48, 43, and 38 days, respectively. From 199 days in the second parity to 187 days in the third parity, the kidding interval also decreased considerably ( $p < 0.05$ ). Males on average

weighed 1.14 kg more at birth than females (1.06 kg). In the first, second, and third parities, the total litter size produced was 1.22, 1.79, and 2.03 correspondingly. First, second, and third parity live weights at kidding were 15.41, 18.43, and 19.99 kg, respectively. With the parity, child mortality dropped from 22.2 to 8.16%. The third parity of Black Bengal Goats performed more productively and reproductively than the first and second parities.

### **2.1. Socioeconomic Background of Goat Production in Bangladesh**

The poor rural and marginal farmers are under-resourced, have little access to government resources, and are not included in any of the country's development programs. These people make the majority of their money by selling their labor, notably in the agricultural sector. There may be times of the year when they are unable to work as day laborers. The country has a lot of large farms. 90% of goats are grown by marginal and landless farmers in rural areas. The main reasons that landless and marginalized persons keep goats are as follows.

- Managing a goat farm requires little management. There is increased pressure on the land to produce crops solely for human use as a result of the worrisome rate of human population growth (1.5). A total of 77 percent of the arable land is used to grow rice, 3 percent to grow oil seeds and pulses, 1 percent to grow other crops, and 10 percent is occupied by ponds, rivers, and canals (Kamruzzaman, 2005). Because there are so few chances to use land for the production of fodder, it is extremely difficult for marginal farmers and landless people to grow costly cattle and buffaloes. They can always afford to have goats, though, as they are much less expensive to maintain and riskier than large ruminants.
- Goats are a reliable source of consistent revenue and may be kept alive without any assistance (Miller and Lu, 2019). A sedenterized method of grazing on harvested or fallow areas, where goats are tethered to a short rope for the remainder of the day, is used to sustain the bulk of the goat population with very low maintenance expenses. Goats may be purchased since they are reasonably priced by small farmers and landless people alike. In these rural areas, rearing goats is viewed as a form of insurance against crop failure and other natural disasters. Generally speaking, goats aid rural communities in overcoming a range of financial difficulties, especially during festivals, weddings, significant family illness, etc..
- Another crucial factor is that goat meat is almost always substantially more costly than other meats (Dubeuf et al., 2004). The marginal framers blame the increased demand for goat meat for their decision to raise goats. In rural regions, women and

children retain the majority of the population, which promotes self-reliance, economic stability, and revenue generation. This is a significant socioeconomic factor in rural goat farming. Considering these advantages, improving the scavenging goat production system can boost current contributions and enhance the standard of living for rural poor households.

## CHAPTER 3

### METHODS AND MATERIALS

#### 3.1 Study Area

The present inquiry was carried out in the areas of Golabari, Mahalchori, and Panchari upazilas within the Khagrachari district of Bangladesh. The geographical coordinates of Khagrachari district are latitude 23° 06' 28.33" North and longitude 91° 58' 12.25" East. The concentration of goat farmers in the region had a significant role in the decision-making process that led to the selection of the research area. Because goat raising is a substantial agricultural activity in the area and because it plays an important role in the socio-economic development of the surrounding community, this criterion was selected as the best option. As a result, it was determined that the region under examination was appropriate for the research of goat farming techniques and the effects such techniques have on the economics and ecology of the surrounding area.



**Fig. 3.1.** Khagrachhari District

*N.B:* Circles in the map indicate the study areas.

#### 3.2 Sampling Technique

In order to collect data for the study, a pre-designed structured questionnaire was utilized. Multi-stage sampling technique was followed during sampling. The methodology employed was a straightforward random selection method, which entailed interviewing a total of 150 families. The Upazila agricultural office provided detailed information concerning the goat producers. To ensure adequate representation of the goat-raising population, two villages were selected from each Upazila. Within each village, 25 households among household that raised goats were questioned using the structured questionnaire. This approach was deemed appropriate and dependable, as it facilitated the collection of accurate and comprehensive data from a representative sample of goat-raising households. The use of this methodology allowed for an objective and systematic analysis of the information collected, thus enabling the researchers to make informed conclusions and recommendations based on the findings.

### **3.3 Data Collection**

A well-structured questionnaire was developed specifically for the purpose of this study in order to facilitate the collecting of complete data. In-depth interviews with the respondents, during which the purpose of the study was made very apparent to the participants, were used to compile the data for the study. A wide range of information was gathered from farmers, including their ages, sexes, educational backgrounds, farm sizes, social standings, management expenses, land uses, and household sizes, among other demographic factors. The keeping of goats was the primary subject of this investigation; hence, information concerning breed, source of funding, feeding and nutrition, feed source, deworming, veterinarian care, and illness prevalence was also gathered. In order to get further information, such as the state in which the goat shelter was found, the researchers carried out a visual investigation of the farm and the sheds. Secondary sources, such as government documents, relevant books, journals, newspapers, articles, theses, and websites, were also consulted by the team in order to compile additional pieces of information. This was done to ensure that the data collected was as accurate and up to date as possible. The data collection period spanned between October to December, 2022, ensuring that the data collected was recent and relevant. The gathered information provides a comprehensive understanding of the goat farming industry and enables analysis to be conducted to identify opportunities for growth and improvement. In conclusion, the data collection methods used in this study were rigorous and reliable. The comprehensive information gathered provides an accurate representation of the goat farming industry, enabling analysis that can guide future decisions and improvements.



### **3.4 Data Analysis Technique**

The study employed a mixed methods approach by combining field surveys to collect primary data sources including published papers, Google, journals, and other sources to gather relevant information. The data were carefully scrutinized, verified, and revised to ensure accuracy and relevance to the study objectives. The collected data was classified, organized, and analyzed to produce the desired outcomes. Tabular data analysis was chosen due to its simplicity of calculation, widespread application, and comprehensibility. The majority of the data analysis was carried out using MS-Excel 2010 software, which enabled the focus on statistical measurements such as averages and percentages. The research process was carefully guided by the study objectives to ensure that the results obtained were in line with the research questions. The tabular data analysis method was chosen as it provided a structured framework to facilitate the presentation of the results. Overall, the methodology employed in this study enabled the collection and analysis of data to derive insightful conclusions that informed the study outcomes.

## CHAPTER 4

### RESULTS AND DISCUSSIONS

#### 4.1. Socio-economic conditions

This study investigated the individual characteristics of people in a certain area, including age, education level, family size, main occupation, marital status, farm size, source of investment, and annual income. The data was collected from a survey of 150 farming households.

**Table 4.1. Demographic conditions of respondents**

<b>Characteristic</b>	<b>Category</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Age</b>	Young (up-to 35)	12	8.00
	Middle-aged (36-50)	97	64.67
	Old (Above 50)	41	27.33
<b>Education</b>	Illiterate	50	33.33
	Primary (1-5)	45	30.00
	Secondary (6-10)	30	20.00
	> secondary (>10)	25	16.67
<b>Family Size</b>	Small (up to 3)	20	13.33
	Medium (4-6)	45	30.00
	Large (above 6)	85	56.67
<b>Main Occupation</b>	Agriculture	40	26.67
	Farming	20	13.33
	Business	10	6.67
	Service	5	3.33
	Labour	75	50.00
<b>Marital status</b>	Married	130	86.67
	Unmarried	10	6.67
	Widowed	10	6.67
<b>Farm size (hectre)</b>	Landless (upto-0.02 acre)	65	43.33
	Marginal (0.021-0.20 acre)	55	36.67
	Small (0.21-1.00 acre)	20	13.33

	Large (Above 3.00 acre)	10	6.67
	Own	80	53.33
	Bank	5	3.33
<b>Source of Investment</b>	NGO	150	100.00
<b>Annual Income (Thousand Tk.)</b>	Low (50-106)	95	63.33
	Medium (107-150)	35	23.33
	High (151-400)	20	13.33

#### **4.1.2. Age of the farmers**

The present study shows that most of the farmers (64.67%) belonged to the middle-aged category, followed by the old age group (27.33%) and young age group (8.00%). This indicates that the agriculture sector is largely dominated by middle-aged and old farmers. This is in line with previous research findings that suggest a declining trend in the number of young farmers and a significant increase in the number of middle-aged and old farmers. The reason for the lack of young farmers in the agricultural sector could be attributed to a lack of interest in agriculture, difficulty in accessing agricultural land, and preference for alternative job opportunities. Moreover, the age of the farmers is important in determining their experience and knowledge in agriculture, which is vital for the success of farming. Middle-aged and old farmers are expected to have greater experience and knowledge about agriculture due to their years of involvement in the sector. They are also expected to have more traditional beliefs and practices in agriculture, which may or may not be effective. Therefore, it is important for policy makers to consider the age factor in designing programs and policies for the development of the agricultural sector.

#### **4.1.3. Education**

The education level of the participants in this study was categorized into four groups: illiterate, primary (1-5), secondary (6-10), and above secondary (>10). Among the respondents, 33.33% were found to be illiterate, while 30% had completed primary education, 20% had completed secondary education, and 16.67% had an education level greater than secondary. The results indicate that a significant proportion of the farmers had a low level of education, as almost one-third of the respondents were found to be illiterate.

Low education levels are a significant challenge for farmers, particularly in developing countries. Without adequate education, farmers may lack the knowledge and skills necessary to adopt modern farming techniques, which can improve their yield and productivity. This lack of knowledge and skills can also result in low-quality agricultural products, which can negatively affect farmers' income. The findings of this study suggest that there is a need for interventions that can provide education and training to farmers, particularly those who have a low level of education. The results also indicate that a relatively small proportion of the respondents had education levels greater than secondary. This suggests that there is a need for interventions that can promote higher education among farmers. Higher education can enable farmers to acquire the knowledge and skills necessary to adopt modern farming techniques, develop innovative solutions to address the challenges faced in the agriculture sector, and enhance their access to new markets, technology, and information. Thus, policymakers and stakeholders in the agriculture sector should develop and implement programs that can promote higher education among farmers.

#### **4.1.4. Family size**

Most of the sample population had large family sizes (56.67%), which could have significant implications for household food security and economic outcomes. Large families may struggle to meet their basic needs and may have limited resources to invest in agriculture, leading to lower productivity and economic growth.

#### **4.1.5. Main occupation**

The main occupation of the respondents was found to be diversified in nature. Among the respondents, 26.67% of them were engaged in agriculture as their main occupation, 50% were involved in labor works, while 13.33% were either involved in farming or doing business. Only 3.33% of the respondents were employed in service. The higher proportion of respondents engaged in agriculture might indicate that they reside in rural areas where agriculture is the main source of income. This finding is supported by the fact that a significant number of respondents were also found to own land, indicating their involvement in farming. The results also indicate that the majority of respondents were engaged in labor works, which is a common occupation in developing countries. It is possible that the respondents may have migrated from rural to urban areas for work, and as a result, ended up working in labor-intensive jobs. Overall, the findings suggest that there is a need for more employment opportunities in the study area, especially in sectors other than agriculture and labor works. Additionally, the study recommends the promotion of entrepreneurship as

a way of diversifying the economy and providing more employment opportunities to the local population.

#### **4.1.6. Marital status**

The bulk of the sample population was married (86.67 %), while the remaining individuals were single and widowed. This emphasizes the significance of the family unit in rural regions and the possible role of women as the primary labor providers in the agricultural sector.

#### **4.1.7. Farm size**

The farm size of the respondents varied in the study. The majority of the respondents had land holdings of up to 0.02 acres (43.33%), while 36.67% of them had marginal land holdings of 0.021-0.20 acres. Only 6.67% of the respondents had large farm sizes above 3.00 acres, and the remaining 13.33% had small farm sizes of 0.21-1.00 acres. The result indicates that some of the respondents had small land holdings, which may be a result of high population density and a limited availability of cultivable land in the study area. A similar finding was reported by Rahman et al., (2018) in their study on the agricultural practices of smallholder farmers in Bangladesh. A small farm size can pose significant challenges for farmers in terms of productivity and profitability. Small farms have limited resources, which makes it challenging for the farmers to invest in modern farming techniques and machinery. This lack of access to modern inputs may reduce the yield potential of crops and result in lower income for farmers. However, these small farm sizes also mean that farmers can concentrate on the production of high-value crops, which can generate higher revenue per unit of land.

#### **4.1.8. Source of investment**

Most of the sample population received investment from NGOs (100%). This highlights the limited role of formal financial institutions in rural areas and the potential of NGOs to act as an alternative source of investment for agricultural and rural development activities.

#### **4.1.9. Annual income**

The majority of the sample population had low annual incomes (63.33%), indicating the need for policies and programs to address poverty and inequality in rural areas. A small percentage of the sample population (13.33%) had high annual incomes, which may indicate the presence of wealthier households with greater economic and political influence.

## **4.2. Management Practice**

### **4.2.1. Housing system and house cleaning**

The majority (56.67%) of the respondents live in a house made of tin-shed, followed by bamboo-straw made (23.33%), and soil and others made (20.00%). Most respondents prefer a house made of tin-shed, which may be due to its durability and ease of construction. However, the use of bamboo and straw made houses are eco-friendly and affordable options that can contribute to a sustainable environment. Further research can be conducted to explore the reasons for the preference of the respondents for a particular type of house.

### **4.2.2. Macha**

A small portion (17.33%) of the respondents have macha in their house, while the majority (82.67%) do not have it. Macha is a traditional platform made of bamboo or wood, raised above the ground, which is used for sleeping or sitting. Although macha is a traditional item and has been used for ages, it is gradually disappearing from modern homes. Future studies can explore the reason for the decline in the use of macha in homes and the impact of its absence on the physical health and cultural values of the residents.

### **4.2.3. Ventilation**

In terms of ventilation, the majority of respondents (62.67 %) reported inadequate ventilation, while just 21.33 % reported adequate ventilation and 16.00 % did not have ventilation in their dwellings. Poor ventilation in a home may negatively impact the health and well-being of its inhabitants, causing respiratory disorders and other health concerns. Consequently, actions to improve optimal ventilation in dwellings are necessary, especially in metropolitan settings.

### **4.2.4. Cleaning regularly**

The majority of the respondents (84.67%) reported that they clean their houses regularly, while a small percentage (15.33%) did not. A clean and hygienic living space is essential for maintaining good health and well-being. Future studies can explore the reasons for the lack of regular cleaning in some homes and the impact of poor housekeeping practices on

the physical and mental health of residents. Moreover, interventions to promote regular house cleaning practices can be developed to improve the overall health and well-being of residents.

**Table 4.2. Households System**

<b>Characteristics</b>	<b>Category</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Type</b>	Tin-shed	85	56.67
	Bamboo-straw made	35	23.33
	Soil and others made	30	20.00
<b>Macha</b>	Yes	26	17.33
	No	124	82.67
<b>Ventilation</b>	Sufficient	32	21.33
	Insufficient	94	62.67
	Not at all	24	16.00
<b>House cleaning regularly</b>	Yes	127	84.67
	No	23	15.33

### **4.3. Goat Feeding Management**

#### **4.3.1. Sources of feed**

The table shows that 36% of the farmers surveyed use only grazing as a source of feed for their livestock, while 50% of them use a combination of grazing and feed supplements. The remaining 14% use only feed supplements. This suggests that grazing is still the most common source of feed among farmers, although many of them also supplement their livestock's diet with other types of feed. The use of feed supplements may be influenced by factors such as the availability of pasture, the quality of grazing land, and the specific nutritional requirements of the animals.

#### **4.3.2. Fodder Source**

The majority of the farmers surveyed (62.67%) rely on natural sources of fodder, such as grasses, legumes, and other vegetation found in their surroundings, while 20.67% cultivate

their own fodder crops. Only 16.67% of the farmers reported buying fodder from external sources. This suggests that most farmers in the study area rely on the natural resources available to them for their livestock's fodder needs. The preference for natural sources of fodder may be due to their availability and lower costs, as well as the potential for better nutrition for the animals.

#### **4.3.3. Concentrate Feed**

The table shows that only 12.67% of the farmers surveyed use commercial feed as a concentrate feed, while the majority (52.67%) rely on wheat bran. This may be due to the availability and affordability of wheat bran, as well as its nutritional value for livestock. The use of mixed concentrate feed and no concentrate feed at all was reported by 18.67% and 16% of the farmers, respectively. This suggests that while the use of commercial feed is not widespread among farmers, there is a diversity of concentrate feed options being used.

#### **4.3.4. Provision of Drinking Water in the Shed**

All of the farmers surveyed reported providing their livestock with drinking water, but only 33.33% of them reported providing water in the shed. This suggests that a significant proportion of the farmers rely on natural sources of water, such as streams or ponds, and do not see the need to provide additional water in the shed. The provision of drinking water is crucial for the health and productivity of livestock, and ensuring access to clean and fresh water is important for farmers to consider in their management practices. Overall, the table provides valuable insights into the feeding practices of smallholder farmers in the study area, highlighting the importance of natural resources in providing feed for livestock, and the diversity of feed options being used. The findings can be useful for researchers, policy makers, and extension workers in designing interventions and support mechanisms for smallholder livestock farmers.

**Table 4.3. Goat Feeding Management**

<b>Characteristics</b>	<b>Category</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Sources of feed</b>	Only Grazing	54	36.00
	Only feed Supplement	21	14.00
	Grazing & Supplement	75	50.00



<b>Fodder Source</b>	Cultivation	31	20.67
	Natural	94	62.67
	Buying	25	16.67
<b>Concentrate feed</b>	Commercial feed	19	12.67
	Wheat bran	79	52.67
	Mixed	28	18.67
	Not at all	24	16.00
<b>Provision of drinking water in the shed</b>	Yes	50	33.33
	no	100	66.67

#### 4.4. Breeds

The table shows the frequency and percentage distribution of different goat breeds in a particular region. The most common breed is Black Bengal, with a frequency of 120 and a percentage of 80%. Jamuna Pari is the second most common breed, with a percentage of 9.33%. Cross breeds are less common, with percentage of 7.33%. These results suggest that Black Bengal is the most preferred breed in the region, with a majority of goat farmers choosing this breed. The high percentage of Black Bengal goats can be attributed to their adaptability to the local environment, resistance to various diseases, and good meat and milk production. Jamuna Pari is also a popular breed in the region but is less common than Black Bengal. Cross breeds and others have relatively lower frequencies and percentages, indicating that they are not as preferred by goat farmers in the region.

**Table 4.4. Breeds Found in Study Area**

<b>Category</b>	<b>Frequency</b>	<b>Percent (%)</b>
Black Bengal	120	80
Jamuna Pari	14	9.33
Cross Breed	11	7.33
Other Breeds	5	3.33

#### 4.5. Control of Disease in Farm

##### 4.5.1. Idea about Disease

The purpose of this paper is to discuss each characteristic in more detail and analyze the findings presented in the table. Idea about disease is a key factor in animal husbandry because it determines the level of awareness and preparedness of animal owners to prevent, manage, and treat diseases in their animals. According to the data presented in the table, 16.67% of the respondents had a clear idea about diseases, while 66.67% had a partial idea, and 16.67% had no idea at all. This finding indicates a need for more education and awareness-raising campaigns to improve the knowledge of animal owners about disease prevention and management.

#### **4.5.2. Vaccination and Vaccine Source**

Vaccination is a crucial aspect of animal health as it protects animals from various infectious diseases. According to the table, only 20% of the respondents vaccinated their animals regularly, while 60% did it irregularly, and 20% did not vaccinate at all. This finding suggests a lack of awareness and understanding of the benefits of vaccination and the need to promote vaccination programs to improve animal health. Vaccine source is an important factor that determines the accessibility and availability of vaccines to animal owners. According to the data presented in the table, 50% of the respondents obtained vaccines from veterinary offices, while the other 50% acquired them from local markets. This finding highlights the importance of ensuring the quality and safety of vaccines, regardless of the source.

#### **4.5.3. Anthelmintic**

Livestock in Bangladesh often suffer from parasitic infection, which leads to a variety of illnesses and ultimately lower output. Deaths, stunted development, and lower milk output are all costly consequences of parasite diseases. Parasites have a role in the decline in skin quality. An anthelmintic is a drug prescribed for animals to eliminate or prevent the development of parasitic worms. The table shows that just 23.33 percent of respondents frequently used anthelmintic, 26.67 percent used it sporadically, and 50 percent never used it. This finding indicates a lack of awareness of the importance of controlling internal parasites and the need to educate animal owners about the benefits of regular use of anthelmintics. Veterinary services are critical for animal health as they

provide medical care, consultation, and support to animal owners. According to the table, 16.67% of the respondents consulted veterinary doctors, while 66.67% sought services from village doctors, and 16.67% did not consult anyone. This finding indicates a need to promote veterinary services and improve the accessibility and availability of veterinary doctors in rural areas.

#### **4.5.4. Veterinary Services**

Veterinary services are essential for the health and wellbeing of animals, and for ensuring the safety and sustainability of food production systems. The data presented in the table shows that 16.67% of the respondents received veterinary services from a veterinary doctor, while 66.67% received services from a village doctor, and 16.67% did not receive any consultancy services at all.

The use of veterinary doctors is critical for the diagnosis and treatment of animal diseases, as well as for the provision of preventive care, such as vaccinations and deworming. However, the data suggests that a majority of the respondents relied on village doctors for their animal healthcare needs. While village doctors may provide some level of care, they may not have the necessary expertise or resources to provide comprehensive veterinary services.

This finding highlights the need for increased access to veterinary services and education for animal owners about the importance of utilizing veterinary doctors for their animal healthcare needs. Efforts should be made to strengthen the veterinary infrastructure, including the training and retention of veterinary doctors, the establishment of veterinary clinics and hospitals, and the provision of outreach and extension services to rural communities.

#### **4.5.5. Disposal of Dead Body and Placenta**

Dispose of dead carcass and placenta are essential practices that prevent the spread of diseases and ensure environmental hygiene. According to the data presented in the table, 90% of the respondents buried dead carcasses, while 10% left them to decay outside. Similarly, 53.33% of the respondents threw away placenta, while 46.67% buried it. This finding highlights the need to promote safe and hygienic disposal practices to prevent the spread of diseases and protect the environment. The findings presented in the table provide

useful insights into the characteristics related to animal health and husbandry practices in rural areas. The results indicate a need for education and awareness-raising campaigns to improve the knowledge and understanding of animal owners about disease prevention, vaccination, anthelmintics, and safe disposal practices. Additionally, the findings highlight the importance of promoting veterinary services and improving their accessibility and availability in rural areas to ensure the well-being of domesticated animals.

**Table 4.5. Prevention and Control of Diseases in Farmhouse**

<b>Characteristics</b>	<b>Category</b>	<b>Frequency</b>	<b>Percent (%)</b>
Idea about disease	Clear idea	25	16.67
	Partial idea	100	66.67
	Not at all	25	16.67
Vaccination	Regular	30	20.00
	Irregular	90	60.00
	Not at all	30	20.00
Vaccine source	Vet office	75	50.00
	Local Market	75	50.00
Anthelmintic	Regular	35	23.33
	Irregular	40	26.67
	Not at all	75	50.00
Veterinary services	Veterinary doctor	25	16.67
	Village doctor	100	66.67
	No consultancy	25	16.67
Dispose of Dead			
Carcass	Burn	0	0.00
	Buried	135	90.00
	Left to decay outside	15	10.00
Dispose Of Placenta	Throwing	80	53.33
	Buried	70	46.67

## **4.6 Assessment of Farm Profitability**

### **4.6.1 Estimation Cost per Goat According to Goat Rearing Farmers**

The rearing system of goats in those upazilas is a semi-scavenging system. To assess profitability of farm the major costs and returns are included. In that area maximum goats are purchased from animal market. The major costs of goat farming are such as- goat purchasing price, feed cost, vet and medicine cost, mating cost, labour cost. The goat purchasing price, feed cost, vet and medicine cost, mating cost, labour cost and other cost are on average 1900 Tk, 1466 Tk, 450Tk, 80 Tk, 537Tk, and 90 Tk respectively. The depreciation cost for and minor equipment are 130 Tk and 90 Tk respectively.

### **4.6.2 Estimation of return per goat According to Goat Rearing Farmers**

The returns are gained by selling goat in the market and selling milk of goat and selling kids and does. The return from selling per goat is 3500tk ranging from 4000tk to 2800tk besides that return from selling milk and kid are 245tk and 2200 Tk respectively. Therefore, farmers get returns Tk 605 averagely by selling other materials. Farmers sells the goat at local market. Kids and doe are sells at other farmers who are interested to raised goats.

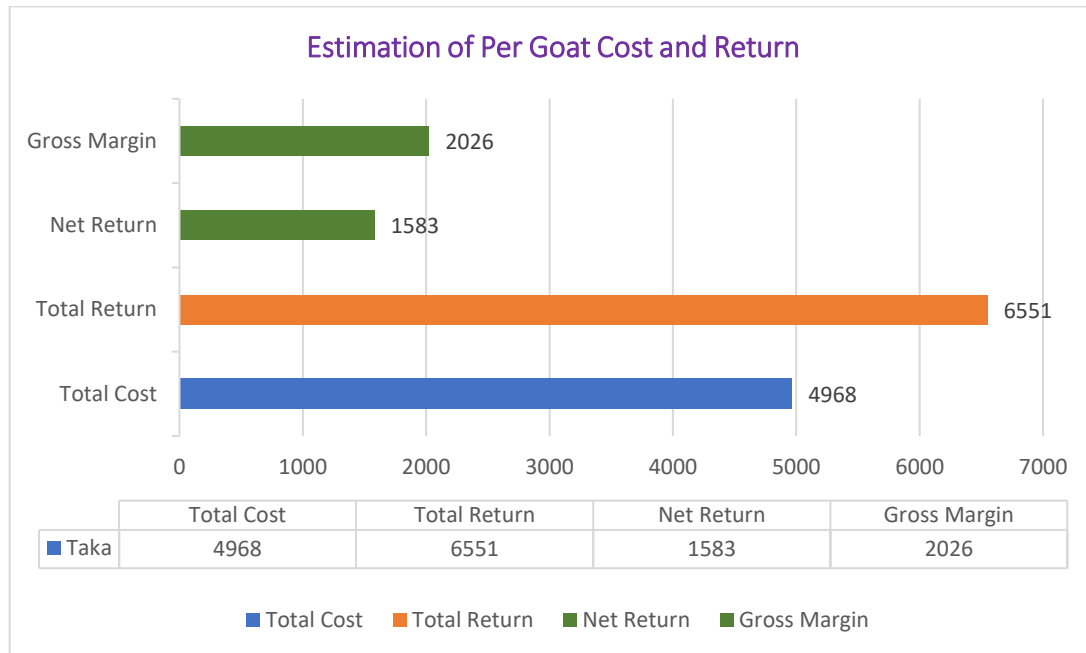
After assessment Total return is 6551 Tk which can maximum 7520 Tk Tk to 5538tk and net return is 1583 Tk averagely ranging from 1678 Tk to 1287 Tk. So, the benefit cost ratio of 150 family of goat rearing farmers is 1.3. The gross margin of total 150 family of goat farmers is 2026 Tk.

**Table 4.6: Cost Estimation And Profitability Per Goat For Goat Raising Farmers (N=150)**

For each goat	ALL (N=150) Mean $\pm$ SD (BDT/goat)	Range BDT per Goat		Percentage
		Maximum	Minimum	
<b>A. Particular of Costs:</b>				
Variable Costs:				
1. Initial goat price	1900 $\pm$ 150	2100	1800	40.02%
2. Feed cost:				
Green grass/leaves	652.88 $\pm$ 20	682.88	632.88	13.75%
Concentrates	570 $\pm$ 35	600	540	12%
Rice bran/broken rice	244.10 $\pm$ 70	315	170	5.14%
3. Vet. Care & Medicine Cost	450.88 $\pm$ 71.67	522	380	9.49%
4. Cost of mating of doe	80 $\pm$ 14.93	100	60	1.68%
5. Labour cost	537.1 $\pm$ 178.7	720	360	11.31%
6. Others	90.19 $\pm$ 28.095	120	70	1.9%
Total Variable Costs	4525.15 $\pm$ 568.4	5159.88	4012.88	95.33%
Fixed Costs:				
Depreciation cost of housing	130.9 $\pm$ 82.93	231	50	2.76%
Minor equipment costs etc.	90.71 $\pm$ 19.52	110	70	1.91%
Total Fixed Cost	221.61 $\pm$ 102.45	341	120	4.67%
Total Cost (TC)	4968.37 $\pm$ 670.85	5841.88	4252.88	100%
<b>B. Estimation of Returns:</b>				
Return from selling goat	3500 $\pm$ 242.2	4000	2800	51.1%
Income from milk of goat	245.71 $\pm$ 32.45	270	210	4.53%
Income from selling kids and does	2200 $\pm$ 300.7	2500	2000	33.2%
Return from selling other materials	605.71 $\pm$ 137.75	750	529	11.17%
Total Return	6551.42 $\pm$ 713.11	7520	5538.12	100%
Net Return (TR-TC)	1583.05 $\pm$ 42.26	1678.12	1287.12	
Benefit Cost Ratio		1.3		
Gross Margin (TR- TVC)	2026.27	2360.12	1525.24	

Source: Field Survey, 2023

### 4.6.3 Estimation of Per Goat Cost And Return



**Figure 4.1: Per Goat Cost And Return**

The bar chart represents the cost estimation and profitability of goat farming for 150 goat-raising farmers in Bangladesh, with the currency in Bangladeshi Taka (BDT). The chart includes three series of data, represented by different colored bars.

The first series, represented by blue bars, shows the total cost of goat farming per goat, which is 4,968 BDT. The second series, represented by orange bars, shows the total return per goat, which is 6,551 BDT. Finally, the third series, represented by green bars, shows the net return and gross margin per goat, which are 1,583 BDT and 2,026 BDT, respectively.

The benefit-cost ratio for the farmers is 1.3, indicating that the total returns from goat farming are 1.3 times higher than the total costs incurred. The chart also shows that the third series has the highest net return and gross margin, indicating that this series may be the most profitable for the farmers.

Overall, the chart provides a clear and concise visualization of the cost and profitability of goat farming in Khagrachhari, Bangladesh and can be useful for farmers and other stakeholders in the industry to make informed decisions about their operations.

## **CHAPTER 5**

### **CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Conclusions**

This research describes the social and economic life of farmers in a portion of the Khagrachhari area. The majority of farmers were middle-aged or older, and a big proportion of them had a poor level of education. Farmers in the study region also face significant difficulties due to their large families, tiny farms, and limited employment alternatives. Due to their lack of technological knowledge, however, they were unable to put up a decent housing system, and they kept to the old method of feeding by utilizing wheat bran concentrate and natural pasture. Farmers also had incorrect beliefs about how to maintain health. Due to this, they did not always utilize anthelmintics and immunizations and sought counsel from the local physician. The placenta and corpse were either discarded or buried. Farmers utilize buck for breeding, regardless of whether or not the animals are related. Therefore, goat farming in the region would be more successful if issues with housing, food, and infections were resolved and a better method of breeding goats was discovered.

#### **5.2. Recommendations**

The findings suggest that policymakers and stakeholders in the agricultural sector should develop and implement programs that can promote higher education among farmers and provide better access to agricultural land. Encouraging middle-aged and old farmers to share their knowledge and expertise with young farmers could help bridge the knowledge gap between different age groups of farmers. To encourage young farmers to enter the agriculture sector, the government could implement policies that provide young farmers with better access to agricultural land, provide training and education in modern farming practices, and offer financial incentives. In addition, middle-aged and old farmers should be encouraged to share their knowledge and expertise with young farmers, which could help to bridge the knowledge gap between different age groups of farmers. To address the challenges of large family sizes and limited access to employment opportunities, the study recommends the promotion of entrepreneurship as a way of diversifying the economy and providing more employment opportunities to the local population.



Furthermore, policies that encourage the adoption of modern farming techniques could help improve the productivity and profitability of small farms, which constitute the majority of farms in the study area. Overall, the study highlights the need for targeted interventions that can address the specific challenges facing farmers in the study area. These interventions could help improve the socioeconomic status of farmers and contribute to the sustainable development of the agricultural sector.

## REFERENCES

- Acharya, R. M. (1988). Goat Breeding and Meat Production in India. In Proceedings of the Workshop Held in Tando Jam, Pakistan.
- Amin, M. R., Hussain, S. S., & Islam, A. B. M. M. (2001). Reproductive peculiarities and litter weight in different genetic groups of Black Bengal does. *Asian-Australasian Journal of Animal Sciences*, 14(3), 197-301.
- Assan, N., & Sibanda, M. (2014). Goat production in the smallholder section in the Matobo district in semi-arid areas of Zimbabwe. *Agricultural Advances*, 3(8), 218-228.
- Aziz, M. A. (2010). Present status of the world goat populations and their productivity, 861(1078.2), 1.
- Banerjee, G. C. (1980). A text book of animal husbandry. Mohan Pramlami, Oxford and IBM Publishing Company.
- BBS (2007). Statistical Year Book of Bangladesh. Bangladesh Bureau of Statistics, Ministry of Planning, Government of the People's Republic of Bangladesh.
- BBS. (2007). Bangladesh Bureau of Statistics. <http://www.bbs.gov.bd/>
- Chowdhury, S. A., Bhuiyan, M. S. A., & Faruk, S. (2002). Rearing Black Bengal Goat under Semi-Intensive management 1. Physiological and Reproductive Performances. *Asian-Australasian Journal of Animal Sciences*, 15(4), 477-484.
- Devendra, C. (1980). Potential of sheep and goats in less developed countries. *Journal of Animal Science*, 51(2), 461-473.
- Devendra, C., & Burns, M. (1983). Goat production in the tropics. Commonwealth Agricultural Bureau.
- Donkin, E. F., & Boyazoglu, P. A. (2004). Diseases and mortality of goat kids in a South African milk goat herd. *South African Journal of Animal Science*, 34, 258-261.
- Dossa, L. H. (2008). Socioeconomic determinants of keeping goats & sheep by rural people in Southern Benin. *Agricultural and Human Values*, 25, 581-592.
- Dubeuf, J.-P., Morand-Fehr, P., & Rubino, R. (2004). Situation, changes and future of goat industry around the world. *Small Ruminant Research*, 51(2), 165-173.
- Ensminger, M. E., & Parker, R. O. (1986). *Sheep and goat science* (5th ed.). Danville, IL: The Interstate Printers and Publishers Inc.
- Ershaduzzaman, M., Alam, M. S., Munsi, M. N., Islam, M. R., Hasan, M. R., & Talukder, M. A. I. (2007). Incidence of sheep and goat diseases reared under-intensive and

- semi-intensive system. Annual Research Review Workshop-2007, P-62, 13-14 June, BLRI, Bangladesh Livestock Research Institute, Savar, Dhaka 134.
- FAO (Food and Agricultural Organization of the United Nations) (2010). Asian Livestock Monthly Technical Magazine of the FAO Animal Production and Health Commission for Asia and the Pacific (APHCA), 8, 85-87.
- FAO (Food and Agricultural Organization of the United Nations) (2010). Production Year Book. Rome, Italy, 53, 213-219.
- Hassan, et al. (2007). A comparative study on reproductive performance and productivity of the Black Bengal and Cross bred goat at Atrai, Bangladesh. University Journal of Zoology, Rajshahi University, 26, 55-57.
- Husain, S. S. (1993). A study on the productive performance and genetic potential of Black Bengal goats (Unpublished doctoral dissertation). Bangladesh Agricultural University, Mymensingh, Bangladesh.
- Husain, S. S., Amin, M. R., & Ishlam, A. B. M. M. (1998). Goat production and its breeding strategy in Bangladesh. In Proceedings of National Workshop on Animal Breeding held in Bangladesh Agricultural University, Mymensingh on November 26, 1998, pp. 17-36.
- Herre, W., & Röhrs, M. (1973). Haustiere-Zoologisch gesehen (Compendium of basic data).
- Husain, S. S., Islam, A. B. M. M., & Horset, P. (1995). Effect of different factors on pre-weaning survivability of Black Bengal kids. Small Ruminant Research, 18, 1-5.
- Kader, M. F. (2006). Khuddra rin pradankari prathistan: Daridra bimusanay pratistanic puji. The Daily Prothom Alo, February 5.
- Kamruzzaman, M. (2005). Contribution of household goat farming to sustaining rural livelihood in a selected area in Mymensingh District (Unpublished master's thesis). Bangladesh Agriculture University, Mymensingh, Bangladesh.
- Kober, H. (2005). Problem confrontation of farmers in rearing Black Bengal Goats. In Proceedings of the third Annual Scientific conference, 14-15 March 2005. Chittagong Veterinary and Animal Sciences University, Chittagong-4202, Bangladesh.
- Kosgey, I. S., Rowlands, G. J., Van Arendonk, J. A., & Baker, R. L. (2008). Small ruminant production in smallholder and pastoral/extensive farming systems in Kenya. Small Ruminant Research, 77(1), 11-24.
- Luginbuhl, J. M., Green, J. T., Muller, J. P., & Poore, M. H. (1996). Meat goats in land and forage management. In Proceedings of the Southeast Regional Meat Goat

- Production Symposium “Meat Goat Production in the Southeast-Today and Tomorrow”, February 21-24, 1996. Florida A&M University, Tallahassee, FL.
- Miller, B. A., & Lu, C. D. (2019). Current status of global dairy goat production: An overview. *Asian-Australasian Journal of Animal Sciences*, 32(8), 1219.
- Saadullah, M. (1991). Research and development activities and needs of small ruminants in Bangladesh. In A. Djajianegara & C. Devendra (Eds.), *Research and Development Needs of Small Ruminants in Asia* (pp. Small Ruminant Production Systems Network in Asia [SRUPNA]). Indonesia.
- Sarker, S., & Islam, M. H. (2011). Prevalence and risk factor assessment of Peste des petits ruminants in goats in Rajshahi, Bangladesh. *Veterinary World*, 4(12), 546-549.
- Sayeed, M. A., Rahman, S. M. A., Taimur, M. J. F. A., Faruque, S., & Yasmin, F. (2005). Effect of farm categories on prevalence of goat diseases and financial loss under scavenging system of rearing in some selected areas of Bangladesh. *Bangladesh Journal of Livestock Research*, 12(1-2), 58-65.
- Smith, M. C., & Sherman, D. M. (1994). *Goat medicine* (2nd ed.). Philadelphia: Lea and Febiger.
- Sriram, P. K., Rao, P. R., & Naidu, N. G. R. (1982). Goat mortality in Andhra Pradesh. *Indian Veterinary Journal*, 59, 96-99.
- Yasmin, F., Rahman, S. M. A., Begum, J., & Alam, J. (2007). An assessment of micro-credit on goat production at Narchar for reducing poverty in Bangladesh. *Annual Research Review Workshop-2007*, P-44, 13-14.