**Chapter-I**

**Introduction**

* 1. **Problem statement**

Bangladesh is the highest densely populated country (1015 people per k$m^{2}$) in the world with a population of 168.07 million people within the area of 147570 k$m^{2}$(BBS, 2019). About 80% people of this country still lives in villages and are extremely poor. In 2018, 36.5% of the urban and 63.5% of the rural people was surviving under the poverty line. However, the people of our country are blessed with a variety of livestock resources of which goat rearing is considered to have potential both for poverty alleviation and food production. For this circumstance the Govt. & various non-government organizations have promoted poultry & goat rearing to the poor farmers with credit & input support since 1980’s in this country (Islam *et al.* 1992, DLS 1998; Fattah, 1999; Das, 2004). Bangladesh government has also given special emphasis and adopted a national programmed on Black Bengal goats for poor farmers to reduce poverty with targeting the Millennium Development Goals(MDGs) achievement since 2003(Kader, 2006). Goat rearing is suitable for widespread implementation as it cost less, requires little skills, is highly productive and can be incorporated into the household works (Dolberg *et al.*, 1997).

Livestock plays an important role in the agricultural economy of Bangladesh. Contribution of livestock sub-sector to the GDP was 2.95%, which was estimated about 17.32% to agriculturalGDP (DLS, 2010). According to Bangladesh Economic Review (2006) and DLS (2008), per annual growth rate of 7.23% in GDP in 2004-2005 for livestock was the highest in all sub-sectors (Uddin, 2010).

The supply of the domestically produced livestock products (Meat, Milk, Eggs) are increased 1.2% annually (DLS, 2000). About 36% of total animal protein comes from the livestock products in our everyday life. As an integral part of agricultural system, livestock has direct impact on income generation, poverty alleviation and meet up of nutritional demand. But the domestic livestock production is inadequate to meet the current demand of milk, meat, eggs and balancing nutritional needs of people.

Goat is called the poor man’s cow since it is well recognised as a renewable resource for the poor people and the first farm animals associated with the human in an interdependent relationship for a long time. It proved useful to human over the age for its productivity, size and quality as food.

 In Asia 71 percent goat reared by small holder farmer. In case of Bangladesh out of 2 crore goats, 52 percent reared by landless marginal farmer (Chowdhury *et al*.,2002). In Bangladesh, the average number of goat per farm is 4, which is equal to the south-east Asian countries, like Indonesia, Malaysia and Thailand. Forty one percent farm income come from goats in some parts of Bangladesh. Besides, leather is the best export goods in Bangladesh that earn 25 crore Taka per year (Chowdhury *et al*.,2002).

According to the Department of Livestock Services (2015-2017), there are 257.66 lakh goats in Bangladesh contributing partly in total livestock meat production (61.52 Lakh Metric Ton). About 45% population in Bangladesh lives under the poverty line, and among total farm household, 36% people are involved with goat rearing.

Since a new pandemic, COVID-19, caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) started in China in December 2019 and has rapidly spread around the world, it causes a great impact on every sector as well as livestock. COVID-19 was officially declared in Bangladesh in 11 March,2020.

Goat farms were considered economically essential activities. It involved a social and economic impact on most sectors, which is difficult to estimate. To evaluate the socio-economic impact on goat production system during pandemic in Chittagong district in Bangladesh, appropriate intervention is very much important.

The study will help to assess the needs of the goat producers and will also help to suggest interventions for better management to increase goat productivity. It will also help us to understand the socio-economic condition of small scale goat farmers with their current situation of facing the COVID-19 pandemic.

1.2. **Objectives of the study**

The specific objectives of the study was

* To describe the socio-economic characteristic profiles of small scale goat farmers in some selected areas.
* To assess the management, housing and feeding practices of the goat farms under the study area.
* To estimate the profitability of the goat farms before and during pandemic (Covid-19).
* To identify the problems and make remedial suggestive measures of small scale goat farming under current situation.

Chapter IIMaterials and Methods

Selection of a methodology is very essential to support any research and that's why the methodology of the current study was selected carefully following logical and scientific views. This chapter describes the methodology used for the current study.

**2.1 Survey Design and conduct**

 A survey method is one of the several methods of data collection. The survey was designed to obtain necessary data of goat rearing. The survey method for the present study involved the following steps

### 2.1.1. Selection of the study area

The study was conducted in Chattogram (Khulshi,Pahartoli, AK khan area)metropolitan area. The study was conducted in this area due to fast growing of small scale goat farming in this locality.

### 2.1.2. Study period

The study was conducted between the periods of 1st July, 2021 to 30th October, 2021

**2.1.3 Sources of data**

Data for this study was obtained from small holder goat farmers who have at least 3-5 goats and have been involved in rearing for last three yearsby primary sources. The primary data were collected from the production performance, activities and economic condition of the goat rearing using structured questionnaires.The secondary information was obtained from various sources like Department of Livestock Service (DLS), Bangladesh.

**2.1.4 Sampling designand sample size**

Purposive sampling technique was used in selecting study areas of this research. In a total 30 goat farms were randomly selected where 10 farms from each area.

**2.1.5 Preparation of questionnaire:**

Questionnaire is very important for a successful survey. The schedule was prepared maintaining relevance with the objectives of the study. Before launching the survey, the questionnaire was pretested and improved accordingly. The preliminary questionnaires were prepared before conducting the final field survey. In order to collect the more purified data of various families an organized questionnaire was formatted (Nauta *et al.,* 2001; De Jong and Van Soest, 2001). Thus the schedule developed finally. The following points take in mind for making the questionnaire:

1. Socioeconomic characteristics of goat farmers.
2. Biological information about goat such as total number of goats, breed of goats, age, kids number, feeding system, morbidity & mortality etc.
3. Cost and return of goat farming.

**Measurement of some important characteristics of the respondents**

|  |  |  |
| --- | --- | --- |
| **Variable names** | **Description of measurement** | **Remarks** |
| Age | Number of years at the time of data collection | Range unknown |
| Educational status | Number of level/class/examination passed/ attended by a respondent. A score of one (1) assigned for up to primary level study, while a score of 2 assigned for secondary level. For HSC and above score was 3.  | Possible range: From one (1) to three (3) |
| Family size | Number of members live and eat together with common cooking unit.  | Range unknown |
| Farm size | All area under farming by the household members: homestead, own land, land under borga/sharecropping (half benefit calculated), pond, fruit garden etc. | Measured in hectare |
| Annual income | Total income of all household members in past year (at the time of data collection).  | Also referred as annual family income/ annual household income |
| Training exposure | Days of training received from any agency (GO or NGO) in recent years (five years). | Possible score range unknown |
| Organizational participation | Number of years involved in different social institutions and organizations. | Possible score range unknown |

**2.1.6 Data collection**

Both qualitative and quantitative data was collected using household survey method. A survey schedule was developed and pre-tested for the study. After that it was finalize to collect data. Specially structured schedule was prepared in order to obtain information on production of goat. Researcher clearly explained the objectives of the study to respondent by using local language as far as possible. As a result the respondents furnished proper responses to the questions and statements without any hesitation. Excellent cooperation was received from the respondents and other people of the study area.

**2.2 Analytical technique:**

After data collection, the questionnaires were checked for completeness, cleaned, organized, coded and then entered into MS-Excel and STATA (Stata 14, Stata Statistical Software, Stata Corporation, College Station, Texas 77845 USA) for analysis. Both the descriptive, statistical and econometric methods were used to achieve the objectives.

* + 1. To determine profitability of per goat per farm production, the following algebraic equation was followed,

Net return/ Profit (π) = TR-TC

= --TFC

Where

TR and TC represent Total Return and Total Cost, respectively.

π= Profit/Net return from per goat (Tk);

Qb= Total unit of selling buck (nos.)

Pb= Per unit price of selling buck(Tk)

Qd= Total unit of selling doe (nos.)

Pb= Per unit price of selling doe (Tk)

Qc= Total unit of selling culled goat (nos.)

Pc= Per unit price of selling culled goat (Tk)

Qk= Total unit of selling kid (nos.)

Pk= Per unit price of selling kid (Tk)

Xi= Quantity of the concerned ith inputs;

Pxi= Per unit price of the relevant ith inputs;

TFC= Total fixed cost involved in production;

i= 1,2,3,...., n (number of inputs).

**2.2.1.1 Return Estimation**

Gross Margin=Total Return-Total Variable Cost=TR-TVC

Benefit Cost Ratio (BCR) (Full cost basis) =Total Return / Total Cost= TR/TC

BCR (Cash cost basis) =Total Return / Total Variable Cost=TR/TVC

**2.2.1.2 Cost estimation:**

**Interest on operating capital and Total Variable Cost**: The Bank interest rates (4%) were used to estimate the cost of capital which was provided by them and used as working capital.

**Interest on operating capital**= (Operating capital\*0.04)/2

**Total Variable Cost**(TVC) =Operating capital + Interest on operating capital

 **Fixed Cost**: Cost on goat houses and equipment were included under fixed cost.

**Cost of Housing and Equipment**: The cost of housing was calculated by taking into account the depreciation cost of housing. Cost of equipment was expressed as equipment cost, which was calculated by taking into accounts the depreciation cost of equipment.

Depreciation cost on house and equipment was worked out as follows:

 **Depreciation** = 

* + 1. Paired t test was used to comparison the mean value of feed cost, selling price of per goat and monthly income of goat farm household before (2019) and during (2020) covid-19 effect.

**Hypotheses:**The null hypothesis is:
 H0: There is no difference in mean after and before covid-19 effect.

And the alternative hypothesis is:
 H1: There is a difference in mean after and before covid-19 effect.

 The test value t formula is with d.f. (n-1).

$$t=\frac{¯D-µ\_{D}}{S\_{D}/√n}$$

n= Sample size

 ¯D=Differences of the values of the pairs of data

SD = The standard deviation of the differences
The expected value μD is zero if the hypothesis is μD = 0 . The confidence interval of the difference in the paired mean difference.

**2.2.3**For measuring the **problem index** of the dairy farmers during COVID-19 situation, a 4-point Likert Scale was used. The scales were weighted in order of importance from; high=4, mederate=3, low=2 and very low=1. The respondents were asked to indicate problem in dairy farming. Ranking of different problems faced by dairy farmers, the frequency of responses from each of the four point continuum of a specific activity under major activity was tabulated and multiplied by concerned score. Then they were added together to get the total score for each specific activity for the purpose of their ranking (Sailaja and Reddy, 2003).

Problem faced by each respondent was calculated by using the following formula,

$$Problem Indices \left(PI\right)=4×H+3×M+2×L+1×VL$$

 Where, H= High, M=Moderate, L= Low, VL=Very Low

**CHAPTER-III**

**RESULTS AND DISCUSSION**

### 3.1 Socio-economic characteristics of goat farm owners

Table 1 shows different level of farmers involved in goat rearing in selected study area. It reveals that majority (53.33%) fell into middle age category (26-40 age group), where 30 percent and 16.67 percent fell into young and old age category, respectively.About 58 percent farmers are married, rest are unmarried.

**Table 1: Socio-economic characteristics of goat farm owners:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parameters | Category | Frequency | Percentage (%) | Mean | Standard deviation |
| Age | 19-25( young) | 9 | 30 | 32.33 | 9.65 |
|  | 26-40(middle age) | 16 | 53.33 |  |  |
|  | >40 (old age) | 5 | 16.67 |  |  |
| Marital status | Married | 17 | 56.67 | 1.33 | 0.48 |
|  | unmarried | 13 | 43.33 |  |  |
| Education level | Primary | 3 | 10 | 2.33 | 0.66 |
|  | Secondary | 14 | 46.67 |  |  |
|  | SSC & above | 13 | 43.33 |  |  |
| Family size | Upto 8 | 23 | 76.67 | 7.77 | 2.59 |
|  | 9 to 12 | 4 | 13.33 |  |  |
|  | >12 | 3 | 10 |  |  |
| Dependent members | 2 to 4 | 12 | 40 | 5.1 | 1.92 |
|  | 5 to 7 | 13 | 43.33 |  |  |
|  | >7 | 5 | 16.67 |  |  |
| Training | Trained | 10 | 13.33 | 1.72 | 0.48 |
|  | Non trained | 20 | 66.67 |  |  |
| Occupation | Farmer | 8 | 26.67 | 2.29 | 0.95 |
|  | Businessman | 8 | 26.67 |  |  |
|  | Service holder | 12 | 40 |  |  |
|  | Student | 2 | 6.67 |  |  |
| Monthly income | 15000-25000 | 14 | 46.67 | 28866.7 | 7877.22 |
|  | 26000-35000 | 11 | 36.67 |  |  |
|  | 36000-50000 | 5 | 16.67 |  |  |
| Experience of farming | 3 to 6 | 22 | 73.33 | 5.17 | 2.21 |
|  | >6 | 8 | 26.67 |  |  |

In education level, majority (46.67%) fell into secondary categories. In case of family size, 76.67% families have upto 8 members where average 5 members were dependent.Regarding training, majority (66.67%) of the farmers have no training.Almost 46.67 % of the observed farm owners monthly average income levelwas below taka twenty five thousands, 36.67% was in between taka twenty six to taka thirty five thousands and significantly few owners (16.67%) has more than taka thirty six thousands. About experiencing of goat farming, 73.33% farmers fell into the category of having 3 to 6 years of experiences and 26.67% of the famers had more than 6 years of goat farming experience.

**3.2 General information of goat farms**

Table 2 illustrates average number of goats in the studied farms (n=30) before covid-19 and during covid-19. Before covid-19 the farmers had 8.76% local breed and 8.33% cross breed

**Table 2: General information of goat farms:**

|  |  |  |  |
| --- | --- | --- | --- |
| Criteria | Average numberof goats | Minimum number of goat reared | Maximum number of goat reared |
| Before covid | During covid | Before covid | During covid | Before covid | During covid |
| Local breed | 8.76 | 7.61 | 3 | 2 | 18 | 22 |
| Cross breed | 8.33 | 6.74 | 3 | 1 | 24 | 26 |
| Buck | 4.39 | 3.83 | 2 | 0 | 9 | 8 |
| Doe | 4.76 | 4.31 | 1 | 1 | 14 | 9 |
| Kid | 3.45 | 2.68 | 0 | 0 | 9 | 8 |

which turned 7.61% and 6.74% respectivelyduring covid-19 situation. In case of buck, doe and kid the percentages were 4.39, 4.76, 3.45, respectively before covid which turned into 3.83, 4.31, 2.68 percent during pandemic. During pandemic maximum number of local and cross breed reared by the farms was 22 and 26 where these were lower (18 and 24) before covid-19.

**3.3 Feeding information of goat farms**

Table 3 shows average quantity (kg) of feed intake by each goat per farm per month before and during covid-19 period.

**Table3: Feeding information of goat farms (n=30) before and during covid-19 pandemic:**

|  |  |  |
| --- | --- | --- |
| Feed type | Average amount of feed intake/goat/farm/month (kg) | Standard deviation |
| Roughage | Before covid | 31.2 | 18.01 |
| During covid | 17.07 | 13.58 |
| Concentrate | Before covid | 8.21 | 5.15 |
| During covid | 12.97 | 7.94 |

The estimated average amount of roughage intake by per goat per monthwas 31.2 kg before covid and significantly less during covid which was 17.07 kg. In case of concentrate feed type before covid average amount was 8.21 kg and during covid itwas 12.97 kg.

It is seen in table 4 that average price of roughage before covid was about taka 12.42 and during covid it was taka 15.19. In case of concentrate average price before covid was about taka 37.74 and during covid it was about taka 45.32.

**Table 4: Prices of feed purchased by farms (n=30) before and during covid-19 pandemic**

|  |  |  |
| --- | --- | --- |
| Feed type | Average prices of feed/kg (tk) | Standard deviation |
| Roughage | Before covid | 12.42 | 6.74 |
| During covid | 15.19 | 7.84 |
| Concentrate | Before covid | 37.74 | 4.29 |
| During covid | 45.32 | 5.63 |

**3.4 Mortality and morbidity**

The morbidity and mortality rates of the goats in the studied farm shows (n=30) in table 5.

**Table5: Mortality and morbidity rate of the goats in the selected areas before and during covid-19 pandemic:**

|  |  |
| --- | --- |
| Mortality rate of the animals(%) | Morbidity rate of the animals(%) |
|  Before covid | During covid | Before covid | During covid |
| 1.4 | 0.63 | 3.03 | 2.43 |

During covid-19 mortality rate was about 0.63% which was higher (1.4%) before covid. Similar scenario seen in case of morbidity rate which was 2.43% during covid and 3.03% before covid.

**3.5 Cost and return of per goat per month in the study areas**

The table 6 illustrates total cost and return of per goat per month in the selected farms (n=30).

Total cost consists of feed cost, labor cost, treatment, medicine cost, electricity, water, others cost, interest on operating cost and fixed cost. Before covid-19 Total cost per goat per month was about Tk. 1822.26 where it was Tk. 2266.8 during Covid-19 pandemic.

**Table 6: Cost and return of per goat per month in the study areas:**

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Total cost consists of feed cost, labor cost, treatment, medicine cost, electricity, water, others cost, interest on operating cost and fixed cost. Before covid-19 Total cost per goat per month it was about Tk. 1822.26 where it was Tk. 2266.8 during covid-19 pandemic.

|  |  |  |
| --- | --- | --- |
| Cost and return  | Before covid-19 | During covid-19 |
|  | Amount (Tk) | Percentages | Amount (Tk) | Percentages |
| Cost items |  |  |  |  |
| Feed cost | roughage | 594.89 | 32.65 | 439.99 | 19.41 |
| concentrate | 434.84 | 23.86 | 579.09 | 25.55 |
| Labor cost | 306.12  | 16.80 | 429.81 | 18.96 |
| Treatment & medicine cost | 87.82 | 4.82 | 299.42 | 13.21 |
| Electricity, water & others | 128.12  | 7.03 | 128.49 | 5.67 |
| **Total variable cost (TVC)** | **1551.79** | **85.17** | **1876.8** | **82.80** |
| Depreciation of house | 243.71 |  | 347.87 |  |
| Depreciation of equipment | 26.76 |  | 42.15 |  |
| **Total fixed cost (TFC)** | **270.47** | **14.83** | **390.02** | **17.20** |
| **Total cost (A+B)** | **1822.26** | 100 | **2266.8** | 100 |
| Return items |  |  |  |  |
| From selling buck | 3750 | 40.08 | 3198.92 | 39.28 |
| From selling doe | 536.29 | 5.73 | 694.89 | 8.53 |
| From selling culled goat | 3577.96 | 38.24 | 3084.68 | 37.87 |
| From selling kids | 1491.93 | 15.95 | 1166.67 | 14.32 |
| **Total Return** | **9356.18** | 100 | **8145.16** | 100 |

Before Covid-19 Total variable cost (TVC) and Total fixed cost (TFC) were about taka 1551.79 and 270.47 which were 85.17% and 14.83% of Total cost respectively. During covid-19 TVC was about taka 1876.8 (82.80%) and TFC was about taka 390.2 (17.20%) respectively. In terms of Total return, before covid it was about 9356.28 taka per month in which 3750 taka (40.08%) came from selling buck, 536.29 taka (5.73%) from selling doe, 3577.96 taka (38.24%) from selling culled goat and 1491.93 taka (15.95%) from selling kid. During covid it was about 8145.16 taka per goat per month in which 3198.92 taka (39.28%) came from selling buck, 694.89 taka (8.53%) from selling doe, 3084.68 taka (37.87%) from selling culled goat and 1166.67 taka (14.32%) came from selling kid.

**3.6 Monthly profitability of per goat per farm**

Monthly profitability of per goat per farm in the studied farms (n=30) was shown in table 7.

**Table 7: Monthly profitability of per goat per farm in the study areas:**

|  |  |  |
| --- | --- | --- |
| **Particulars** | **Before covid-19** | **During covid-19** |
| (A) Total return (TR) | 9356.18 | 8145.16 |
| (B) Total cost (TC) | 1822.26 | 2266.8 |
| (C) Total variable cost (TVC) | 1551.79 | 1876.8 |
| (D) Gross margin (A-C) | 7804.39 | 6268.36 |
| (E) Net return (A-B) | 7533.92 | 5878.36 |
| (F) BCR (cash cost basis) (A/C) | 6.03 | 4.34 |
| (G) BCR (full cost basis) (A/B) | 5.13 | 3.59 |

Gross margin of per farm per goat before and during covid wereTk.7804.39 and Tk.6268.36, respectively. Net return per farm per goat was estimated Tk.7533.92 and Tk.5878.36 before and during covid, respectively.

BCR(Benefit cost ratio)

BCR (cash cost basis) was 6.03 in before covid and 4.34 during covid-19 effect. Benefit cost ratio (full cost basis) was 5.13 in before covid and 3.59 in during covid pandemic. It means that goat faming is profitable business in both period. But it was more profitable before covid effect than during covid-19 pandemic.

**Table 8. Paired sample test:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Variable | Mean | Std. Error | Std. deviation | 95% confidence interval | t | Degree of freedom | Sig (2- tailed) |
| Lower | Upper |
| Monthly income during covid-19 | 8416.67 | 498.32 | 2729.44 | 7397.48 | 9435.86 | -3.3974 | 29 | 0.001 |
| Monthly income before covid-19 | 9668.06 | 565.74 | 3098.68 | 8510.99 | 10825.12 | 29 |
| Difference | -1251.38 | 368.33 | 2017.45 | -2004.71 | -498.06 | 29 |

In table 8 Paired t test was used to comparison the mean value of monthly income of farm household before and during covid-19 effect. In ttable 8 mean value present the difference between the two situations (before and during covid-19 effect) and the p value is less than 0.001 for the variable which indicates that there is a significant relationship between the monthly income from goat production before and during covid-19 in the selected farms. The mean value of monthly income between 2020 and 2019 is -1251.38, indication of a negative impact on profitability and a lower income during the covid-19 scenario.

**Discussion**

Table 1 shows the socio-economic factors related to goat production. Data were collected from 30 respondents about their socio-economic condition related to goat production which, including age of the farmers, family size, dependent members, education, occupation, monthly family income, training and experience of farming. Table 4 indicates that the highest proportion (53.33%) of the farmers were in the middle age category whereas, 30% belonging to young aged and 16.67% to old aged in the study area. The results of this study are similar with Rahman et al., (2012), where they reported that 45.3% farmers were in the middle age category, 16 and 38.7 percent farmers were in young and old age category, respectively. Table 1 also shows the average family size of the respondents where majority(76.67%) of farmers had small sized family, 13.33% had medium sized and 10% had large sized family. The results of this study were similar with Rahman et al., (2012), where they reported that 44% farmers had small sized, 38% medium sized and 18 farmers large sized family. The average family size 7.77 of the respondents in the study area was higher than that of the national average of 4.9 (BBS, 2008). Among the total respondents, 10% had primary, 46.67% had secondary and 43.33% had higher secondary level of education (Table 1). The results of this study are not similar with (Begum et al., 2007), where they reported that 20.0% farmer’s illiterate, 40.0%, 30.0% and 10.0% farmers in primary, secondary and above the secondary level of education, respectively.

Before covid-19 the farmers had 8.76% local breed and 8.33% cross breed in their farm which is also similar with Hassan *et al* (2007). During covid-19 situation average number of local breed and cross breed turned into 7.61 and 6.74 respectively. In case of buck, doe and kid the percentages were 4.39, 4.76, 3.45, respectively before covid which turned into 3.83, 4.31,2.68 percent during pandemic. During pandemic maximum number of local and cross breed reared by the farms was 22 and 26 where these were lower (18 and 24) before covid-19(Hassan *et al.*2007).

Results indicated that average quantity of feed intake by each goat per month was 31.2 kg in case of roughage and 8.21 kg in case of concentrate before covid-19. The results also agree with Krik *et al.* (2000). During pandemic average intake lessen 17.07 kg in case of roughage and increased up to 12.97 kg in case of concentrate. It is because unavailability of green fodder due to pandemic when farmers had to feed the goats with concentrate type of feeding Arif *et al (2020).*

Table 4 illustrates average price (taka) of per kg feed before and during covid-19. Before pandemic average price of per kg roughage including green fodder was 12.42 taka per kg and concentrate was 37.74 taka per kg. Almost similar results found in Afroz,, 2007 where average price of green fodder purchased by farmers was 11.26 taka and concentrate was 5.25 taka.

The cost of production of goat consisted of variable costs and fixed costs. Under variable costs, the cost of various inputs such as purchase of goats, feed cost (purchased and home produced), veterinary charges, repairing of shed, breeding charges, miscellaneous costs (transport costs for purchase and sale of goats, purchase of feeding and drinking pots etc.). The fixed costs included depreciation of goat houses and equipment and interest on fixed cost. The value of goat purchased during the year were considered as variable costs. The costs of rearing goats presented in Table 3. The monthly average cost incurred for rearing goats was Tk 1822.26 before covid-19 which is similar with the findings of Sayeed, et al where monthly average cost of per goat were 1627.83 Tk. During covid-19 this cost raised into 2266.8 Tk per goat which is 444.54 Tk higher than that of before pandemic.

**CHAPTER-IV**

**PROBLEM AND SUGGESTION**

**4.1 Problem faced by goat farmers during covid-19 situation**

Different problems faced by the dairy farm owners due to covid-19 effect in the study area as well as problem indices and order of ranking is presented in Table 8. The result revealed that about more than half (60%) of the goat farm owners were claimed the problem of high feed cost due to covid-19 and this problem had problem indices of 106 and ranked 1.

**Table 9: Problem faced by goat farmers during covid-19 situation:**

|  |  |  |  |
| --- | --- | --- | --- |
| Problems | Extent of problem | Problem indices | Rank |
| Very low =1 | Low =2 | Moderate =3 | High =4 |
| Fall down monthly income of the family members | 0 (0) | 5 (16.67) | 10 (33.33) | 15 (50) | 100 | 5 |
| Unavailability of the green fodder at the surrounding region | 2 (6.67) | 5 (16.67) | 12(40) | 11(36.67) | 92 | 8 |
| High cost of feeding | 0 (0) | 2 (6.67) | 10 (33.33) | 18 (60) | 106 | 1 |
| Restriction of movement and social distancing have led to an absence of labor | 0 (0) | 4 (13.33) | 12 (40) | 14 (46.67) | 100 | 5 |
| Increase labor cost | 0 (0) | 6 (20) | 18 (60) | 6 (20) | 90 | 8 |
| High treatment cost |  0 (0) | 9 (30) | 12 (40) | 9 (30) | 90 | 8 |
| Insufficient and inadequate veterinary services | 0 (0) | 11 (36.67) | 6 (20) | 13 (43.33) | 92 | 7 |
| Lack of vaccination and deworming facilities | 13 (43.33) | 13 (43.33) | 4 (13.33) | 0 (0) | 51 | 12 |
| Decline of the consumption of goat meat due to pandemic | 0 (0) | 9 (30) | 17 (56.67) | 14 (46.67) | 51 | 12 |
| Fall down of production | 0 (0) | 4 (13.33) | 16 (53.33) | 10 (33.33) | 96 | 6 |
| Constraint of the marketing of the kid and adult goat | 0 (0) | 6 (20) | 16 (53.33) | 8 (26.67) | 92 | 7 |
| High disease prevalence | 3 (10) | 18 (60) | 9 (30) | 0 (0) | 66 | 10 |
| Wholesale price fall due to pandemic | 0 (0) | 0 (0) | 17 (56.67) | 13 (43.33) | 103 | 3 |
| Difficulty of slaughtering of goats due to lack of slaughter house | 10 (33.33) | 15 (50) | 5 (16.67) | 0 (0) | 55 | 11 |
| Lack of credit facility | 0 (0) | 0 (0) | 16 (53.33) | 14 (46.67) | 104 | 2 |
| Decreased market demand of goat meat (closing of restaurants, market, university etc) | 0 (0) | 3 (10) | 13 (43.33) | 14 (46.67) | 101 | 4 |
| Household members lost their jobs | 5 (16.67) | 12 (40) | 13 (43.33) | 0 (0) | 68 | 9 |
| Lack of storage facilities of feed | 12 (40) | 11 (36.67) | 7 (23.33) | 0 (0) | 55 | 11 |
| Lack of government assistance | 0 (0) | 1 (3.33) | 18 (60) | 11 (36.67) | 100 | 5 |

Next in rank and problem indices is lack of credit facility of small scale goat farming. Wholesale price of goat fall due to covid-19 ranked 3 in the table and this problem had problem indices of 103. Least claimed problems were inadequate slaughtering facility and lack of storage facilities of feed and these problems both had problem indices of 55. Besides those problems some farmers reported individual problems like lack of training facility, poor return from goat, lack of communication during pandemic, no established supply chain etc. Ali and Anwar (1987) and Hossain et al., (2016), found that high feed cost and shortage of animal feed were the greatest problems of the farmers for rearing cattle. Sarker (2014), reported that unavailability and high cost of feed, lack of training facilities, disorganized marketing system and motivation of the farmers were the problems for goat rearing.

**Suggestion**

To overcome these problems it is essential to support farmers to continue the production cycle, flourish the market demand and use alternative supply chains in order to block and tackle the emerging threats facing the goat marketing channels in the crisis period.

Proper utilizations of digital technologies for networking among stakeholders and rapid information sharing, along with the use of other agricultural technologies for hygiene and cost-effective farm management, could help in overcoming the impacts of any further disaster like Covid-19. For sustainable capacity building, the government could introduce evidence-based strategies with the implementation of goat and livestock development projects that could cover the emerging needs of the future.

**CHAPTER-V**

**Conclusion**

The COVID-19 pandemic highlights that we exist in a global community. From a single city, it spread to 188 countries across the world and infected 30 million people by September 18, 2020. Decades of modeling pandemics predicted potential consequences, but COVID-19's impact on the food supply chain, and specifically livestock production was unexpected. The similar effect of pandemic found on goat production system in the studied area. But Goat farming is a great opportunity for the rural people and youth as a means of income generation. Socioeconomic development might be achieved with the help of household goat farming. It would be really very helpful for income generation, women empowerment, and fill up nutritional gap for the ruralfamily. Socio-economic position on subsidiary occupation, monthly household income and expenditure, cash in hand, savings with bank, household assets, number of school going children, monthly consumption of meat, vegetables, milk and fish, sources of drinking water, condition of latrines and health status of farmers were improved and the annual cost for treatment is reduced after adopting farming. Since most of the people irrespective of caste and religion prefer goat and meat, its demand is and price is gone up. To meet up this demand regarding the pandemic situation, reported problems should be taken in concern. In addition to that, the government could develop long term, sustainable strategies and projects through multi-sectoral engagement to ensure further capacity building of goat farmers and other stakeholders.

**Limitations of the study**

There were some limitations in my study. The mentionable limitations during data collection from the farmers were;

1. The study period was limited. So collected data only represent the incidents happened during that period of time.
2. The study area restricted to a particular district, for this reason the findings may not reflect the whole country.
3. The data collected from small number of farms because of the ongoing pandemic situation and for the restriction of movement.
4. There was limited recording system in goat farms under study as a result it was difficult to select valid data.
5. Some of the farmers were not cooperative to give information.

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**Biography**

Syeda Subrina Akhter, daughter of Farid Uddin Akhter and Shaheen Zannat. She is an intern veterinary doctor under the Faculty of Veterinary Medicine (FVM) in Chattogram Veterinary and Animal Sciences University (CVASU). She passed her Secondary School Certificate (SSC) Examination from Dr. Khastagir Government Girls’ High School, Chattogram in 2012 and Higher Secondary School Certificate (HSC) from Govt. Hazi Mohammad Mohsin College, Chattogram in 2014. In future she would like to work in the field of Veterinary Epidemiology and Zoonotic diseases and Animal welfare those take public health significance in the world regarding One Health framework.