

# **Study of backyard goat rearing in rural areas of Durgapur in Netrokona District**



**A production report submitted in partial satisfaction of the  
requirement for the Degree of Doctor of Veterinary Medicine (DVM)**

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# Study of backyard goat rearing in rural areas of Durgapur in Netrokona District



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## ABSTRACT

The study investigated the performance of goats and livelihood generated through backyard goat rearing in nine different villages in Durgapur, Netrokona District, Bangladesh, for about 1 month. The data uses a pre-configured questionnaire containing information on the demographic and socioeconomic status of household farmers, livestock, age, sexual maturity, litter size, weight, housing system, grazing, breeding objectives, vaccination and deworming history, and production record. The average birth weight was 0.79 kg, the weaning weight was 3.93 kg, the mature weight was 21.82kg, and the average weight gain was 140 g in the growing stage. Participants reported an average monthly income of approximately BDT 20,173.08 (mean), with a standard deviation of BDT 4,444.52. Mortality among livestock was reported by 21.15% of participants, with the remaining 78.85% not facing such losses. Regarding deworming practices, 50.00% of participants indicated following recommended deworming procedures, and only 6 farmers vaccinated their goats. Housing, feeding, and breeding were maintained on most of the farms, but health care and biosecurity needed to be better. Rooted in the intricate fabric of rural Bangladesh, this study's insights call for targeted interventions that acknowledge the unique context and priorities of the community, fostering sustainable economic upliftment and resilience. Through the multifaceted prism of goat rearing, this research champions the enduring spirit of rural farmers and their transformative role in shaping Bangladesh's evolving rural landscape.

**Keywords:** Goat farming; goat production; backyard farming; socioeconomic status; sustainable development.

## 1. INTRODUCTION

Nestled within the serene expanse of the rural landscapes of Bangladesh, the study titled "Study of Backyard Goat Rearing in Rural Areas of Durgapur in Netrokona District" embarks on a compelling exploration of a practice that holds both historical echoes and contemporary promise (Hossain et al., 2022). Against the backdrop of sprawling fields and meandering footpaths, a resurgence unfolds as rural communities embrace the realm of backyard goat rearing (Thangavel et al., 2018). With a lineage steeped in the annals of the nation's agrarian history, goats have been enduring cornerstones of rural sustenance, contributing nourishment through their meat, milk, and hides (Mahfuz et al., 2018). This study takes root at the confluence of Bangladesh's diverse climatic tapestry and the tenacity of indigenous goat breeds, crafting an inquiry into a practice seamlessly enmeshed with local ecological and economic rhythms. Situated in the Durgapur Upazila of the Netrokona District, this research endeavors to delve into the multifaceted dimensions of backyard goat rearing – a symbiosis of tradition and innovation, subsistence and prosperity. Beneath the statistics that accentuate Bangladesh's production of 130,000 tons of goat meat, 1.31 million tons of goat milk, and 42,000 tons of fresh skin, is a narrative that underscores the nation's reliance on goats as integral components of rural livelihoods (Sayeedl et al., 2004). This reliance is echoed in the upward trajectory of goat populations, surging by 10% annually from 1970 to 2003, even as cattle populations waned (Rana & Moniruzzaman, 2023). Amid this intricate landscape, backyard farming households emerge as pivotal custodians of this transformative practice, re-calibrating gender dynamics as they embrace care giving roles while simultaneously charting pathways towards economic autonomy and social agency (Bashar et al., 2020; Gamit et al., 2020). The study untangles the multifarious threads of backyard goat rearing as a catalyst for rural women empowerment, recognizing the challenges they face in accessing resources and decision-making spheres.

Yet, within this narrative, there lies untapped potential. Despite Bangladesh's substantial goat population, the efficiency of production requires further exploration, positioning this

study at the juncture of optimizing practices and catalyzing growth (Siddiki et al., 2021). Here, the indomitable Black Bengal goat breed emerges as the vanguard, persevering through climatic and resource-related adversities to contribute significantly to both economic stability and the nation's socioeconomic fabric. Beyond mere sustenance, these goats exemplify resilience and progress, thriving even in arid terrain and consuming household scraps to fuel their ascent. As this study unfurls, it illuminates the intricacies of backyard goat rearing and champions the rural farmers who drive this endeavor, redefining their roles and amplifying their voices within the tapestry of Bangladesh's evolving rural landscape. The study holds critical importance as it delves into the confluence of historical legacy, ecological dynamics, and contemporary aspirations within the practice. By shedding light on the enduring tradition of goat rearing, the study preserves cultural heritage while revealing its economic and ecological resilience, particularly through indigenous breeds like the Black Bengal. Moreover, the study's exploration of gender dynamics underscores how goat rearing can empower rural farmers economically and socially. Addressing production efficiency and optimal practices further aligns the study with national food security and economic stability goals. Ultimately, this research contributes to a holistic understanding of how this practice shapes sustainable rural development and transforms the socio-economic fabric of Bangladesh's rural landscapes.

**Hypothesis:** The practice of backyard goat rearing positively correlates with increased agency and empowerment among rural farmers as they navigate caregiving roles while contributing to economic stability and decision-making spheres within their households.

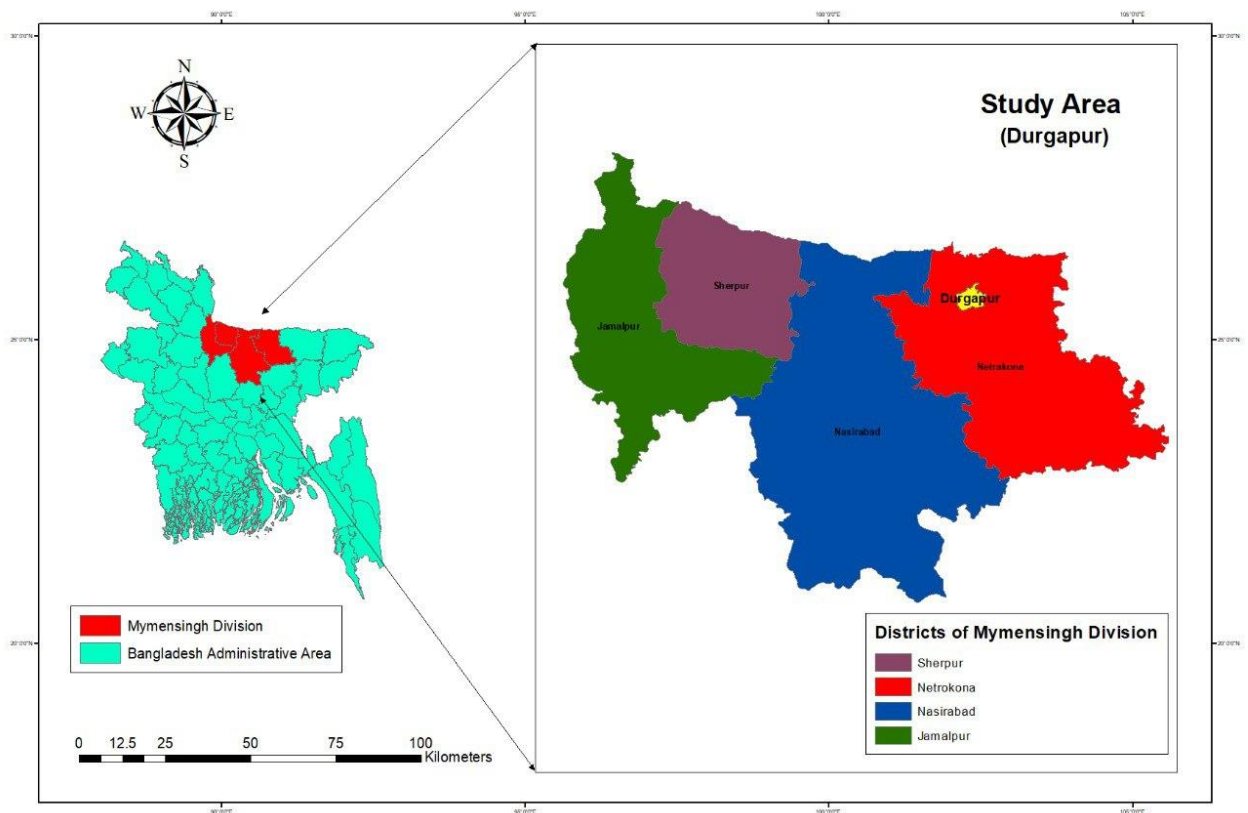
### ***1.1. Aims & Objectives of the study:***

1. To investigate the socioeconomic dynamics underpinning backyard goat rearing in the rural areas of Durgapur, Netrokona District.
2. To study the production and reproduction parameters of goat backyard goat rearing in the rural areas of Durgapur, Netrokona District.

## 2. MATERIALS AND METHODS

### 2.1. Study Area and Planning:

The study was conducted in Durgapur Upazila, Netrokona, a rural area in northern Bangladesh. The area is known for its high concentration of small-scale farmers who rely on native goat breeds for their livelihoods and source of protein. The study was planned to collect data on the demographic, economical condition and breed characteristics of locally reared goat populations in the area, with the aim of identifying opportunities for improving their productivity and sustainability.



**Figure 1: Study area (Durgapur Upazila, Netrokona)**

The study was designed to be conducted over a period of one month, during which time a questionnaire was administered to farmers who owned goats in the study area. At first, by a pilot questionnaire survey, the quality and data availability according to questions were



ensured. Finally, the questionnaire was adjusted accordingly. For selecting the farmers, a systematic sampling technique was used. The researcher then selected every fifth household that raised backyard goats, starting from the first house near them and skipping the three houses in between. This method ensured that the sample was representative of the population and reduced the potential for bias in the selection process. The sample size was determined using a power analysis, with a confidence level of 95% and a margin of error of 5%.

### ***2.2. Data Management:***

The data collected from the questionnaire was entered into an Excel file in Microsoft Office 365, which was used for data management and cleaning. The data were checked for completeness and accuracy, and any missing or inconsistent values were corrected or removed. The soft data was stored on a password-protected laptop to ensure the security and confidentiality of the data.

### ***2.3. Statistical Analysis:***

The data collected from the questionnaire were analyzed using descriptive statistics, which were used to summarize the demographic and breeding characteristics of the goat populations. The data were analyzed using STATA 17, which is a statistical software package commonly used for data analysis in the social sciences. The results were reported using appropriate tables and figures, and the significance level for all statistical tests was set at  $p < 0.05$ .

### **3. RESULT AND DISCUSSION**

The distribution of respondents across various unions in the study area, encompassing Bakoljora, Birishiri, Chandigor, Durgapur, Kakoirgora, and Kullagora. Of the 52 participants, Durgapur exhibited the highest representation (40.38%), followed by Chandigor (26.92%), Birishiri (11.54%), Kakoirgora (9.62%), Bakoljora (3.85%), and Kullagora (7.69%). Factors like population size, accessibility or specific local conditions could influence these variations in union participation. The differential participation rates highlight potential regional influences that warrant further investigation to comprehend the underlying dynamics driving the observed patterns. Such insights can contribute to a more nuanced interpretation of subsequent analyses, shedding light on the potential implications and applications of the study's findings within the context of the study area.

Table 1 illustrates the distribution of participants based on their occupations. The study encompassed various occupations, including day labor, farmer, fisherman, housewife and livestock cum agricultural farmer, petty trader, service holder, skilled laborer, and student. Among the participants, the most prominent occupational group was farmers, constituting 34.62% of the sample, followed by housewives (17.31%) and petty traders (17.31%). These findings underscore the varied economic activities within the study area.

**Table 1: Occupation of household farm owners**

<b>Occupation</b>	<b>Freq.</b>	<b>Percent</b>	<b>Cum.</b>
Day labor	3	5.77	5.77
Farmer	18	34.62	40.38
Fisherman	1	1.92	42.31
Housewife	9	17.31	59.62
Livestock cum agro farmer	6	11.54	71.15
Petty trader	9	17.31	88.46
Service holder	2	3.85	92.31
Skilled laborer	1	1.92	94.23
Student	3	5.77	100
Total	52	100	

Table 2 presents the distribution of respondents based on marital status and educational level. Regarding marital status, the overwhelming majority of participants were married (94.23%), while a smaller proportion were unmarried (5.77%). This distribution highlights the predominance of married individuals within the study cohort, which can have implications for family dynamics and social roles.

In terms of educational attainment, participants exhibited varying levels of education. The largest group had received primary education (53.85%), followed by those with no formal education (34.62%). A smaller number had secondary education (7.69%), and even fewer had higher secondary education (3.85%). These findings underscore the importance of considering demographic characteristics such as marital status and educational level in the analysis of study results. Marital status can influence perspectives, responsibilities, and decision-making dynamics, while educational level can shape knowledge acquisition and engagement. Understanding these demographic factors enhances the depth of interpretation in subsequent analyses, enriching the contextual understanding of how perceptions and behaviors relate to different aspects of participants' lives.

**Table 2: Marital and Educational status of household farmers**

<b>Variables</b>	<b>Category</b>	<b>Freq.</b>	<b>Percent</b>	<b>Cum.</b>
Marital status	Unmarried	3	5.77	5.77
	Married	49	94.23	100.00
Educational level	No formal education	18	34.62	34.62
	Primary	28	53.85	88.46
	Secondary	4	7.69	96.15
	Higher Secondary	2	3.85	100.00

Table 3 presents descriptive statistics for key financial variables, shedding light on the economic aspects of the participants' lives. Participants reported an average monthly income of approximately BDT 20,173.08 (mean), with a standard deviation of BDT 4,444.52. The income distribution ranged from a minimum of BDT 15,000 to a maximum of BDT 35,000. Similarly, participants reported an average monthly cost of around BDT 18,528.85, with a standard deviation of BDT 4,398.54. The costs ranged from a minimum of BDT 2,000 to a maximum of BDT 30,000. Regarding income from the previous year, the average reported income was BDT 17,903.85, accompanied by a notable standard deviation of BDT 9,414.76. Income in the previous year ranged from a minimum of BDT 7,000 to a maximum of BDT 50,000. Additionally, participants reported an average cost incurred behind income generation of BDT 4,636.54, with a standard deviation of BDT 4,115.02. The costs ranged from a minimum of BDT 1,000 to a maximum of BDT 18,000.

**Table 3: Income and Cost comparison**

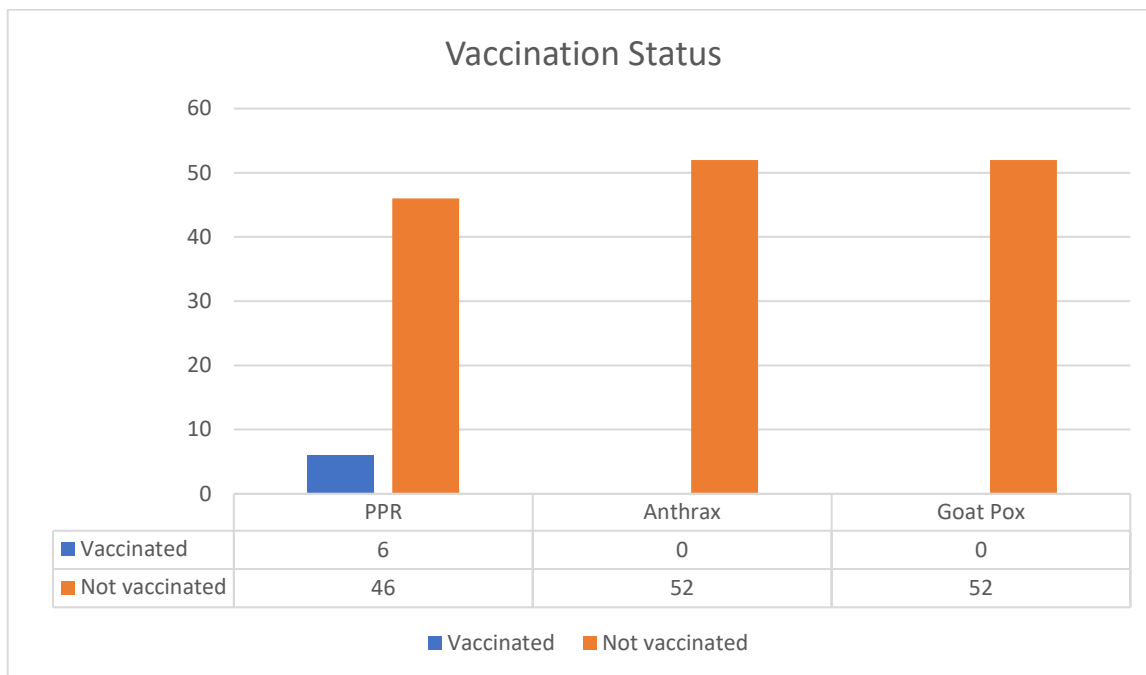
<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. dev.</b>	<b>Min</b>	<b>Max</b>
Income (monthly)	52	20173.08	4444.521	15000	35000
Cost (monthly)	52	18528.85	4398.544	2000	30000
Income from farm (yearly)	52	17903.85	9414.756	7000	50000
Cost behind farm (yearly)	52	4636.538	4115.015	1000	18000

Table 4 outlines the distribution of participants based on various livestock-related variables, including breed, housing system, feeding system, ventilation maintenance, cleanliness, bio-security of the shed, and scheduled vaccination. For the breed of livestock, the majority of participants (84.62%) reported owning Black Bengal goats, while a smaller number owned Crossbreed goats (13.46%), and only one participant owned Jamunapari goats (1.92%). Regarding housing systems, the majority of participants employed the Kacha (traditional) housing system (78.85%), while a significant proportion used the Semi Paka (semi-permanent) housing system (21.15%). In terms of feeding systems, 69.23% of participants practiced grazing, while 30.77% employed a combination of stall feeding and grazing. The assessment of proper ventilation revealed that 80.77% of participants reported not having well-ventilated sheds, while 19.23% maintained well-ventilated conditions. In terms of cleanliness, the majority of participants reported not maintaining cleanliness in their livestock sheds (92.31%), while a smaller proportion reported maintaining cleanliness (7.69%).

Interestingly, no participants reported maintaining bio-security measures for their livestock sheds (0%), indicating a potential gap in bio-security practices. Scheduled vaccination was practiced by 11.54% of participants, while the majority (88.46%) did not engage in scheduled vaccination.

**Table 4: Farm management and Bio-security**

<b>Variables</b>	<b>Category</b>	<b>Freq.</b>	<b>Percent (%)</b>	<b>Cum.</b>
Breed	Black Bengal	44	84.62	84.62
	Jamunapari	1	1.92	86.54
	Cross	7	13.46	100.00
Housing system	Kacha	41	78.85	78.85
	Semi paka	11	21.15	100.00
Feeding system	Grazing	36	69.23	69.23
	Stall feeding and grazing	16	30.77	100.00
Proper ventilation maintained	Well ventilated	10	19.23	19.23
	Not well ventilated	42	80.77	100.00
Cleanliness	Not clean	48	92.31	92.31
	Clean	4	7.69	100.00
Bio-security of shed	Maintained	0	0	0
	Not maintained	52	100	100.00
Scheduled vaccinated	Vaccinated	6	11.54	11.54
	Not vaccinated	46	88.46	100.00



**Figure 2: Vaccination status (PPR, Anthrax, Goat Pox)**

Graph 1 shows the vaccination status, where only 6 goats received the PPR vaccine. This could be due to the area being rural and no livestock service provider in the area. Also, the need for more knowledge about vaccination could be much higher.

Table 5 comprehensively overviews various livestock-related practices and interactions within the community. The responses offer insights into the behaviors and choices of participants, shedding light on their livestock management strategies and interactions with the environment. Regarding deworming practices, 50.00% of participants indicated following recommended deworming procedures, while an equal proportion chose not to implement such practices. Grazing areas exhibited a diverse distribution, with 50.00% of participants using plain land, 25.00% using fallow land, 9.62% using embankments, and 15.38% using roadside areas for grazing. Cultivating fodder for livestock was practiced by a minority of participants (17.31%), while the majority (82.69%) did not engage in this practice. Training received in livestock management was reported by 7.69% of

participants, while the majority (92.31%) had not undergone such training. Concerning disease occurrences, 57.69% of participants reported having experienced livestock diseases in the last 6 months, while 42.31% had not encountered such issues. Mortality among livestock was reported by 21.15% of participants, with the remaining 78.85% not facing such losses. A small proportion (1.92%) reported contact with wild animals, indicating limited interactions. Visiting veterinary hospitals was reported by 34.62% of participants, reflecting engagement with veterinary services, while 65.38% did not avail themselves of such visits. Regarding livestock trade, participants consistently engaged with the local market, purchasing animals (100.00%) and selling animals (100.00%). Additionally, 90.38% of participants sold animal products to the local market, while a smaller proportion (9.62%) sold to neighboring houses. The multifaceted information from Table 6 highlights the intricate web of practices and interactions related to livestock management and trade. Each category's varying choices and behaviors reflect the diverse strategies participants employ to manage their livestock and engage with their surroundings. Understanding these practices contributes to a holistic comprehension of the community's livelihood system, offering insight into their priorities, challenges, and opportunities. These insights are crucial for designing targeted interventions that align with the existing practices and needs of the community, ensuring effective and sustainable outcomes.



**Table 5: Animal and common practiced data of the farms**

<b>Variables</b>	<b>Category</b>	<b>Frequency</b>	<b>Percent (%)</b>	<b>Cumulative</b>
Recommended deworming	Yes	26	50.00	50.00
	No	26	50.00	100.00
Grazing area	Plain land	26	50.00	50.00
	Fallow land	12	25.00	75.00
	Embankment	5	9.62	84.62
	Roadside	8	15.38	100.00
Cultivate fodder	Yes	9	17.31	17.31
	No	43	82.69	100.00
Training received	Yes	4	7.69	7.69
	No	48	92.31	100.00
Disease in last 6 months	Yes	30	57.69	57.69
	No	22	42.31	100.00
Mortality	Yes	11	21.15	21.15
	No	41	78.85	100.00
Contact with wild animals	Yes	1	1.92	1.92
	No	51	98.08	100.00
Visit veterinary hospital	Yes	18	34.62	43.62
	No	34	65.38	100.00
Buy animal from	Local market	52	100.00	100.00
Sell animal to	Local market	52	100.00	100.00
Sell animal product to	Local market	47	90.38	90.38
	Neighboring	5	9.62	100.00

**Table 6: Weight of goats in different age categories**

<b>Variable</b>	<b>Observations</b>	<b>Mean</b>	<b>Std. dev.</b>	<b>Min</b>	<b>Max</b>
Birth weight (kg)	52	0.79	0.42	0.85	1.25
Weaning weight (kg)	52	3.93	2.05	4.5	5.5
Mature weight (kg)	52	21.82	2.34	18	28
Weight gain (kg/day)	52	0.14	0.02	0.11	0.18

The study's results unveil significant insights into the weight-related characteristics of the goat population under investigation. In terms of birth weight, the observed data of 52 individuals showcases a mean of 0.79 kg, with a relatively moderate standard deviation of 0.42 kg. The birth weight distribution spans from a minimum of 0.85 kg to a maximum of 1.25 kg. Transitioning to weaning weight, the mean value of 3.93 kg signifies the growth trajectory, although the substantial standard deviation of 2.05 kg highlights a notable variance within the population. Weaning weight varies between 4.5 kg as the minimum and 5.5 kg as the maximum. Mature weight, which serves as a marker of overall growth and development, exhibits a mean of 21.82 kg, accompanied by a standard deviation of 2.34 kg. This range spans from 18 kg as the lowest mature weight to 28 kg as the highest. Notably, the weight gain per day, a crucial metric for assessing growth rates, demonstrates a mean of 0.14 kg/day, with a relatively low standard deviation of 0.02 kg/day. The weight gain per day oscillates between 0.11 kg/day as the minimum and 0.18 kg/day as the maximum. These findings collectively provide a comprehensive understanding of the goat population's growth dynamics, indicative of the varied growth rates and potential within the study area. The substantial range in weights underscores the intrinsic variability in goat growth trajectories, likely influenced by factors such as genetics, nutrition, and management practices. Such insights are pivotal for formulating targeted strategies to optimize growth and productivity, ensuring sustainable development within the context of the local goat-rearing practices.

#### **4. CONCLUSION**

To understand the viability of backyard goat rearing as a sustainable livelihood option for household farmers in rural Bangladesh, this study delved into a comprehensive examination of diverse socioeconomic and livestock-related variables. The insightful analysis illuminated the intricate dynamics within the community's livelihood system. As the findings revealed the diverse practices, preferences, and challenges encountered by farmers engaged in goat rearing, the potential of this pursuit as a means of empowerment and economic upliftment became evident. From the nuanced variations in livestock management practices to the economic considerations and demographic diversity, the study's results underpin the importance of tailored interventions that recognize and leverage rural Bangladeshi household farmer's unique context and priorities. The culmination of these insights underscores the potential of backyard goat rearing to contribute meaningfully to rural farmer's livelihoods in rural Bangladesh, fostering economic resilience and empowerment within the community.

## **LIMITATIONS**

1. The study was confined to a specific region, potentially limiting the generalization of the findings to broader contexts within and beyond the study area.
2. The one-month duration of the study might not account for seasonal variations that could impact growth, production, and other factors.
3. Reliance on self-reported data from farmers may introduce biases and inaccuracies due to recall and reporting errors.
4. The study predominantly focused on demographic and breeding aspects, omitting other potential factors such as socioeconomic, cultural, and environmental influences on productivity.
5. The study's scope did not allow for an in-depth exploration of the socioeconomic implications and impacts of native goat farming.

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## **ACKNOWLEDGEMENT**

The author wishes to acknowledge the immeasurable mercy of Almighty ‘God’, the foremost authority and supreme ruler of the universe, who permits the author to complete this work successfully. The author expresses his deepest perception of gratitude, respect, and immense gratefulness to his honorable teacher and supervisor, Dr. Md. Kabirul Islam Khan, Professor, Department of Genetics and Animal Breeding, Faculty of Veterinary Medicine, Chattogram Veterinary and Animal Sciences University, for his academic guidance, generous supervision, precious advice, constant inspiration, radical investigation and effective judgment in all steps of the study. The author expresses his genuine gratitude and respect to the honorable teacher Prof. Dr. Mohammad Lutfur Rahman, Dean, Faculty of Veterinary Medicine, and Prof. Dr. A. K. M. Saifuddin, Director of External Affairs, Chattogram Veterinary and Animal Sciences University for proceeding with this internship program.

## APPENDIX Questionnaire

Demographic Data	Answer
Name	
Address	
Age	
Education Level	
Occupation	
Monthly Income	
Number of Family Members	

### **Economic Data:**

No.	Questions	Answer
1.	What is the total land area that you own? (in hectares)	
2.	What percentage of your land is used for goat rearing?	
3.	What is your total investment in backyard goat rearing? (in Taka)	
4.	What is your annual income from goat rearing? (in Taka)	
5.	What percentage of your total income comes from goat rearing?	
6.	What is the average monthly cost of living for your family? (in Taka)	
7.	What is the percentage of your monthly income spent on goat rearing?	
8.	Do you have access to credit or loans for goat rearing?	



**Goat Rearing Data:**

No.	Question	Answer Options
1.	Number of goats reared	
2.	Farming experience (Year)	
3.	Breed(s) of goat reared	
4.	Average prolificacy of your goats (number of kids per breeding)	
5.	Common diseases faced by your goats	
6.	Average cost for goat feed per month (in Taka)	
7.	Type of housing provided for goats	<input type="checkbox"/> Shed <input type="checkbox"/> Open area <input type="checkbox"/> Others (please specify): _____
8.	Average cost for goat housing per month (in Taka)	
9.	Average cost for goat treatment per month (in Taka)	
10.	Other expenses related to goat rearing per month (in Taka)	
11.	Average income generated from selling goats per year (in Taka)	
12.	Mortality rate of your goats	
13.	What do you do with the goat milk?	<input type="checkbox"/> Sell <input type="checkbox"/> Consume <input type="checkbox"/> Others (please specify): _____
14.	Average price of goat milk (per liter in Taka)	
15.	Average income generated from consuming goat products per year (in Taka)	
16.	What are the major challenges you face in goat rearing?	
17.	What limitations do you face in goat rearing?	
18.	Have you considered expanding your goat rearing business?	<input type="checkbox"/> Yes <input type="checkbox"/> No
19.	If yes, what steps are you taking to expand your business?	
20.	What support or assistance do you require to improve your goat rearing business?	

## **BIOGRAPHY**

This is Raquibul Hasan Raquib, the youngest child of Abdul Aziz and Ayesha Khatun. He is pursuing Doctor of Veterinary Medicine (DVM) at Chattogram Veterinary and Animal Sciences University under the Faculty of Veterinary Medicine. He passed the Secondary School Certificate Examination (SSC) in 2015 from Sushung Adarsha Bidya Niketon, Durgapur, Netrokona, with a GPA of 5.00. He also passed the Higher Secondary Certificate Examination (HSC) in 2017 from the Shahid Syed Nazrul Islam College, Mymensingh, with a GPA of 4.75 out of 5.00. Currently, he is doing his year-long internship. He is highly enthusiastic about his field of study and aims to develop practical skills and knowledge to prepare for the modern era of science.