Study on the Performances of Rural Household Duck Rearing System at Some Selected Areas at Bakergonj Upazilla in Barishal

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LIST OF ABBREVIATIONS:

Abbreviations	Elaboration
DLS	Department of Livestock Services
BLRI	Bangladesh Livestock Research Institute
BRAC	Bangladesh Rural Advance Committee
Kg.	Kilogram
No	Number
TK.	Taka
Govt.	Government
RFLDC	Regional Fisheries and Livestock Development component.
NGO	Non-Government organization.
SLDP	Small holder Livestock Development Project.

ABSTRACT

The purpose of this study was to analyze the status of household duck rearing systems in a few selected locations in Bangladesh (Bakergonj upazilla, Barishal district). Aside from that, the farmers' socioeconomic conditions, the feeding system and availability of feed for raising ducks, the productivity of scavenging ducks, and the profitability of raising those ducks were all assessed. A questionnaire was used to collect information from 30 households (mainly women) who raise ducks in the research region using a direct interview method. The purpose of this study was to analyze the status of household duck rearing systems in a few selected locations in Bangladesh (Bakergonj upazilla, Barishal district). Duck rearing is primarily led by women in their 30s and beyond (68 percent) in the research region. Women grantees had varying levels of education, ranging from primary to higher secondary. The majority of duck farmers (30 percent) were determined to be uneducated. Fifty-five percent of farmers have access to arable land (Average 21 decimal). The average farm size was 5 acres, and the number of ducks lost was due to a variety of factors. Around 18% of farmers raised ducks with hens. The majority of farmers kept their ducks in bamboo cages, while the others kept them in houses constructed of wood, tin, straw, or mud. The proportion of mature ducks was highest (75.2%) in October–December and lowest (44.2%) in April–June. Ducks begin laying at 6 months of age and lay an average of 116 eggs per year. Egg production peaks in the winter, particularly following crop harvesting. Household consumption of ducks is greatest (52.3 percent) in Bakergonj Upazilla than in any other part of Bangladesh during the winter. Large farmers ate the most duck eggs (30.2%), while landless farmers ate the least (15.4%). Because it is readily available and inexpensive, around 78 percent of respondents fed their birds a mixture of boiled rice and rice polish. Ninety-two percent of those polled stated they do not spend money on extra feed. The death rate was 18 percent, with winter being the greatest (28 percent). Ducks were vaccinated against duck plague on days 15 to 31 and 35 to 46 for the first dose and 35 to 46 for the booster dose. Approximately 63% of homes sold eggs to the local market, whereas 28% sold to the bepari. The average annual spending and income per duck were 186.15 Tk and 360.69 Tk, respectively, while the average annual expenditure and income per family were 1346.9 Tk and 2635.09 Tk.

Key words: Household Duck, Scavenging, Feeding System, Profitability.

CHAPTER-I

INTRODUCTION

Poultry production is an effective tool for bridging the supply-demand gap for animal protein in developing countries (Alders and Pym, 2009). Duck, among other poultry species, can be a potential source of meat and eggs in rural Bangladesh (Hoque et al., 2010). Bangladesh has been reported to practice chicken and duck rearing, or both. The majority of farmers in Bangladesh raise 77.29 percent of chickens and 84.41 percent of ducks, respectively, of the total population (Hague et al., 2001). However, duck production in Bangladesh has steadily increased, rising from 25.8 million in 2001 to 38.1 million in 2006. (BBS, 2007Bangladesh has the third largest duck population after China and Indonesia, with 54.03 million ducks (DLS, 2018). Recent estimates of the duck population range from 8% to 25% of the total chicken population (DLS, 2020). The variation also clearly demonstrates domestic and small-scale duck production in Bangladesh. In Bangladesh, various types of duck rearing systems are available. It is divided into three categories: household (scavenging), semi-intensive (semi-scavenging), and intensive duck farming (Khan, 2013).

Household duck farming or scavenging systems do not provide feed to the ducks, whereas semi-scavenging systems do. However, the presence of large bodies of water such as Beel and Hawor has a significant impact on the first two duck rearing systems. Duck intensive farming is less common and is mostly run by the government to help small-scale farmers (Hoque et al., 2011). The house ducks forage in nearby large bodies of water for snails, duck weed, fish, and algae. Feed availability varies from season to season.

In Bangladesh, the distribution of duck populations varies by district. Char Fasson on the Island of Bhola in Barisal division, the sub-districts of Burichang in Chattogram division,

Tarail and Netrakona in Dhaka division, and Kalia in Khulna division are the pick pocket areas of duck production.

Wetlands and Char are abundant in the Barishal districts. Over the last five years, duck production has increased dramatically in sectors other than household duck farming. Many small-scale duck farmers establish their duck farms near bodies of water. The duck management system is a semi-scavenging duck farming system. The farm size ranges from 500 to 3000 ducks. In the Bakergonj upazila of the Barishal districts, there are more than 200 registered duck farms. Unfortunately, the performance and profitability of the semi-scavenging farming system have not yet been evaluated. A small study was carried out, primarily in the Haor area of Noakhali and Sylhet.

As a result, the current study was carried out to better understand the management and production performance of ducks in this farm's semi-scavenging system.

Bakergonj Upazilla in the Barishal district is significant in terms of backyard duck practice in Bangladesh, owing to the availability of natural feed during harvesting season and the availability of ponds and other waterlogged lands for duck foraging. It is a densely populated Upazilla where cattle, buffalo, sheep, goats, poultry, and ducks are traditionally reared. This coastal Upazilla has a significant amount of low land that is rich in natural feed. A large number of households practice backyard ducking as a traditional practice. Human development programmers have identified the backyard duck as a focus area. So, the focus of this research is on the existing backyard duck rearing system, with the goal of paving the way for the development of backyard duck into a sustainable income-generating activity for rural households. There is little information available about the domestic duck. Improvement programmers cannot be identified due to a lack of accurate data on backyard deck production.This study was conducted to provide data that will aid in overcoming a lack of

knowledge regarding the production and utilization patterns of family ducks, as well as the income generated in rural households through duck rearing. A short study titled "**Study on the Performances of Rural Household Duck Rearing System at some selected areas at Bakergonj Upazilla under Barishal District**" was undertaken with a view to know the economic performanceand livelihood importance, as well as partially fulfilling the academic degree as aninternship production report requirements.

Objectives of the study:

The overall objectives of the study are to know the performances and limitations of the rural household level duck rearing system in the study areas.The specific objectives of the study are as follows:

To describe the socioeconomics characteristics of the duck rearing household owners.

To comprehend the household levelrural duck production, management and feeding system with feed availability in the study area.

To assess the productivity of scavenging rural ducks and the profitability of rearing ducks in various numbers.

To identify the major problems and prospects of the household duck farming system in the study.

CHAPTER-II

MATERIALS AND METHODS

Statement of the Study

The study was conducted in some selected areas of Bangladesh (7 different villages of Bakergonj upazilla under Barishal district) using direct interview schedules (Appendix) developed primarily for the collection of information on duck rearing practices, particularly feeds and feeding systems at the farm level. Farmer does not keep records or accounts of farm operations. As a result, a survey was conducted, and the necessary data was collected via direct interviewing and analyzed.

Study period: The study was started from 20 March' to 15 May 2021.

Selection of the location and study area

The study areas were selected randomly from 7 villages under Bakergonj upazilla, district on the basis of availability of duck farms and communication facilities. The Study Includes The Bakergonj Upazila (The Smallest Administrative Unit) Of Barishal Districts. Geographically The Area has Large Water Source (River). North side Barishal sadar, South side Patuakhali district East side Nalchiti upazilla, West - Baufol Upazilla. Bakergonj distance from Dhaka-142 km and from Barishal 22 Km. The Peoples of This Area Mainly Earn Their Livelihood on Agriculture. Most of The Family Raised Duck Under Backyard System But Some Young People Take The Initiative of Small Scale Duck Farming.

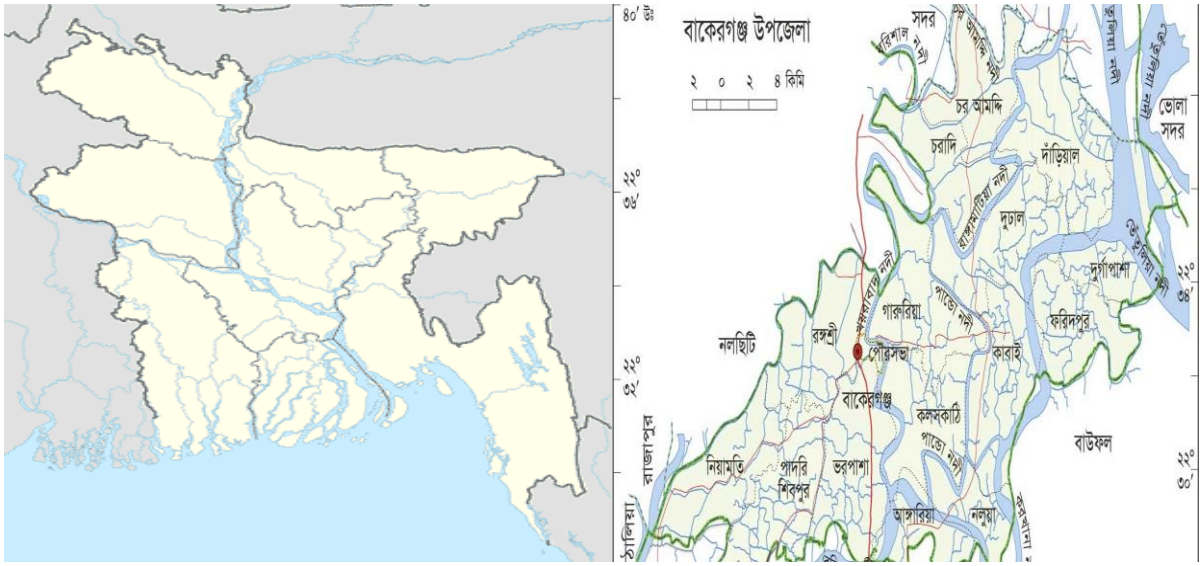

Fig-1: Study and Survey Area

Selection of sample and sampling technique

In total of 30 households duck farms were selected randomly from 7 villages Vorpasha union. Simple random sampling technique was followed for collection of necessary data to obtain the specific objectives of the study. Households was selected for study having at least 3 ducks reared under scavenging condition was included in the study.

Method of data collection

Data were collected through direct interview schedule by the researcher himself with a preformed questionnaire (**attached in the appendix**). The schedule was prepared containing relevant with the set objectives of study.

Structure of family ducks and its production by season (percent):

The proportion of mature ducks was highest (74.2%) in October-December and lowest (45.2%) in April-June. The highest number of ducklings (27.6 percent) was discovered in April-June, indicating that farmers hatched eggs for ducklings prior to the start of the rainy season. There were no ducklings available from October to December because the farmers do not hatch duck eggs.

Fig-3: Duck raising by the rural woman

Incase of ducks, eggs production was highest and lowest in January-March and July-September respectively. It was observed that the total egg production per bird was higher in ducks than in chickens (Sazzad 1986 and Huque et. al. 1990).

Breeding and Hatching system

Natural mating is done for rural ducks. Maintenance of standard 1:5 drake and duck ratio was reported by most of the farmers. Most of the farmers said that sexual maturity at deshi breeds of ducks attained between 5.5-6 months and average egg production per year 116 eggs/year.

Structure of family ducks and its production by season-Utilization pattern and age group of ducks in different households

Rural household duck rearing system followed by the owners of ducks:

Housing:

Around 67% of the farmers housed their duck in bamboo made cage and rest 33% of the farmers kept their ducks in house made of wood, tin, straw or mud. 88% of the farmers used single or combinations of materials (straw, Ash, rice husk) as litter where the rest of the farmers kept ducks without using any litter. Around 19% of the farmers reared duck with hen.

Fig-5: Various types of housing for duck that are practiced by household farmers.

Feeding and Watering system:

Because it is readily available and inexpensive, 78 percent of respondents fed their birds a mixture of boil rice and rice polish. The majority of households fed their ducklings snail, duck weed, khoi, and other plants. 92 percent of those polled said they do not spend money on supplementary feed. The remaining 8% spend a significant amount of money on supplementary feed. The frequency with which ducks were fed varied from two to three times per day.

Fig-6: Feeding of duck and duckling

Ponds, dogi (transitory fallow land), paddy fields, Nula, and ditches were observed to be the most common places for ducks to scavenge around households. There was a wide variety of scavenging feed available, including snails, duck weed, earthworms, crabs, frogs, land and water insets. Ducks graze in marshy land for about 8-9 months of the year.

Fig-7: Natural feeding system of ducks

Table- 9 shows different types of feed ingredient used by the farmers and their percentage.

It can be found that most of the house hold farmers use rice polish (34%) and a small no of farmers use wheat bran (1%) as duck feed.

Vaccination and Medication:

Most households express that ducks are most affected during the winter season, and they used to slaughter ducks when they were sick. They don't do much for the sick duck. 58 percent of farmers say duck plague and duck cholera are the main causes of death, while the rest say they were unaware of the diseases and couldn't identify them. A significant number of households do not vaccinate their ducks on a regular basis due to vaccine shortages and a lack of awareness.

Data collection

Different data such as literary level of the duck farmers, yearly income level of the duck farmers, land holding sizes of the farm owners, Duck distribution and Distribution of ducks according to breed,

Structure of family ducks and its production by season (percent), Breeding and Hatching system, profitability, marketing system etc, are collected during the study areas.

Statistical analyses

All collected data are put in the excel and analyzed statistically (average, mean, percentage)

CHAPTER - III

RESULTS AND DISCUSSION

Socio-economic status of the duck owners:

Literary level of the duck farmers:

Table-1: Literacy level of the duck reared of the studied area.

Literacy level	No. of households(N=30)	Percentage
Illiterate	9	30%
Primary	12	40%
Secondary	7	23.33%
Higher Secondary	2	6.66%
ALL	30	100%

Source: Field survey, 2021

In addition to this, the following fig-4 also showsthe highest no of households lie in the literacy group primary (40%) and lowest in the literacy group higher secondary (6.66%).

Yearly income level of the duck farmers:

Table-2 shows that maximum households lie in the income group of Tk. (40000-80000).

Table-2: Yearly income level of the duck farmers:

Income level	No. of households (N=30)	Percentage
Up to Tk. 20000	9	30%
Tk. (40000-60000)	7	23.33%
Tk. (60000-80000)	5	16.66%
Tk. (80000-100000)	5	16.66%
Above Tk. 100000	4	13.33%
ALL	30	100.00%

Source: Field survey, 2021

Land holding sizes of the farm owners

Table.3: Landholding sizes of the duck farmers:

Land holding size	No. of households (N=30)	Percentage
Land less farmers (0-0.5 acre)	15	50.00%
Small and marginal farmers (0.5-1 acre)	9	30.00%
Medium farmers (1-1.5 acre)	4	13.34%
Large farmers (Above 1.5 acre)	2	6.66%
ALL	30	100.00%

Source: Field survey, 2021

Land utilization pattern of the farmers

The land utilization patterns are categorized as cultivable, residential and non-cultivable land. The estimated average land areas per house hold is 0.506 acre. Table-4 shows that 55.33% of the land is utilized under cultivation.

Table-4: Average land utilization pattern of the households.

Type of land	Land holding size(acre)	Percentage
Cultivable	0.28	55.33
Residential	0.156	30.83
Non-cultivable	0.07	13.84
Total	0.506	100.00

Source: Field survey, 2021

Duck distribution:

Table-5: Average no of ducks for different landholding farmers:

Land holding size	Average no. of ducks
Land less farmers (0.0.49 acre)	9
Small & marginal farmers (0.5-1 acre)	7
Medium farmers (1-1.5 acre)	7
Large farmers (Above 1.5 acre)	7

Source: Field survey, 2021

Utilization pattern and age group of ducks in different households:

The percentage of duck consumption by the households is highest in Barishaland in Bakergonjupazilla it is 51.3%. Percentage of duck selling by the farmer is 48.7% (average).The highest no. of eggs (34.2%) was consumed by the large farmers, while the lowest no. of duck eggs (11.4%) was consumed by the landless farmers.

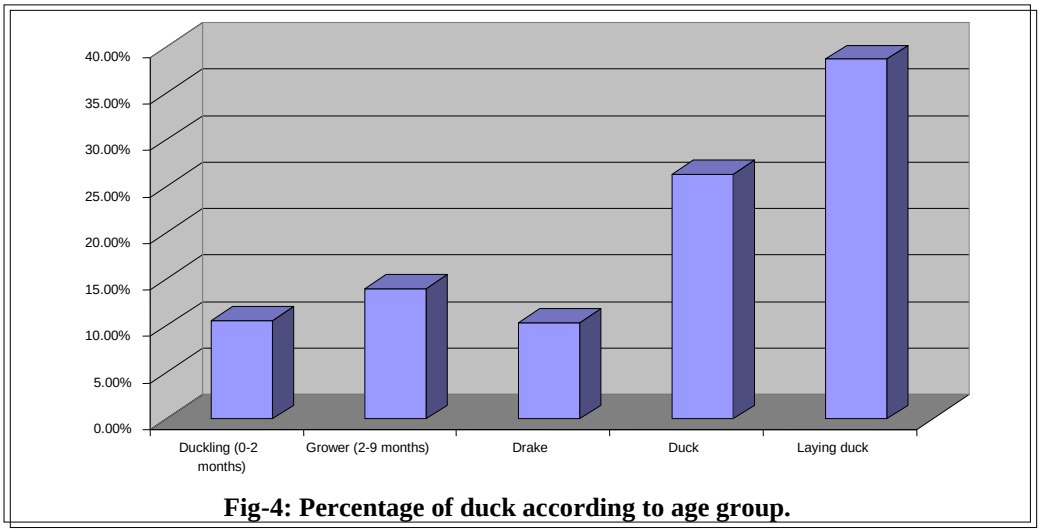

Fig-4: Percentage of duck according to age group.

The following figure showed the percentage of duck according to age group and breed. From table-7 and fig-8 it can be shows that the highest percentage of duck is laying (38.7%) and lowest percentage of ducks is drake (10.4%) in my study area.

Distribution of ducks according to breed:

Table-8: Distribution of ducks according to breed.

Type of Breed	Percentage
Deshi white	9.5
Deshi Black	24.2
Deshi Mix	63.8
Indian Runner	0

Khaki Campbell	0
Zending	2.5
Cross-bred	0
ALL	**100.00**

Source: Field survey, 2021

In the study areas, it revealed that, max 63.8 percent of the reared duck in the was found Deshi mix breed, Deshi black 24.2 percent and min was found Zending breed about 2.5percent.

Table- 9: Different type of feed ingredients and their percent that are used by the farmers.

Feed ingredients	Percentage
Rice polish	34%
Rice	30%
Paddy	32%
Broken rice	3%
Wheat bran	1%
Total	100%

Source: Field survey, 2021

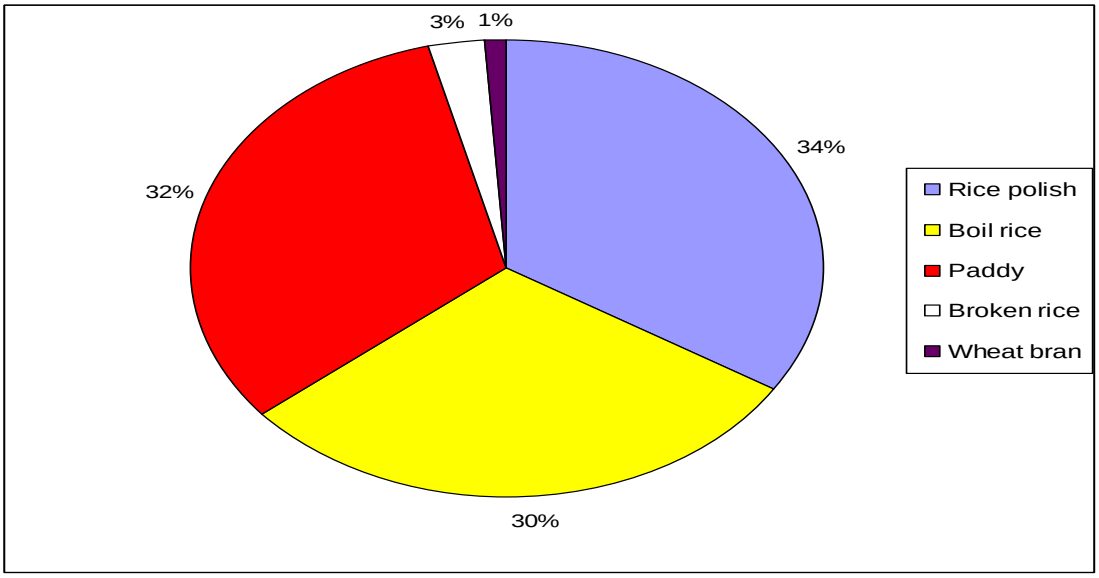

Fig-8: Use of Feed ingredient for ducks

Breeding and Hatching system:

Natural mating is done for rural ducks. Maintenance of standard 1:5 drake and duck ratio was reported by most of the farmers. Most of the farmers said that sexual maturity at deshi breeds of ducks attained between 5.5-6 months and average egg production per year 116 eggs/year. It was also found that egg production reaches peak during winter especially after crop

harvesting season. Mortality rate of duck is high in winter, and due to less vaccination mortality varies from place to place.

Table-10: Average age of first laying with season of year at peak production and egg production per year with mortality rate.

Age at first laying (Months)	Season of year at peak production	Egg production per/Year	Mortality
6	**Winter**	**116**	**18%**

Source: Field survey, 2021

It was found that most of the house holder use natural procedure of hatching by using hen and brooding also by hen itself. But hardly select artificial brooding. Hatchability is near about 74 %.

Profitability of Duck rearing system:

Family-wise and per bird annual gross cost.

Average annual expenditures and economic return of rearing ducks in the study regions is shows in table-12, 13, 14 and 15. The farmers with 3-20 ducks usually do not hire any labor and work by themselves. It was found from the data that the average cost for ducklings, feed, housing, vaccination & medication was 34.72, 106.20, 21.14 &15.92 respectively.

Table-12: Family wise & per bird annual gross cost (average):

Item	**Family wise annual cost (Tk.)**		**Per bird annual cost (Tk.)**	
	Gross cost	Depreciation cost (10%)	Gross cost	Depreciation cost (10%)
Duckling cost	193.58	-	34.72	-
Feed cost	948.44	-	106.20	-
Medication & vaccination	125.424	-	15.92	-
Total gross cost	1267.44		156.84	
Housing cost	156.68	15.68	21.14	2.1
Total deprecation cost	-	15.68	-	2.1

Source: Field survey, 2021

Table-13: Family wise and per bird average annual gross cost.

Family wise annual net cost (Tk.)			**Per duck annual net cost (Tk.)**		
Duck rearing			**Duck rearing**		
Gross cost	Dep. cost (10%)	Total cost	Gross cost	Depreciation cost (10%)	Total Cost
1267.44	15.68	**1284.12**	156.84	2.1	**158.94**

Source: Field survey, 2021

Family Wise and per bird Gross and Net Profitability:

Table-14 showed that family wise & per bird total income is 2140.09 &331.69 Tk. respectively. The average egg production of the Deshi duck and duck under study population is 116 per duck per year. Moreover, the cost for production and maintenance of ducks is very low because of feeding on natural resources. Duck meat is of high demand in winter season in my study area. The study result as per household and per bird finally found the gross and net return and BCR were **Tk. 872.65, Tk. 823.19, 1.06 and Tk. 162.85 Tk. 131.54, 1.23** respectively. So all considering these economic performance indexes rural duck farming in the study is a profitable livestock enterprises as a farm business.

Table-14: Family wise and per bird average gross return (GR).

Particulars of item	**Family wise annual GR**	**Per duck annual GR**
Return from selling eggs	1531.37	238.82
Return from selling ducks	608.72	92.87
Gross Return(GR)	**2140.09**	**331.69**
Return over Gross Cost	872.65	162.85
Net Return over TC	823.19	131.54
Benefit Cost Ratio (BCR) (Full cost basis)	1.06	1.23

Source: Field survey, 2021

CHAPTER-IV

SUMMERY AND CONCLUSION

If the problems that villagers face can be solved, duck rearing may be more profitable than chicken rearing. It has also been discovered that indigenous ducks are more accustomed to the regular feeding management provided by small farmers and landless farmers. It is now clear that we can alleviate poverty by rearing ducks in a more modified manner. According to the study, there are significant opportunities for improving duck production in rural Bangladesh. Regular vaccination and the use of a balanced diet can have a positive impact on duck rearing, resulting in high-quality products for human consumption while also reducing nutritional deficiencies and poverty in the country. Farm families have expressed a desire for duck rearing training. The current study's findings support the overall view that the current status of household duck rearing in Bakergonj upazilla is considered to be on par with the rest of the country. In some cases, specific production was reported to be higher than expected. However, the introduction of training and input supply with scientific housing, feeding, and breeding management, as well as creating more extended provision of health care and disease prevention by undertaking positive initiatives and patronization from both government and NGO, will undoubtedly improve the current status of rearing ducks with the livelihood of Bakergonj upazilla under Barishal district in Bangladesh engaged in scavenging duck rearing.

CHAPTER-V

PROBLEMS AND RECOMMENDATIONS

PROBLEMS FACED BY THE FARMERS:

The following problems are identified in general from the response of the studied ducks rarer under the study:

A lack of financial support that could inspire farmers to become more concerned about duck rearing.

A lack of available medical resources, such as vaccination assistance and treatment of diseased birds.

A lack of improved breeds among indigenous ducks capable of providing better production performance to rearers.

A lack of awareness about duck rearing.

A lack of government oversight.

A lack of feed availability.

Because ducks are almost incapable of relying on themselves, losses from predators (Jackal, fox, etc.) are high in rural areas.

Diseases affect ducks as a result of mismanagement, such as poor diet or bedding, or overcrowding and filthy conditions common in rural areas.Duck viral hepatitis and duck plague can cause severe losses.

Ducks are poor mothers who do not incubate their eggs.

In Bangladesh, the marketing system is disorganized, making it difficult for duck farmers to market their products.

Duck meat and egg superstition reduces demand for duck eggs and meat.

RECOMMENDATIONS:

Duck rearing would have been the first choice of our village people if proper supervision were given. In order to initiate the villagers to rear duck, the following steps should be taken:

- Supply of improved indigenous ducks to the villagers.
- Provision of financial support to the duck farmers.
- Govt. patronization regarding duck rearing.
- Conduction of stable market for duck meat & eggs.
- Price stabilization should be ensured.
- Availability of ducklings should be ensured.
- Ensure available vaccine for viral diseases of duck.
- Provision of available veterinary service to the duck.

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APPENDIX

Study on the performances of Rural household duck rearing system at selected areas in Bakergonj Upazilla under Barishal District:

Questionnaire that was followed during study:

1.a) Name of the farmer:… … … …
b) Father/husband's name:… … …
c) Address:
Village:… … … … Union:… … … …
Upazila:… … … … District:… … … …
b) Occupation: Service/Agriculture/Poultry or dairy farm/Business/ Labour/Others.
2. Family details:

SL.NO	Name of the member	Relation	Age	Sex	Education	Name of association with which he/she related
1.						
2.						
3. 4.						

3. Land (acre):
a) Residential b) Cultivable c) Non-cultivable

4. Source of income:
a) Agriculture b) Service c) Business d) Duck rearing e) Poultry
f) Dairy g) Other

5. Total income of family… … … … TK/year.

6. Presence of electricity: Yes/No
7. Number of Duck

Type	Deshi			Hybrid			Crossbred
	White	Black	Mix	Indian Runner	Khaki Campbell	Zending	
Duckling (0-2m)							
Grower (2-9m)							
Drake							

Duck Laying duck							

8. Information on housing:

a) Elements of house: Bamboo/straw/tin/polyethylene /mud/wood/ Bamboo/others.
b) Place of rearing: Yard/distant from house.
c) Cleaning of house: Yes/no.
d) Type of litter used:
e) If any integrated farming-Yes/no.
f) Integrated duck & poultry rearing in a common place-Yes/no.

9. Feeding information:

a) Type of feeding-natural/artificial/both.
b) Name of ingredients in case of natural feed
… … … … … … … … … … … … … … … …
c) Source of feed:
d) Frequency of feeding:
e) Supplementary feeding:

10. Presence of marshy land: Yes/no.
If yes, what type – Dogi / haor / pond /river.

11. How many months in a year duck are grazed in marshy land:

12. Name and quantity of artificial fad ingredients

Ingredients	Quantity/duck/day		
	Duckling	Grower	Duck

13. Information on disease management of duck:

a) Regular vaccination-Yes/no
b) If yes type of vaccine:
c) Treatment of diseased duck- Yes/no
d) Govt. help in duck treatment: Yes/no
e) Name of some disease of duck-
a) b) c) d)
f) In which season duck is affected mostly: Summer Rainy Winter
g) Source of duckling: Govt. farm NGO Family Personal

14. Information on laying of duck:

a) Age at 1st laying

b) Egg production/year
c) Average egg weight
15. Marketing of eggs:
a) Where eggs are sold:
b) Approximate selling cost of egg/year:
c) Problems of selling:

d) Bird selling: /year.

16. Information on cost:
Duckling cost: Medicine:
Housing: Labors:
Vaccine: Feed:
17. Information on hatching:
a) Procedure of hatching: Natural/Artificial
b) If natural use of- duck/hen
c) Process of brooding of duckling

18. Source o money for duck rearing- Own/NGO/Govt/Others.

19. Duration of duck rearing-Through out the year/definite time of a year.

20. Problems of duck rearing:
- -
- -
- -
21. What is your future plan about duck rearing-?

Name of Interviewee Name of Interviewer
Date: Date:
Signature: Signature: