

# **Household Duck Rearing System and Their Comparative Performance Analysis: A Study at Laksam Upazila, Cumilla**

## **ABSTRACT**

The study was conducted to know the present status, existing production system of duck and assess the potentiality of duck rearing in rural areas of Cumilla district in Bangladesh. Data were collected randomly from 50 duck rearing farmers using a pre-tested interview schedule during 13<sup>th</sup> October to 12<sup>th</sup> December, 2019 from several villages under Laksam Upazila of Cumilla. Beside this, socio-economic conditions of the farmers, feeding system and availability of feed for raising ducks, productive performances of scavenging ducks and profitability of raising those ducks were evaluated. In the study area most of the farmers were women. The level of education of farmers varied from primary to higher secondary. Most of the duck rearers (65%) were found primary educated. The average farm size was 75 (Stocking Density) and it always remains variable with the duck's loss attributed to different causes. About 40% of the farmers housed their ducks in wood and tin made cage while the rest of the farmers kept ducks in house made of bamboo, tin, brick or mud. Duck reaches first laying at 6 months of age, produces average 110 eggs per year. Egg production reaches peak during winter especially after crop-harvesting season. Approximately 10% respondents said that they do not spend any money on supplementary feed. The mortality rate was 19% and it is highest in winter (27%). Duck were vaccinated against duck plague mainly. Around 80% households sold eggs to the local market and 20% sold to the bepari and others. Total annual expenditure and annual income per duck were on an average 453-taka and 1450 taka, respectively. It can be concluded that duck rearing knowledge of the farmers such as breeding, feeding, housing, prevention and control of diseases are not satisfactory of this area. Introducing of improved duck breeds/varieties, training to duck farmers, ensuring vaccination to ducks, financial and technical support to the farmers could increase the duck rearing with increased household income and employment to youth, rural women and the small-holder marginal farmers.

**Key words:** Household duck, scavenging system, Feeding practices, Farm profitability

# INTRODUCTION

Among the species of poultry duck is a potential source of meat and eggs in rural areas of Bangladesh (Hoque *et al.*, 2010). Chicken, and duck or both rearing practiced are reported in Bangladesh. There are different types of duck rearing system which can be classified as house hold (scavenging), Semi Intensive (semi scavenging) and Intensive duck farming (Khan *et al.*,2013). House hold duck farming or scavenging system provides no feed to the duck while semi scavenging system provides little of supplementary feed. However, at least the first two duck rearing system are greatly influenced by present of large water body like Beel, Hawor. The intensive farming of duck is less and mostly operated by the government to facilitate the small-scale farmer (Hoque *et al.*, 2011). The house hold duck scavenge in nearby large water bodies for snail, duck weed, fish and algae. The availability of feed varies on season to season.

The distribution of duck population varies in Bangladesh. The areas of distribution are Char Fasson on the Island of Bhola in Barisal division, the coastal areas of Lakshmipur district, Tarail and Netrakona in Mymensingh division and Kalia in Khulna division. But Cumilla district is also important for duck rearing. There are many small-scale duck farmers establish their duck farm near to water bodies. The management system of duck is moderate of semi scavenging duck farming system. The performance and profitability of the semi scavenging farming system is not yet evaluated in this area. Laksam Upazila under Cumilla district occupies an important place in respect of backyard duck practice in Bangladesh, because of having availability natural feed during harvesting season and available pond and fellow waterlogged land for duck foraging. It is a densely populated Upazila and they are traditionally practice cattle, buffalo, sheep, goat, poultry and duck rearing. There is a considerable amount of low land in this Upazila which riches with natural feed. The backyard duck has been identified as a focus area in the human development programmers. Information on the household duck is scarce. Improvement programmers cannot be checked out due to lack of accurate data on production of backyard duck. This study was undertaken to provide data, which will help to overcome the lack of knowledge regarding production and utilization patterns of family ducks and the income generated in rural households through duck rearing.

**The objectives of the study are as follows:**

- I) To evaluate the production performance and management system of scavenging ducks and profitability of rearing ducks.
- II) To determine feeding system and availability of feed for raising ducks in this locality.
- III) To identify the major constrains and prospect of duck farming

# **CHAPTER-II**

## **MATERIALS AND METHODS**

### **Study area and period:**

A month (13<sup>th</sup> october to 12<sup>th</sup> december, 2019) long study was carried out on house-hold duck rearing system in 4 selected villages of Laksam Upazila under Cumilla district. The villages were selected on the basis of availability of duck farms and communication facilities with a view to collect information on rearing practices. Twenty households duck farms were selected randomly from 4 villages under the Upazila. Households having at least 5 ducks reared under scavenging condition was included in the study. Breed, age, types of housing, feeding system, no.egg production, egg hatching, duckling brooding, socio-economic condition of the farmer were recorded in the data sheet through farmer's interview.

### **Duck characteristics:**

Breed was defined according to phenotypic characteristics of duck. Deshi, Khaki Campbell, Indian Runner and Pekin were included in this study. Sexing of ducklings was done by color, feather and vent sexing method. Age was recorded by interviewing to farmers. Vaccination, types of treatment, intervention and types of drugs used for each case, marketing system of eggs and duck were also recorded.

### **Data collection and analysis:**

Simple random sampling technique followed for collection of necessary data to obtain the specific objectives of the study. Data obtained were entered into Microsoft Excel 2010 and descriptive statistics were performed. Results were expressed as frequency number.

# CHAPTER-III

## RESULTS

### Age of duck farmers

Age of the duck farmers ranged from 25 to 70 years. The farmers were stratified into 3 Categories; namely young  $\leq 35$ , middle age 36-50 and old  $>50$  (Table 1).

### Literacy level of the duck farmers

Level of education is an important indicator for duck farming. The literary level of the studied duck reared is categorized as four groups such as illiterate, primary, secondary, higher secondary and above. In the study area, it was showed that 10% farmers were illiterate followed by 65% had primary education and rest 25% had schooling after primary education (Table 1).

### Duck rearing experience of farmers

Duck rearing experience indicates the proper management knowledge of duck farmers. The duck farmers were classified into 3 categories; namely shorter ( $<10$  years), moderate (10-20 years), and longer ( $>20$  years). (Table 1)

Characteristics	Category	Farmers No N=50	Percentage (%)
Age	young	5	10
	Middle age	28	55
	old	18	35
Education	illiterate	5	10
	primary	33	65
	Secondary and above	13	25
Rearing experience	shorter	20	40
	moderate	25	50
	longer	5	10
Land holding	Less land farmers (0-0.19 ha)	28	55
	Small and marginal farmer (0.20-0.40 ha)	13	25
	Medium farmers (1-3 ha)	8	15
	Large farmers ( $>3$ ha)	2	5

## Land holding size

Most of the duck farmer 55% were less land farmer and 25% farmer were small and marginal farmer.

## Breeds

Most of the individuals involved in this sector rear indigenous variety recognized breeds like campbell, pekin and Muscovy could be found in few states.

1. Campbell: Campbell is a breed of duck with its origin in England, was developed from crossing Mallard, Rouen and Runner ducks. They are reared for their high egg laying capacity. Campbell ducks are available in three-color varieties: khaki, dark and white. The adult weigh about 1.5 to 2.5 Kg. They are active birds with long, neck, bill, head and body.



Deshi Breed



Deshi & khaki Breed

According to the data of study area 62% farmer rear Deshi duck breed, 31% farmer rear Deshi & Khaki and 5% farmer rear only Khaki Campbell duck breed. Besides Deshi, Khaki, Runner rear 11% farmer and Deshi, Khaki, Pekin rear 6% farmer.

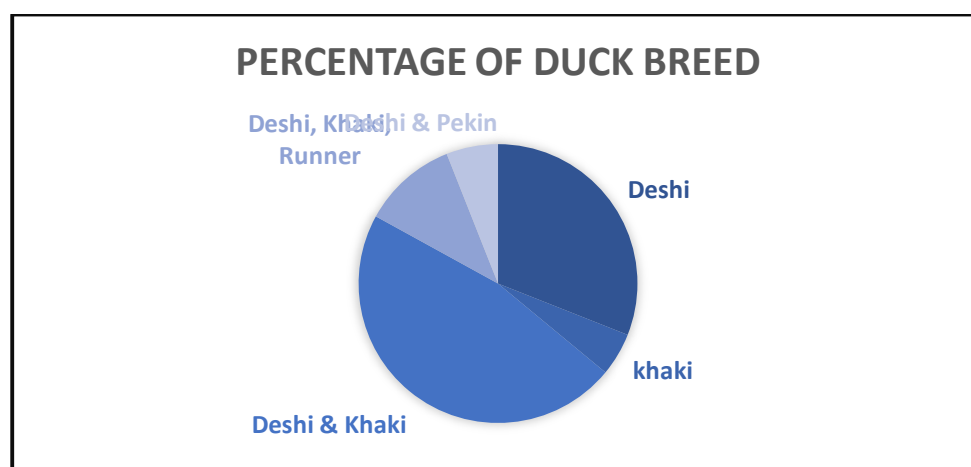


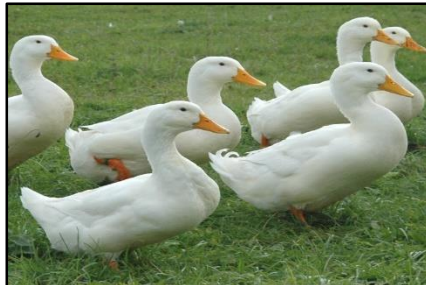
Figure-1: Percentage of duck breed reared by farmers

2. Indian Runner: The origin of these duck is believe to be from islands of Indonesia. The weight about 1.4kg to 2.3 kg and an average of 150-200 eggs per year. The colour of these ducks includes those of fawn & white, white, penciled, black, buff, and chocolate.

3. White pekin: Pekin or white pekin breed of duck reared in America finds its roots from china. They are large framed, hardy and adults weight about 4-4.5kg. Principally for they are for meat type.



Indian Runner



Pekin

**Population of duck**

According to flock size of duck, the farmers were classified into three categories; namely low producer having less than 25 number medium producer having 25 to 75 number and high producer having 75-200 number of duck. The number of duck reared by each farmer ranged from 5 to 200.

**Table 2: Population size of duck**

Category (flock size)	Farmer (50)
Small (5-25)	14
Medium (25-75)	27
Large (75-200)	9

**Percentage of duck according to age group and breed**

**Table 3: Percentage of duck according to age**

Age of ducks	Percentage
Duckling (0-2 months)	10 %
Grower (2-9 months)	15.5 %
Drake	10.5 %
Duck	27 %
Laying duck	37 %
Total	100 %

The table shows the percentage of duck according to age group and breed. From table 3, it can be shown that the highest percentage of duck is laying (37%) and lowest percentage of ducks is drake (10.5%) in the study area.

### Housing

Ducks do not need elaborate housing system; the minimum requirement would be to have a shelter and guarded free run area. The house/shelter should be well ventilated, dry and rat proof.

Housing materials used by farmers

- I) Wood & Tin- 40%
- II) Brick-15%
- III) Bamboo & soil-35%
- IV) Bamboo-8%
- V) Others-2%

### Feed and feeding of duck:

Ducks are capable of converting grains, insects, snails, plant materials, leftover food particles and pond materials into egg and meat efficiently. Commercial duck feeds are available according to age group as pellets and crumbs. Starters for up to 0-2 weeks, grower for 3-8 week old and for adults 9 to 20 weeks, then layers and breeders. Duck should always be provided with access to water, they prefer having wet feed. Feeding of ducklings under brooding should be taken care of until they get adapted, they should be provided with coarse milled cereals moistened with water initially before moving on to mash feed. No more feed that can be eaten in about 10 minutes should be fed at any time. Grit or sand and water should be available. Ducklings normally consume 12.5 kg of feed in 20 weeks.

**Table: Feed formula for campbell breed & white pekin**

Ingredients(%)	KHAKi CAMPBELL			WHITE Broiler duck		
	starter	grower	layer	starter	grower	layer
wheat	45	48	42	60	40	40
Yellow maize	-	-	10	-	29	20
De-oiled rice bran	14	25.5	6.5	-	10	-
Soyabean meal	25	15	20	25	10	20
Fish meal	10	6	10	10	6	10
Lucern left meal	2	2	2	2	2	2
Mineral mixer	2.5	2.5	2.5	2.5	2.5	2.5
Shell grit	-	-	5.5	-	-	5
D.C.P	1.0	0.5	1.0	-	-	-
Vitamin mixture	0.5	0.5	0.5	0.5	0.5	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0



**Brooding:** One of the essential management aspect to ensure growth and productive life of hatched duckling is to brood them for minimum a period of 3-4 weeks in case of artificial brooding. The space required per bird for artificial brooding ranges from 0.2-9 Sq.ft. A temperature of 30°C required for first week of brooding and is reduced accordingly every week. Usually a heat lamp of 40-100 watt is used to provide the required heating conditions, and the wattage is altered accordingly how the duck reacts. Feeders and water should be made available all the time and should be accessible to the ducklings. Under natural conditions a broody duck could brood about 10-15 ducklings.

### **Breeding and Hatching:**

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 110 per year (Table 5). 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 5: Productivity of duck in the studied area**

Parameters	Category	Farmer (%)
Sexual maturity	Early (<190 days)	80
	Moderate (190-200 d)	10
	Late (>200 days)	10
Egg production/year	Low (80-100)	35
	Medium (101-150)	45
	High (150-200)	20
Hatchability (%)	Low (<84%)	30
	Medium (84-88%)	60
	High (>88%)	

Table 5 shows the average age of first laying egg, egg production per year and Hatchability rate. It was found that most of the householder use natural procedure of hatching by using hen

### **Diseases of duck**

Duck in general are resistant to disease. They could be susceptible to viral diseases like Duck Plague and Duck Viral Hepatitis. Vaccination is the most suitable option to prevent the disease from affecting the flock. Duck Cholera caused by Pasteuralla could be treated using sulpha drugs. Botulism or food poisoning due to ingestion of bacterium from decaying plants can affect young ducks and could be treated by adding, Epsom salt which act as purgative. Aflatoxicosis which arises due to fungal infestation in feed can result in mortality over a period of time. With drawl of infected feed could result in recovery of duck.

### **Vaccine Schedule:**

S.no	Name of the vaccine	Route	Dose	Age of ducks
1	Duck cholera	subcutaneous	Duckling 1ml	3-4 weeks
			Adult 2 ml	After 1 month of previous vaccination
2	Duck plague		Adult 1 ml	8-12weeks

Most of the households said that duck are affected mostly in winter season and they used to slaughter duck due to sick. They hardly treat the sick duck. About 80% farmers said that duck plague and duck cholera are the main reasons for mortality where the rest said that, they were not aware of and could not identify the diseases. Due to lack of awareness, a considerable number of households do not vaccinate regularly to their ducks.

Controlling procedure of duck diseases were varied among farmer to farmer. Most of the farmers (55%) controlled their duck disease with medication, only 30% farmers used vaccine to prevent duck disease and rest 15% did nothing for controlling disease.

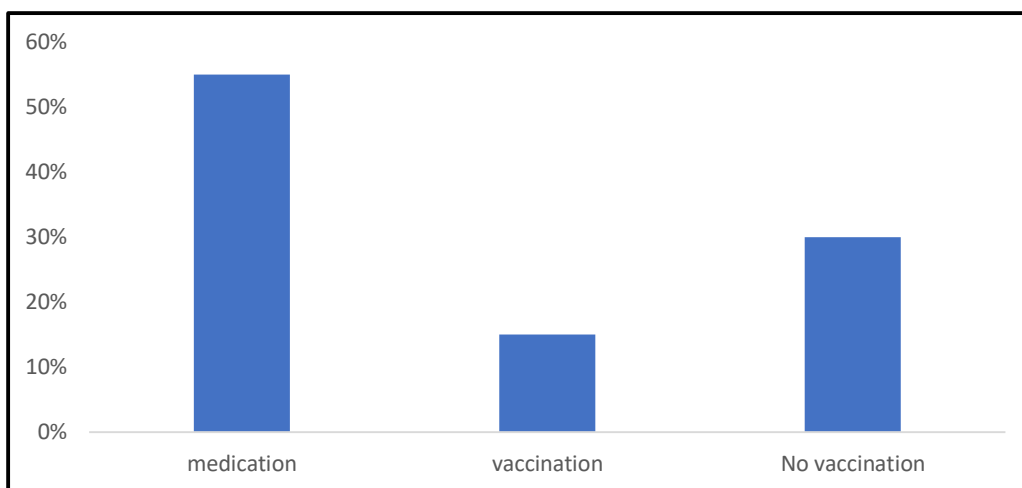


Figure: vaccination and medication status of farmer

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### Cost, return and profitability of Duck rearing:

#### I. Per bird annual gross cost:

Average annual expenditures and economic return of rearing ducks in the study regions are showed in tables 6 and 7. 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 and medication was 30.80, 342.00, 18.50 and 50.20, respectively.

**Table 6: Per bird annual gross cost (average)**

Item	Per bird annual cost (TK)	
	Gross cost	Depriciation cost (10%)
Duckling cost	35	-
Feed cost	350	-
Medication & vaccination	50	-
Housing cost	20	2
Total depreciation cost	-	2
Total gross cost	455	
Total cost	(455-2) =453	

**Per bird, gross return:**

Table shows that per bird total income is 1450 taka per year.

<b>Item</b>	<b>Per duck annual GR</b>
Return from selling eggs	1200
Return from selling duck	250
Total income	1450
Total cost	453
Net annual return	997

**Marketing of eggs and ducks**

Around 80% household's farmers sold eggs to the market and 20% sold their ducks eggs to the bepari. Duck meat has high demand in Laksam and that is why most of the household sold ducks and consumed by themselves.

## CONCLUSION

The study concluded that most of the farmers reared deshi duck. Duck rearing knowledge such as breeding, feeding, housing, prevention and control of diseases are not satisfactory of the farmers. Therefore, a need-based extension program should be introduced among the farmers giving more focus on building awareness and ability about duck production. Regular vaccination and use of balance diet can have a positive effect on duck rearing providing quality products for human consumption and reducing nutritional deficiencies and poverty of the country.

### **Recommendations to improve duck**

#### **farming:**

- a) For increasing duck meat and egg production it is needed to introduce improved duck varieties in the rural areas with informing the farmers about the advantages of rearing improved varieties. The farmers can even use improved deshi duck like deshi black and deshi white.
- b) Training is necessary to all duck farmers for better feeding and management of duck to get better production.
- c) Vaccination against common diseases of duck should be ensured.
- d) Good quality of duckling should be supplied to the farmers. Vaccine and medicine of duck should be available in market.
- e) Government should give financial and technical support to farmers for rearing duck.
- f) Duck rearing in the rural areas of Bangladesh could be a good source of income, nutrition and employment generation, especially for the unemployed youth, rural women and the small- marginal

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# APPENDIX

## QUESTIONNAIRE

### Study on house-hold duck rearing system at Laksam Upazila in Cumilla district in Bangladesh

1. a) Name of the farmer: ... ..
- b) Father/husband's name: ... ..
- c) Address:
  - Village: ... ..                      Union: ... ..
  - Upazilla: ... ..                    District: ... ..
- d) Occupation: Service / Agriculture / Business/ Labour

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
6. Presence of electricity: Yes/No
7. Number of Duck
8. Information on housing:
  - a) Elements of house: Bamboo / Straw / Tin / Polyethylene / Mud / Wood / Others
  - b) Type of rearing: Extensive/Intensive/Semi-intensive.
  - 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 – Degi /  
Pond / River

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

12. Name and quantity of artificial feed 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 1<sup>st</sup> 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 of money for duck rearing- Own/ NGO / Govt / Others

19. Duration of duck rearing: Throughout 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:.....

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The Author  
August, 2020

## **BIOGRAPHY**

*My self NAHIDUL ISLAM, the author of this production report would like to introduce as intern DR of Chattogram Veterinary and Animal Science University (CVASU) have passed four years academic career in faculty of Veterinary Medicine. I have passed SSC examination from Cumilla Zilla School at the year of 2012 and HSC from Cumilla Victoria Govt. College at the year of 2014 from Cumilla Board. As a student of Veterinary Science, the main mission and vision of my life is to do something better and creative job by dint of my academic knowledge and experience, for the development of livestock as well as well as development of economic condition of our country. This production report is the fast step to fulfil my dream.*