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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

This study was conducted to observe the indigenous ducks rearing systems in some selected areas (Companigonj upazilla under Noakhali district) of Bangladesh. Apart from this, feeding system and availability of feed for raising ducks, productive performances of scavenging ducks and profitability of raising those ducks, socio-economic condition of the farmers were also evaluated. Data were collected randomly from 20 households (specially women) by direct interview method using a questionnaire in the study area. The results revealed that most of the women (60%) were middle aged. The level of education of women beneficiaries varied from primary to higher secondary. Fifty five percent farmers had a little cultivable land (average 20 decimal). The average farm size was 7.2, and it always varies depend on the farmer. Around 17% of the farmers reared duck with hen, 68% of the farmers housed their ducks in bamboo made cage, while the rest of the farmers kept ducks in house made of wood, tin, straw or mud. The mature ducks were highest (74.2%) in October –December and lowest (45.2%) in April-June. Duck attain sexual maturity at 6 months of age, produces average 110 eggs per year. Egg production reaches peak during winter especially after crop-harvesting season. Duck consumption by the household especially in winter is highest (52.3%) in Companigong Upazilla. The highest numbers of duck eggs (32.2%) were consumed by the large farmers while the lowest numbers of eggs (12.4%) were consumed by the landless farmers. Around 78% of the respondents fed their birds with mixture of boil rice and rice polish as it is available and cheap. Ninety-two percent respondents said that they do not spend any money for supplementary feed. The mortality rate was 19% and it is highest in winter (27%). Duck was vaccinated against duck plague on day between 15 and 31 for the first and between 35 and 46 for the booster dose. Around 62% households sold eggs to the local market and 27% sold to the bepari. Total annual expenditure and annual income per duck were on an average 119.15Tk and 255.85Tk, respectively whereas family wise annual expenditure and income were 857.9Tk and 1661.09 Tk, respectively.

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

CHAPTER I

INTRODUCTION

Poultry sector is an inevitable part of agriculture that plays a substantial role in ensuring food security as well as facilitating poverty reduction. Bangladesh has a large and rapidly growing poultry sector in which ducks are considered as the most preferred poultry species after chicken for egg and meat purposes. The climate, environment and the countless water bodies of Bangladesh are favorable for duck habitation and production. Therefore, duck in Bangladesh reared by rural families and landless people, particularly who cannot afford to rear cattle or goat. Ducks have a great role in village poultry production (Farrell and Stapleton, 1986). Consumption of duck meat and eggs in the country is estimated about 30 percent of total poultry meat and egg consumption that plays important role to narrow the gap of animal protein requirement in human diet (Islam et al., 2003). However, large-scale duck farming is found particularly in the north-eastern and coastal regions of the country where the ecology of land, agro-climatic condition and natural feed resources largely influence on duck population demography (Khanum et al., 2005). Small-scale duck rearing has potential contribution to upliftment of socio-economic condition and improving the nutritional status of the rural people in Bangladesh. Total duck population in the country has been reported to be 57.75 million (DLS, 2019), of which 95 percent are of indigenous or non-descriptive type scattered throughout the country (Hoque and Sultana, 2003). In Bangladesh most of the duck are indigenous (Ahmed, 1986; Arboleda, 1990) but other most important ducks available in the country are Khaki Campbell, Indian Runner, Jinding, Pekin and their crosses. Local ducks are ubiquitous in the country and peoples are traditionally rearing them under subsistence level of management. In Companigonj Upazila, every household keep just a few ducks in association with chicken in which most of the ducks are indigenous non-descriptive, crosses and deshipati. It occupies an important place in back yard poultry practice because of having available natural feeds during harvesting season and available pond and fellow waterlogged land for duck foraging. It is a densely populated Upazilla and they are traditionally practice cattle, buffalo, sheep, goat, poultry and duck rearing. There is a considerable amount of low land in this coastal Upazilla which riches with natural feed. There for a large number of households having backyard duck in a traditional practice. The backyard duck has been identified as a focus area in the human development programmers. So, this study is on the existing backyard duck,

rearing system with the objectives to pave the way for development backyard duck into sustainable income generating activity for the rural households. Information on the indigenous duck is scarce. Improvement programmes cannot be chalked 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 understand the management system of household duck farming.
- ii. To identify the major constraints and prospect of duck farming.
- iii. To evaluate the production performance of scavenging ducks and profitability of rearing ducks in different numbers.
- iv. To determine feeding system and availability of feed for raising ducks in this locality.

CHAPTER II

MATERIALS AND METHODS

2.1: Introduction: The study was carried out in some selected areas of Bangladesh (7 different villages of Companigonj upazilla under Noakhali district) using direct interview schedules (Appendix) developed mainly for collection of information on rearing practices, especially on feeds and feeding systems of ducks at farm level. Farmer does not keep records and accounts of their operation of farm. For this reason, survey was conducted and collected required data through direct interviewing process and analyzed finally.

2.2: Study period: The study was started from 20 February' 21 to 5 April' 21.

2.3: Selection of the study area;

The study areas were selected randomly from 7 villages under Companigonj upazilla, Noakhali district on the basis of availability of duck farms and communication facilities.

2.4: Selection of sample and sampling technique:

In total of 20 households duck farms were selected randomly from 7 villager's under Companigonj upazilla. Simple random sampling technique followed for collection of necessary data to obtain the specific objectives of the study. Households having at least 3 ducks reared under scavenging condition was included in the study.

2.5: Method of data collection: Data were collected through direct interview using a questionnaire.

2.6: Location of the study area:

Companigonj is bounded by Senbgh and Daganbhuiyan upazilas on the north, Noakhali Sadar and Sandwip on the south, Sonagazi and Mirsharai on the east, Noakhali Sadar on the west. People 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.

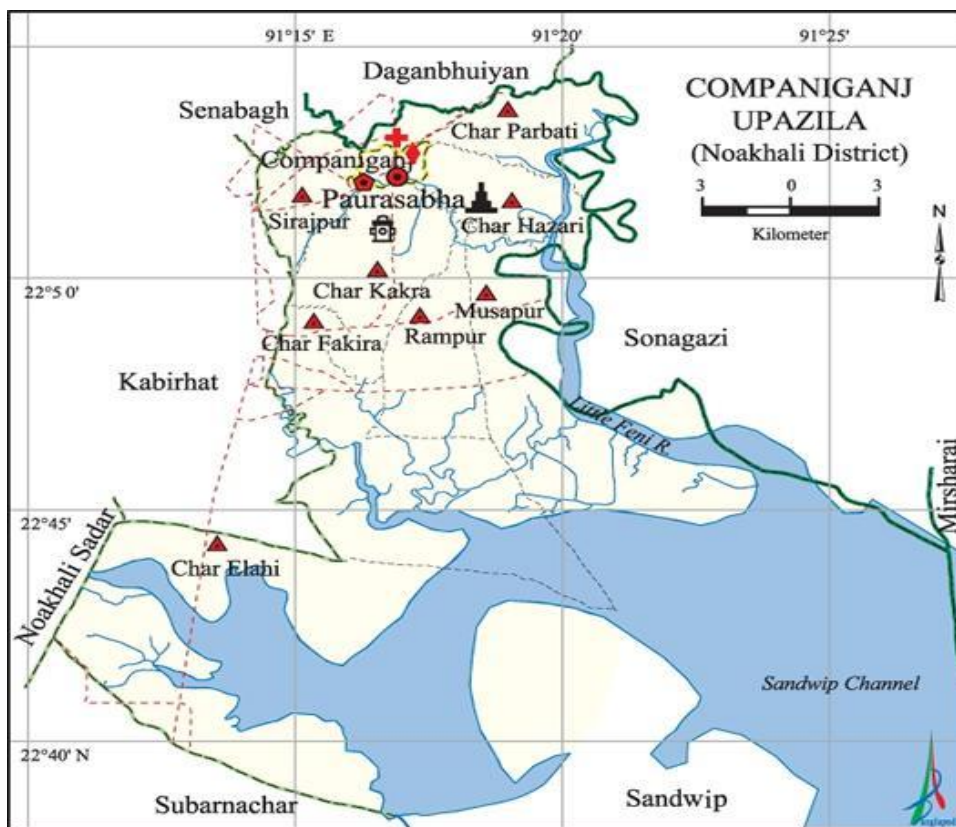


Fig 01: Study and Survey Area

CHAPTER III

RESULTS AND DISCUSSION

3.1: Socio-economic status of the duck owners:

3.1.1: Literary level of the duck farmers:

The literary level of the studied duck reared is categorized as four groups such as illiterate, primary, secondary & higher secondary. Table-1 shows the literacy level of duck rearer. From table-1, it can be found that the highest no of households lie in the literacy group primary (40%) and lowest in the literacy group higher secondary (10%).

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

Literacy level	No. of households (N=20)	Percentage
Illiterate	3	15%
Primary	8	40%
Secondary	7	35%
Higher Secondary	2	10%
Total	20	100%

3.1.2: Yearly income level of the duck farmers:

The yearly income level of the studied duck reared is categorized as three groups such as. 40,000Tk, (40000-60000) Tk and above 60,000Tk.

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

Income level	No. of households (N=20)	Percentage
Tk 40,000	3	15%
Tk. (40,000-60,000)	10	50%
Up to 60,000Tk	7	35%
Total	20	100%

3.1.3: Land holding sizes of the farm owners

Land holding sizes of the households are classified into four groups such as Landless farmers (0-0.49 acre), Small and marginal farmers (0.50-1 acre). Medium farmers (1 acre- 1.5 acre) and large farmers (Above 1.5 acre). Table-3 shows, the maximum farm owners are land less farmers group which are estimated as 55% and minimum are in the group of large farmers, which are 5%.

Table.3: Land holding sizes of the duck farmers:

Land holding size	No. of households (N=20)	Percentage
Land less farmers (0-0.49 acre)	11	55%
Small and marginal farmers (0.5-1 acre)	5	25%
Medium farmers (1-1.5 acre)	3	15%
Large farmers (Above 1.5 acre)	1	5%
Total	20	100.00%

3.1.4: 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 0.496 acre. Table-4 shows that 54.44% 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	0.27	54.44
Residential	0.146	29.43
Non-cultivable	0.08	16.13
Total	0.496	100.00

3.1.5: Duck distribution: The present duck population in Bangladesh is 57.75 million (DLS 2019). Ducks are distributed throughout the country. Beside Noakhali, Sunamgonj, Natore, Narayangonj, Feni, Magura, Faridpur, Hatia, Khulna, Bagurhat, Satkhira are duck rich area in Bangladesh.

It was found that most of the rural household has poultry, in my study area each house hold has on an average 7 ducks to rear each year. The total duck population in Companigonj upazilla is 2, 21,311(March 2021). The following table shows the average number of ducks for different landholding farmers

.Table -5: Average no of ducks for different land holding farmers:

Land holding size	Average no. of ducks
Land less farmers (0.0.49 acre)	8
Small & marginal farmers (0.5-1 acre)	7
Medium farmers (1-1.5 acre)	6
Large farmers (Above 1.5 acre)	7

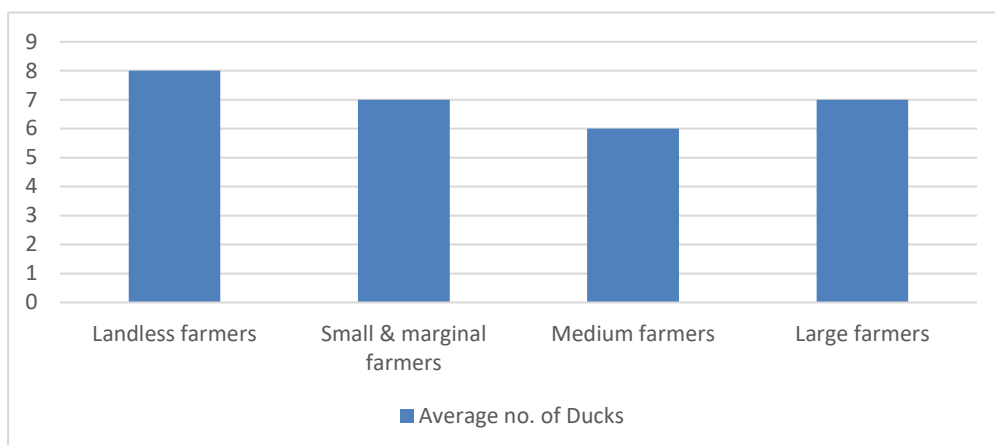


Fig 02: Average no of ducks for different land holding farmers

3. 2: Structure of family ducks and its production by season (percent):

The mature ducks were highest (74.2%) in October-December and lowest (45.2%) in April-June. The highest number of ducklings (27.6%) was found in April-June which indicates that the farmers hatched eggs for ducklings before start of rainy season. No duckling was available in the months from October to December, as the farmers do not hatch duck eggs.



Fig 03: Duck rearing by the rural woman

In case 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).

Table-6: Age wise duck rearing affinity:

Age group (years)	Percentage (%)
10-20	12%
20-30	20%
30 on wards	68%

3.3: Utilization pattern of ducks in different households:

The percentage of duck consumption by the households in Companigonj upazilla is 52.3%. Percentage of duck selling by the farmer is 47.7% (average).

The highest no. of eggs (32.2%) was consumed by the large farmers, while the lowest no. of duck eggs (12.4%) was consumed by the landless farmers.

The following table shows the percentage of duck according to age group and breed. From table-7 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.

Table-7: Percentage of ducks according to age group.

Age group	Percentage
Duckling (0-2 months)	10.6%
Grower (2-9 months)	14%
Drake	10.4%
Duck	26.3%
Laying duck	38.7%
Total	100.00%

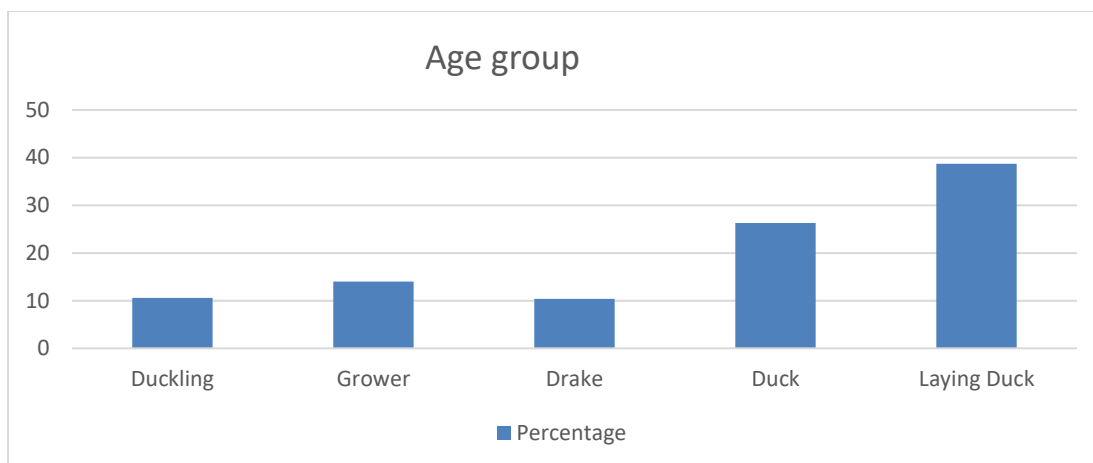


Fig 04: Percentage of ducks according to age group

Table-8: Percentage of duck according to breed:

Breed	Percentage
Deshi white	10
Deshi Black	23.2
Deshi Mix	64.8
Indian Runner	0
Khaki Campbell	0
Zending	2
Cross-bred	0
Total	100.00

3.4: Traditional management practices followed by the owners of ducks:

3.4.1: HOUSING: Around 68% of the farmers housed their duck in bamboo made cage and rest 32% of the farmers kept their ducks in house made of wood, tin, straw or mud. 89%

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 17% of the farmers reared duck with hen.



Fig 05: Various types of housing for duck that are practiced by household farmers.

3.4.2: FEEDING AND WATERING:

78% of the respondents fed their birds with mixture of boil rice and rice polish as it is available and cheap. Most of the households fed their duckling with snail, duck weed, khai etc. 92% respondents said that they do not spend any money on supplementary feed. Other 8% spend a considerable amount of money on supplementary feed. Frequency of feed offered to ducks varied from two to three times in a day.

Most common places for ducks to scavenge around household were observed to be pond, dogi (transitory fallow land), paddy field, Nula and ditch. A wide range of scavenging feed such as snail, duck weed, earthworm, crabs, frog, land and water insets were noticed to have been available. Around 8-9 months in a year duck are grazed in marshy land.

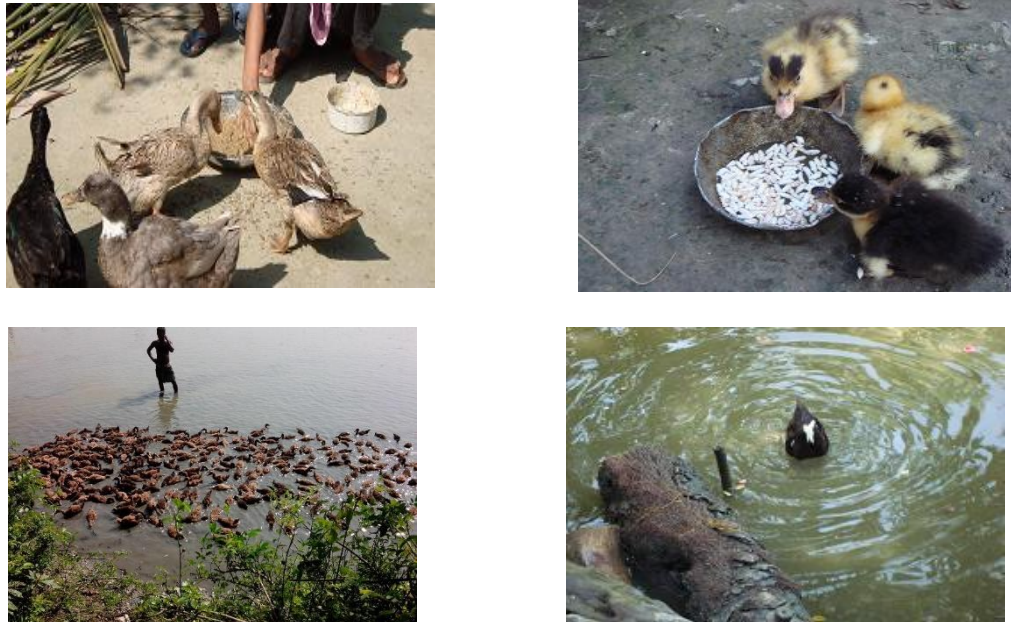


Fig 06: Natural feeding by duck

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.

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%

3.5: BREEDING AND HATCHING:

Natural mating is done for rural ducks. Maintenance of standard 1:5 drake and duck ratio were 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 110 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 Shows the average age of first laying, season of year at peak production, egg production per year and mortality rate.

Table-10: Production and Mortality of duck

Age at first laying (Months)	Season of year at peak production	Egg production per/Year	Mortality
6	Winter	110	19%



Fig 07: Hatching and caring management of duckling

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%.

3.6: Vaccination and Medication:

Most of the households express that in winter season duck are affected mostly and they used to slaughter duck when they are sick. They hardly treat the sick duck. 58% farmers express that Duck plague and duck cholera are the main reason for mortality where the rest express that of awareness a considerable number of households do not vaccinate regularly to their they were not aware of and could not identify the diseases. Due to unavailability of vaccine and lack ducks.

3.7: Cost, Return and Profitability of Duck Rearing:

3.7.1: 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-11, 12, 13 and 14. 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 22.72, 90.20, 13.14 & 4.92 respectively.

Table-11: 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%)
Duck ling cost	163.58	-	22.72	-
Feed cost	649.44	-	90.20	-
Medication & vaccination	35.424	-	4.92	-
Total gross cost	848.44		117.84	
Housing cost	94.608	9.46	13.14	1.31
Total deprecation cost	-	9.46	-	1.31

Table-12: Family wise and per bird annual Gross Cost (Average):

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
848.44	9.46	857.9	117.84	1.31	119.15

Table 13: Sale proceeds:

Tk./egg		Tk./Duck		
During Autumn	During rest of the year	Drake	Duck	Duckling
10/-	9-10/-	400/drake	350/duck	35/duckling

3.7.2: Family Wise and per bird Gross Return:

Table-14 shows that family wise & per bird total income is 1661.09 & 255.85 Tk. respectively.

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

Item	Family wise annual GR	Per duck annual GR
Return from selling eggs	1280.37	177.82
Return from selling ducks	380.72	42.87
Total income/return	1661.09	255.85
Gross cost over GR	848.44	117.84
Net cost over annual return	857.9	119.15
Cost benefit ratio	0.52	0.53

The level of education of women beneficiaries varied from primary to higher secondary. However, 15% farmers were illiterate.

Some part of the study area being low land and most of the area are highland. It is a density populated area; around 50% of the secondary households have yearly income between Tk. 40000 to Tk. 60000. Fifty five percent of the farmers had a patch of cultivable land (Average 20 decimal).

The average farm size was 7.2 and it is always remained variable with the duck's loss attributed to different causes (diseases), new introduction through own hatching, purchase and gift. Around 17% of the farmers reared ducks with hen. Though the main source of duckling is family, some NGO like Sagarika also supply duckling.

Types of duck house and day shelters with materials used in the present study area are similar to many other parts of the country. The litter used for a duck house in this study represents country wide common practices. Pond sharing for the scavenging ducks among the neighboring farmers was the common practice. Farmers supplied feed seemed not to be sufficiently balanced, so, ducks largely rely on scavenging feed for other essential nutrients.

Duck plague was the most common diseases identified in this study, like other reports (Hoque and Rahman, 2007). Ducks were vaccinated against duck plague on day between 15 and 31 for

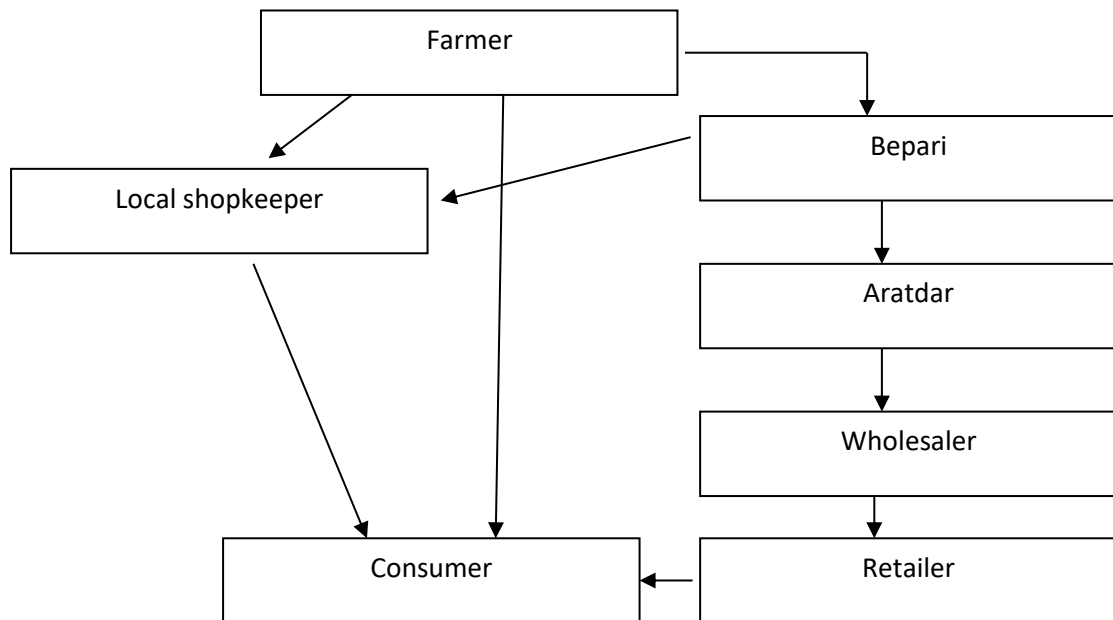
the first and between 35 and 46 for the booster dose. Loss of ducks due to infectious diseases might be controlled through intensifying the vaccination, immediate antibacterial treatment for bacterial diseases.

The average egg production of the deshi duck and duck under study population is 110 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. So, all these points contributed in the sustainability of the household duck rearing.

3.8: Marketing of eggs and ducks

Around 62% households' farmers sold eggs to the local market and 27% sold their ducks eggs to the bepari. Duck meat has high demand in Noakhali and that's why most of the households sold 5-7 ducks per year and also consumed by themselves.

Marketing channel of eggs:



CHAPTER IV

CONCLUSION

Duck rearing under village condition may be more profitable than chicken rearing. It has been also found that indigenous ducks are more habituated with the ordinary feeding management provided by the small farmers as well as landless farmers. It is now clear that by rearing duck in more modified way we can alleviate our poverty. The study indicates that there are great potentials for an improvement of duck production in rural Bangladesh. 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. Training in duck rearing has come out as felt need by the farm families. The finding of the present study support to express the overall views that the present status of house hold duck rearing in Companigonj upazilla considered being as standard as other side of the country. In some cases, particular production was reported higher than expected. However, the introduction of training and input supply with scientific housing, feeding and breeding management and creating more extended provision of health care and prevention of diseases by undertaking positive initiatives and patronization from both government and NGO will definitely improve the current status of rearing ducks with the livelihood of the households of Companigonj upazilla under Noakhali district in Bangladesh engaged in scavenging duck rearing.

CHAPTER V

PROBLEMS AND RECOMMENDATIONS

5.1: PROBLEMS FACED BY THE FARMERS:

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

1. Lack of financial support that can provide inspiration to the farmers to become conscious about duck rearing.
2. Lack of available medicinal supports such as vaccination support, treatment of diseased birds etc.
3. Lack of improved breed among the indigenous duck that can provide better production performance to the rearers.
4. Lack of consciousness about duck rearing.
5. Lack of government supervision.
6. Lack of availability of feed.
7. Ducks are almost incapable of depending themselves and hence losses from predators (Jackal, fox etc.) are high in rural condition.
8. Ducks suffer from diseases, which are due to mis-management such as poor diet or bedding or overcrowded and filthy conditions, which are prevailing, in rural condition.
9. Duck viral hepatitis and duck plague can cause severe losses.
10. Ducks tend to be poor mothers and do not incubate their eggs.
11. There is dis-organized marketing system in Bangladesh where the duck rearers face greater problems for marketing their products.
12. Superstition about duck meat and egg leads to less demand of duck eggs & meat.

5.2: 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.

REFERENCES

- Ahuja, V. & Sen. A. (2007). *Scope and space for small scale poultry production in developing countries*. Indian Institute of Management.
- Akteruzzaman, M., Miah, M. A. M., Hossain, M. M., Fattah, K. A., & Rahman, R. (2008). Impact of training on transferring livestock technology for improvement of livelihoods of the rural farmers. *Bangladesh Journal of Animal Science*, 37(2), 106-115.
- Alders, R. G., & Pym, R. A. E. (2009). Village poultry: still important to millions, eight thousand years after domestication. *World's Poultry Science Journal*, 65(02), 181-190.
- BBS (2012). Bangladesh Bureau of Statistics. Statistical Year book of Bangladesh. *Ministry of Planning, Government of the People's Republic of Bangladesh*, Dhaka. (pp. 33–34).
- Bhuiyan, M. M., Khan, M. H., Khan, M. A. H., Das, B. C., Lucky, N. S., & Uddin, M. B. (2005). A Study on the Comparative Performance of Different Breeds of Broiler Ducks under Farmer's Condition at Farming System Research and Development (FSRD) Site, Sylhet, Bangladesh. *International Journal of Poultry Science*, 4(8), 596-599.
- Chowdhury, M. M. I., Ashraf, A. Mondal, S. P. Mondol N. M. A. A. M. & Hassan, M. M. (2004). Effect of season on the hatchability of duck eggs. *International Journal of Poultry Science*, 3(6), 419-421.
- Das, S. C., Chowdhury, S. D. Khatun, M. A., Nishibori, M., Isobe, N., & Yoshimura, Y. (2008). Poultry production profile and expected future projection in Bangladesh. *World's Poultry Science Journal*, 64(01), 99-118.
- Dixon, J.A.Gibbon, D. P& Gulliver, A. (2001). *Farming systems and poverty: improving farmers' livelihoods in a changing world*. FAO.
- DLS 2007. Annual Progress Report. Department of Livestock Services. Farm gate, Dhaka.

- Dolberg F.(2008). Poultry sector country review: Bangladesh. Food and Agriculture Organization of the United Nations, Rome. 10, 2012
- Dolberg, F. (2004). Review of household poultry production as a tool in poverty reduction with focus on Bangladesh and India. *Livestock and livelihoods: challenges and opportunities for Asia in the emerging market environment. India, National Dairy Development Board, and Rome, FAO, Pro-Poor Livestock Policy Facility (South Asia Hub).*
- El-Hanoun, A. M., Rizk, R. E., Shahein, E. H. A., Hassan, N. S., & Brake, J. (2012). Effect of incubation humidity and flock age on hatchability traits and posthatch growth in Pekin ducks. *Poultry Science*, 91(9), 2390-2397.
- Etuk, I. F., Abasiokong, S. F., Ojewola, G. S. & Akomas, S. C. (2006). Carcass and organ characteristics of Muscovy ducks reared under three management systems in South Eastern Nigeria. *International Journal of Poultry Science*, 5(6), 534-537.
- Ghosh,S.Haider, N. & Khan, M. K. I. (2013). Status of Household's Ducks and their Associated Factors under Scavenging System in a Southern Area of Bangladesh. *International Journal of Natural Sciences*, 2(4), 108-111.
- Hoque, M. A., Skerratt, L. F., Cook, A. J. C., Khan, S. A., Grace, D., Alam, M. R., & Debnath, N. C. (2011).Factors limiting the health of semi-scavenging ducks in Bangladesh. *Tropical animal health and production*, 43(2), 441-450.
- Hoque, M. A., Skerratt, L. F., Rahman, M. A.Beg, A. R. A., & Debnath, N. C. (2010). Factors limiting traditional household duck production in Bangladesh. *Tropical animal health and production*, 42(7), 1579-1587.
- Huque, K. S. Sarker, M. S. K., Huque, Q. M. E., & Islam, M. N. (2001). Duck production in the Sylhet basin of Bangladesh prospects and problems. In *Proceedings of WPSA. 2nd International Poultry Show and Seminar* (pp. 16-17).

- Islam, M. S. Wahab, M. A. (2005). A review on the present status and management of mangrove wetland habitat resources in Bangladesh with emphasis on mangrove fisheries and aquaculture. In *Aquatic Biodiversity II* (pp. 165-190). Springer Netherlands.
- Kabir, F. Sultana, M. S. Mustafa, G. Rashid, M. M. O. Khan, M. S. I., & Asgar, M. A. (2007). Study on production system of existing ducks at Potuakhali district of Bangladesh and development of a self-sustainable ducks rearing model under semi-scavenging system at farmer's condition. *Journal of Biological Sciences*, 7(2), 327-332.
- Khalequzzaman, M. Mahdi, S. H. A. & Rahman, M. M. (2006). Effect of the traditional parched rice husk incubation techniques on the hatchability of duck eggs. *University Journal of Zoology, Rajshahi University*, 25, 37-40.
- Khan, S. A., Alauddin, M., Hassan, M. M., Islam, S. K. M. A., Hossain, M. B., Shaikat, A. H., & Hoque, M. A. (2012). Comparative Performance and Hematoma-Biochemical Profile of Jinding Ducks in Different Production Systems of Bangladesh. *Pakistan Veterinary Journal*, 33.
- M. A. Hamid, M. M. Hossain, M. A. R. Howdlier and S. D. Chowdhury. (1988), Egg production, feed consumption, livability and egg characteristics of Khaki Campbell, Indian runner and indigenous ducks under local condition. *Bangladesh Veterinary Journal* 22 (3-4): 89-92
- Owen, M. & Cook, W. A. (1977). Variations in body weight, wing length and condition of Mallard Ana's platyrhynchos platyrhynchos and their relationship to environmental changes. *Journal of Zoology*, 183(3), 377-395.
- Pervin, W. Chowdhury, S. D. Hasnath, M. R., Khan, M. J., Ali, M. A., & Raha, S. K. (2013). Duck production strategy and profile of duck farmers in the coastal areas of Bangladesh. *Livestock Research for Rural Development* 7,25
- Rahman, M. M. Khan, M. J. Chowdhury, S. D. & Akbar, M. A. (2009). Duck rearing system in southern coastal districts of Bangladesh. *Bangladesh Journal of Animal Science*, 38(1-2), 132-141.

APPENDIX

Status of household duck rearing system along with productive performance in selected area of Bangladesh (Companigonj, Noakhali).

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 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 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-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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BIOGRAPHY

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