



## Profitability analysis and gender division of labour in duck rearing: a case of Kishoreganj district in Bangladesh

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### Abstract

Like all other poultry species, rearing duck in Bangladesh has every potential to give maximum return with minimum investments. Keeping the view in mind, this study was endeavored to concentrate valuable information on profitability performance as well as gender division of labor in duck farming. The study was conducted in purposively selected five villages of Karimganj upazila under Kishoreganj district. A structured interview schedule was pre-tested, improvised and finally used to collect data from the selected 50 duck raising farms. The study found that total cost for 1000 ducks were estimated at Tk. 74455.57 per batch. Average gross return, average gross margin and average net returns for 1000 ducks was estimated at Tk. 151780, Tk. 83296.5 and Tk. 77324.47 per batch, respectively. Benefit cost ratio was estimated to be 2.03 for duck rearing. There existed gender division of labor in duck rearing, as, in duck rearing, women paid more attention in caring tasks such taking ducks out of the shade, feeding, cleaning shelter, breaking of snails, etc. The average female contribution was 51% of total duck rearing activities, but their participation in household decision making process was not satisfactory. In rearing duck, farmers had faced a few challenges like incidence of disease, lack of access to credit, low training facilities, high feed costs, lack of veterinary services and medicine, lower selling price and less market facilities. To overcome these difficulties of duck rearing and make the business more profitable, the recommendations actions can be undertaken by the respective authorities as early as possible.

**Key words:** Profitability analysis, duck farming, income generation, women's contribution

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### Introduction

Bangladesh is the biggest delta landscape in the world with a large human and natural resources. It is one of the most densely populated countries in the world and majority of the people are suffering from malnutrition, especially for the shortage of animal protein. In Bangladesh, the average per capita availability of meat is 19.0 gm/day against the per capita requirement of 120 gm/day (HIES, 2010). Poultry production is an

efficient way to bridge the gap of said protein requirement in a faster way than by other sources of animal protein. In Bangladesh, about 25% people are directly engaged in livestock sector of which 50% are partly associated in livestock production and about 36% of the total animal protein comes from the livestock products in everyday life (DLS, 2014). The contribution of livestock sub-sector to the GDP is

1.73% (BER, 2015). Duck is one of the important among livestock sub-sectors that committed to supply cheap sources of good quality nutritious animal protein to the nation. It is reported that about 86% of poultry meat and 76% of eggs come from rural scavenging poultry (Yamamoto *et al.*, 2003). Like all other poultry species, rearing ducks in Bangladesh has every potential to give maximum return with minimum investments. With few exceptions, ducks in Bangladesh are traditionally raised in scavenging system by the smallholders in coastal and low-lying areas (Rahman *et al.*, 2009). Duck rearing provides subsidiary income to landless, marginal and small farmers (Islam *et al.*, 2003). Ducks, being an important poultry species, can contribute efficiently in increasing egg and meat production than chicken in the low lying areas. Consumption of duck meat and eggs in the country is estimated about 30% of total poultry meat and egg consumption (Islam *et al.*, 2003).

Duck is an important component of farming system and plays a significant role to 80% rural people of Bangladesh. It provides cash income and creates employment opportunity for rural people, particularly for small and landless farmers. Ducks can be raised cheaper than broiler, if market is properly organized (Singh, 2001). Unlike chicken they are resistant to many diseases; therefore, they offer great opportunity to provide low cost eggs and meat (Saleque, 2007). Duck production is diversified into several raising systems based on economic criteria like industrial integration, medium to large and small commercial, and mixed farming systems (integration of rice-ducks, ducks-fish or rice-fish-ducks) or spatial criteria, like scavenging, semi-confined and confined systems (Edan *et al.*, 2006). In Bangladesh ducks are generally reared under scavenging system predominantly in the regions which are prone to seasonal inundation. The vast areas of *haors*, canals, *bills*, ponds and low-lying water reservoirs considered to be the breeding grounds for a number of biotic structures to support the duck rearing in Bangladesh.

A vast majority of the total female population of Bangladesh lives in rural areas and most of them play a major role in the areas of management of crops, livestock, fisheries, post harvest operations, homestead forestry and gardening, non-farm activities and family household organization (Paris *et al.*, 2004). In Bangladesh, rural women feel more comfortable to participate in home-based income activities (Hossain and Bayes, 2009). Empirical evidence indicates that there are significant gender differences in all spares and family lives in rural Bangladesh. The rural social structure plagued with many problems such as illiteracy, unemployment, malnutrition and poverty. Even there is the traditional system and institution that place them in unequal and disadvantages position (Ali, 2012). Housewives, daughter, son and other persons in a family are involved in looking after ducks and 100% housewives are involved in rearing ducks giving more time than other members of the family (Rahman, 2009). Estimates noted that about 70% people in Bangladesh are suffering from malnutrition and 81% families don't get calories according to their needs (Akhter, 2008). Duck is a great source of protein in the form of egg and meat. The increasing ratio of egg, meat and milk production is considered as a good sign and a step for the improvement of nutritional status in rural Bangladesh.

Keeping these views in mind, this study was endeavored to concentrate valuable information on profitability performance as well as gender division of labor in duck farming. The objective of this study was to identify the socioeconomic characteristics of duck farmers, estimate the profitability of duck rearing, assess the gender division of labor in duck rearing, identify problems faced by duck raisers and suggest some recommendations for its improvement.

## **Materials and Methods**

Based on the objectives under this study, five villages in Karimganj upazila under Kishoreganj district were selected. These villages were primarily selected as a suitable area for the study because different categories

of duck raising farms were existed in there and no socioeconomic study of this type was done previously here. The selection of the study areas were made by the suggestions of members of Union Parishad, NGO workers and upazila level officials who used to deal with flood affected people. An up to date list of all the duck farming households was prepared with the help of Upazila Livestock Officer (ULO) and members of Union Parishad. A total of 50 duck farming household of the selected five villages constituted the population of the study. Both qualitative and quantitative data collection procedures were used in the study. Data were collected through the pre-tested interview schedule by face-to-face interview procedure during the period for three months from February to March, 2016. Secondary data were collected from the related reports, DLS, BBS, internet searching and published and unpublished journals.

Socioeconomic data were analyzed using various descriptive statistics like average, percentage and ratios and presented through tabular form. Profitability of duck farming was measured in terms of gross return, gross margin, net return and benefit cost ratio (undiscounted). The following formulas were used to calculate gross return, gross margin, net return and benefit cost ratio (undiscounted).

- Gross return,  $GR = P \times Q$ ; P = Sale price of duck (Tk.), and Q = Quantity of duck (Tk.).
- Gross margin,  $GM = TR - VC$ ; TR = Total Return, and VC = Variable Cost.
- Net return,  $NR = GR - GC$ ; GR = Gross return, and GC = Gross cost.
- $GC = TFC + TVC$ ; TFC = Total fixed cost and TVC = Total variable cost.
- Benefit cost ratio,  $BCR = \text{Gross benefit} / \text{Gross cost}$ .

Gender division of labor of the study households presented mostly in tabular form. These forms are simple in calculation, widely used and easy to understand. Descriptive statistics like average, percentage and ratios were calculated to examine the

gender division of labor of duck farmers for making rank order, Problem Confrontation Index (PCI) was computed by using the following formula:

$$PCI = Ph \times 3 + Pm \times 2 + Pl \times 1 + Pn \times 0$$

Where,

Ph = Total number of farmers expressed problem as 'high';

Pm = Total number of farmers expressed problem as 'medium';

Pl = Total number of farmers expressed problem as 'low'; and

Pn = Total number of farmers expressed problem as 'not at all'.

Thus PCI of any problem could range from 0 to 150, 0 indicating 'no' problem confrontation and 150 indicating 'high' problem confrontation.

## Results and Discussion

### *Socioeconomic Characteristics of Duck Farmers*

Maximum farmers were found to be middle aged in the study area. Average age of selected farmers was observed to be 36 years. Average family size was 5.8 which appeared larger than the national average family size (i.e., 4.4) (BBS, 2011). Most of the duck farmers completed their secondary education level which was 44% of the total respondents. Maximum duck farmers were completed their primary and secondary education level and 94% farmers were literate. Table 1 shows that the literacy rate was higher than the national context where the recent statistics of literacy rate is claimed to be 55.9%. 42% farmers have taken duck farming as their main occupation. There were no large farmers in the study area and maximum farmers were medium (56%). 44% farmers reared duck from the numbers 2001 to 3000. Highest proportion of (62.8%) duck farmers had short-term training experiences. Highest proportion of (48%) duck farmers had an experience of 11 to 20 years. Highest proportion of (34.3 %) received credit from BRAC, while 11.4% from Bank and 20% from ASA and other 22.9% got credit from relatives (Table 1).

**Table 1.** Socioeconomic characteristics of duck raisers (n = 50)

Characteristics	Category	Percentage (%)
Age structure	15-35	34.0
	35-55	56.0
Family size	Below 15	18.5
	15-35	27.4
	35-55	39.0
Education level	Primary (class 1 to class 5)	28.0
	Secondary (class 6 to class 10)	44.0
	Higher Secondary (class 11 to class 12)	18.0
Occupational status	Duck farming	42.0
	Agriculture	18.0
	Petty business	16.0
Farm size	Small ( $\geq 1$ hectare)	44.0
	Medium (1.1-3 hectare)	56.0
Farm sizes based on number of duck rearing	1001-2000	30.0
	2001-3000	44.0
Training experience	Short term (up to 30 days)	62.8
	Midterm (up to 60 days)	25.6
Experiences of the respondents	(11-20) years	46.0
	(21-30) years	34.0
Sources of credit	BRAC	34.3
	ASA	20.0
	Relatives	22.9

Source: Field survey, 2016

### **Profitability Analysis of Duck Rearing**

#### **Estimation of total cost**

From Table 2 it was seen that Total cost of rearing for 1000 ducklings was estimated at Tk. 74455.57 and based on it, average variable and fixed cost was estimated at Tk. 68483.54 and Tk. 5972.03, respectively. The duck raisers of the study area mainly collected day-old-ducklings from hatcheries and familiar local agents and average cost of day-old-chick for 1000 birds was Tk. 32360 (43.5% of total cost). The average feed cost for 1000 birds was estimated at Tk. 28474.1 (38.2% of the total cost). Labor cost for 1000 ducks were estimated at Tk. 1845.5 (2.5% of total

cost). Average veterinary and medicine cost for 1000 ducks was Tk. 4339.6 (5.8% of total cost). Average cost of electricity charges was Tk. 402.81 (0.52% of total costs). Average transportation cost for 1000 ducks was Tk. 1061.56 (1.43% of total cost).

**Table 2.** Estimation of total cost in duck rearing

Particulars	Costs (Tk.)	Percentage (%)
<b>Variable cost</b>		
i. Duckling cost	32360.0	43.5
ii. Feed cost	28474.1	38.2
iii. Labor cost	1845.5	2.5
iv. Veterinary cost	4339.6	5.8
v. Electricity cost	402.8	0.5
vi. Transportation cost	1061.6	1.4
<b>A. Total variable cost</b>	<b>68483.5</b>	<b>91.9</b>
<b>Fixed cost</b>		
vii. Depreciation of housing cost	607.2	0.8
viii. Depreciation of tools and equipment cost	188.3	0.3
ix. Family labor cost	4148.88	5.6
x. Interest on operating capital	1027.65	1.4
<b>B. Total fixed cost</b>	<b>5972.03</b>	<b>8.1</b>
<b>Total cost (A+B)</b>	<b>74455.57</b>	<b>100.0</b>

Source: Author's estimation, 2016

Fixed cost included depreciation on housing cost, depreciation on tools and equipment cost, interest on operating capital and family labor cost. Average housing cost for 1000 ducks was Tk. 607.2 (0.8% of total cost). Average tools and equipments cost for 1000 ducks was Tk. 188.3 (0.3% of total cost). Average family labor cost for 1000 ducks was Tk. 4148.88 (5.6% of total cost). Interest on operating capital for 1000 ducks was Tk. 1027.65 (1.4% of the total cost) which was shown in Table 2.

#### **Estimation of Return**

Gross return was determined by adding income earned from sale of ducks. Average gross returns for 1000 ducks were Tk. 151780. Gross margin was calculated by deducting total variable costs from gross return on account of the enterprise. Average gross margins for 1000 ducks were at Tk. 83296.5. Average net returns

were estimated at Tk. 77324.47 which indicates that duck rearing is profitable business for the farmers. Benefit-cost ratio of duck farming was 2.03 implying

Tk. 2.03 would be earned by investing every Tk. 1.00 for duck rearing. So the duck rearing is profitable for farmers (Table 3).

**Table 3.** Gross margin and gross return for farm for 1000 ducks

Particulars	A. Gross return	B. Total variable cost	C. Total fixed cost	D. Total cost (B+C)	Gross margin (A-B)	Net return (A-D)	BCR (undiscounted) (A/D)
<b>Value (Tk.)</b>	151780	68483.5	5972.03	74455.53	83296.5	77324.47	2.03

Source: Field survey, 2016

**Gender Division of Labor in Duck Rearing**

Male family members always had domination in field work (i.e., watching in the field, collection of snails, buying food and collect fodder, etc.). In addition to household chores, women appeared to contribute a large share of work in duck rearing. As women have very limited access to market and field level activities, homestead activities related to duck rearing were mostly performed by them. On the total 1614 worked hours in one rearing period, male member done 788 hours (49%) and female done 826 hours (51%) of the total worked hours (Table 4). A discussion of the gender division of labour cannot be completed without a consideration of the extent to which women have

participated to household decision making process. Though, women contribute a significant amount of time to duck rearing, they have limited rights to the decision making process.

It is evident from Table 4 that, the participation index for decision making process is not so high for the duck rearing women. In buying and selling of real estate and buying daily necessities participation index for women was only 10% and 14%, respectively. Women’s participation rate in family planning is 81% but in case of duck rearing in the study area, the participation index was only 27%.

**Table 4.** Gendered division of labor in duck rearing

Activities	Division of labour (work hours)			Activities	Division of labour (work hours)		
	Total	Male	Female		Total	Male	Female
Buying ducklings from hatcheries	5	5	0	Taking ducks in and out of the shed	90	9	81
Shelter repairing and maintenance	2	1	1	Cleaning of shelter	90	5	85
Marking ducks for identification	5	2	3	Breaking of snails	270	54	216
Transportation and selling of ducks	26	15	11	Feeding	90	9	81
Vaccine injection	26	11	15	Give water and saline to ducklings	90	14	76
Weekly inspection	39	25	14	Counting the ducks after grazing	90	9	81
Buying food and collect fodder	90	9	81	Watching in the field	720	562	158
Collection of snails	65	65	0	Total	1614	788 (49%)	826 (51%)

Source: Authors’ calculation, 2016

Participation index for, marriage of sons and daughters, education of sons and daughters, borrowing of money,

joining social ceremonies or visiting relatives, participating NGOs were 30%, 31%, 32%, 34% and 36 %, respectively (Table 5). These findings are more than

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enough to conclude that women were actively involved in duck rearing activities in the study area but their

participation in household decision making process was very low.

**Table 5.** Participation index in household decision making process for women

Decision making process	Degree of participation (No. of responses)			Participation index (%)
	Wife	Husband	Both	
Buying and selling of real estate	4	44	2	10
Buying daily necessities	4	40	6	14
Family planning	3	26	21	27
Marriage of son and daughters	5	25	20	30
Education of sons and daughters	8	27	15	31
Borrowing of money	6	24	20	32
Joining social ceremonies or visiting relatives	10	26	14	34
To give a vote	27	9	14	68
Participating NGOs	12	26	12	36

Source: Field survey, 2016.

**Table 6.** Ranking of problems encountered by duck raisers

Problems	Extent of problem confrontation				PCI	Rank order
	High (3)	Medium (2)	Low (1)	Not at all (0)		
Incidence of disease	46	2	0	2	142	1
Lack of access to credit	41	3	3	3	132	2
Lower training facilities	29	5	11	5	108	4
High feed costs	25	10	12	3	107	5
Lack of veterinary services	35	10	2	3	127	3
Non availability of medicine	22	15	8	5	104	6
Lower selling price	13	8	19	10	74	8
Less market facilities	17	10	10	15	81	7

Source: Authors' estimation based on field survey, 2016; Note: PCI = Problem confrontation index (Possible score range 0 to 150).

***Problems Encountered by the Duck Raisers and Suggestions***

It was evident from Table 6 that in the study area, farmers rearing Duck was facing a few challenges like incidence of disease (i.e., lameness, feather-pecking, bird flu, etc.), lack of access to credit, low training facilities, high feed costs, lack of veterinary services, non-availability of medicine, lower selling price, less market facilities, etc. In order to ascertain the extent of severity of problem confronted by the raisers in rearing ducks, problem confrontation index was computed. The computed PCI of the 8 problems ranged from 74 to

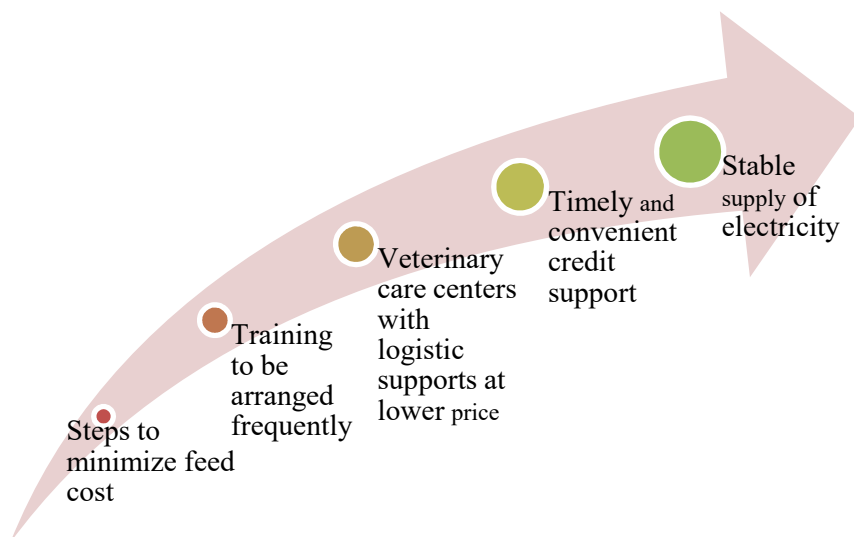
142 (against a possible range from 0 to 150) and arranged in rank order according to their problem indices which appears in Table 6. Majority of duck raisers point out that incidence of disease was the main problem in rearing duck. It was the main problem confronted by the duck raisers. Out of 50 duck raisers, 46 were confronted this problem at high extent; hence was considered as the 1<sup>st</sup> ranked problem. To move on, a good number of duck raisers pointed out that, lack of access to credit was an important problem in duck rearing. Then again, lack of access to veterinary services was a problem faced by the duck raisers. As

the study area is situated near to the *haor* areas, veterinary services are not readily available in there.

Lower training facilities were mentioned as another problem faced by the duck farmers in the study area. Adequate training facilities enhance knowledge and modern information which reduce the ability of farmers to increase production. High feed costs were mentioned as another problem faced by the duck farmers with PCI of 107. Having the good feed with a reasonable price at a right time is essential for the better production of ducks in study area. Availability of medicine is crucial to prevent certain diseases. In the study area, medicine was not so available; so people felt difficulty in raising ducks. The computed value of PCI for non availability of medicine was 104, which was considered as the 6<sup>th</sup> ranked problem. Less market facilities and lower selling price were also the problems faced by the duck farmers (Table 6).

## Conclusion and Recommendations

Based on the findings of this study, it is fair enough to note that duck rearing is a profitable business in the study area. Promotion of this enterprise would largely enhance the process of employment generation, income potentiality and poverty alleviation which are now considered as the major concern in the development planning process of Bangladesh. The result of the present study clearly indicates that commercial duck farms are profitable business. The profit could possibly be increased, if feed supply is ensured at reasonable prices. Necessary steps should be taken by the government to reduce the price of ducklings. Moreover, adequate financial support to establish more hatcheries throughout the country should be provided. For efficient management of poultry farming, supply of electricity should be sure.



**Figure 1.** Suggested actions to lessen difficulties in duck rearing

Government and mass media should take initiatives to reduce information gap, prevent rumor like bird flu and other poultry diseases. Women are actively involved in duck rearing activities. At the duck rearing activities, the contribution of labor by women will be beneficial, if and only if, the participation of women in to the

intra-household decision making process is improved. The deprivation of women is largely due to socio-cultural settings of the farming society in the study area and needs to be altered in favor of women in an emergency basis. Although a number of problems and difficulties were encountered by the ducks farmers, it is

encouraging that a good number of duck farms had already been established and continuing their enterprise there. To overcome the difficulties of duck rearing and make the business more profitable in the study area and also all over the country, the actions recommendations can be undertaken by the respective authorities as early as possible.

### References

- Akhter S (2008). Broiler Farming under Aftab Bahamukhi Farm Limited Supervision and Farmers Own Management: a Comparative Efficiency Analysis. An Unpublished M.S. Thesis, Department of Agricultural Economics, Bangladesh Agricultural University, Mymensingh.
- Ali R (2012). Changing Expectations of Gender Roles in Bangladesh: The Case of Female Field Staff of BRAC. Research Monograph Series No. 52.
- BBS (2011). Bangladesh Bureau of Statistics, Statistics Division, Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka.
- BER (2015). Bangladesh Economic Review, Economic Advisers Wing, Finance Division, Ministry of Finance, Government of Peoples Republic of Bangladesh, Dhaka.
- DLS (2014). A Brief of Organizational Structure and other Activities. DLS Report, Department of Livestock Services, Dhaka, Bangladesh.
- Edan M, Luthi N, Gautier P, Guerne-Bleich E (2006). Free Ranging Ducks and Risks in Avian Flu disease in Vietnam.
- HIES (2010). Preliminary Report on Household Income and Expenditure Survey, Bureau of Statistics Division, Ministry of planning, Government of the Peoples Republic of Bangladesh, Dhaka.
- Hossain M, Bayes A (2009). Rural Economy and Livelihoods: Insights from Bangladesh. (Dhaka: A H Development Publishing House).
- Islam MN, Huque QME, Salahuddin M, Sarker MSK (2003). Potentiality of Native Genotypes of Ducks. Proceedings of the 3<sup>rd</sup> International Poultry Show and Seminar, WPSA-BB, 28 Feb-02 March 2003, Dhaka, Bangladesh, 3:25-29.
- Paris TR, Chowdhury A, Bose ML (2004). Changing Women's Roles in Homestead Management: Mainstreaming Women in Rural Development, Centre for Policy Dialogue (CPD), Dhaka.
- Rahman MM (2009). Development of Feeding Strategy for Ducks Raised by Small Farmers in Coastal Areas of Bangladesh. PhD. Thesis, Department of Animal Nutrition, Bangladesh Agricultural University, Mymensingh.
- Rahman MM, Khan MJ, Chowdhury SD, Akbar MA (2009). Duck Rearing System in Southern Coastal Districts of Bangladesh. *Bangladesh Journal of Animal Science* 38 (1&2):132-141.
- Saleque MA (2007). Poultry Industry in Bangladesh: Current Status and its Challenges and Opportunity in the Emerging Market Environment. Poultry Business Directory, Dhaka.
- Singh RA (2001). Poultry Production, 3rd Edition, Kalyani Publishers, New Delhi-Ludhiana, India. pp. 345.
- World Bank(2016). <http://data.worldbank.org/indicator/SP.RUR.TOTL.ZS>
- Yamamoto T, Huque QME, Paul DC, Sarker NR, Salahuddin M (2003). BLRI, Poultry Production Model: A strategy for Rural Development in Bangladesh. Proceedings of 3<sup>rd</sup> International Poultry Show and Seminar, Bangladesh China Friendship Conference Centre, Dhaka, Bangladesh, pp. 251-258.