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AN ECONOMIC STUDY ON PRODUCTION AND MARKETING OF DUCKS IN HAOR AREAS OF NETROKONA DISTRICT

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ABSTRACT

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Livestock subsector of poultry in Bangladesh is playing important role to its economy in light of growing small business, sources of protein supply, and providing a livelihood for millions of people. The study was designed to investigate the profitability of duck producing farms and marketing system of duck enterprise in haor areas of Netrokona district. In total, 50 farmers were selected. Farmers were divided into three categories (small, medium, large). The study shows that the average gross return from duck amounted to Tk. 47023 for small farms, medium farms gross return was Tk. 57580.82 and for large farms it was Tk. 57013.83. All farms average gross return was Tk. 53872.55. Annual net return for small farms from duck amounted to Tk. 19603, for the medium farm it was Tk. 23275 and Tk. 24275.16 for the large farms. Undiscounted BCR for small, medium and large farmers were 1.71, 1.68 and 1.74 respectively. The study also shows that, the marketing costs of paikers, wholesalers and retailers were Tk. 1920, Tk. 3019.41 and Tk. 2859.4 respectively. The corresponding net marketing margins were estimated at Tk. 833.33, Tk. 1173.66 and Tk. 938.6 per 100 ducks. This study identified some of the problems and constraints associated with production and marketing of duck which were- scarcity of feed, higher price of feed, higher transportation cost, lack of capital, lower price of ducks. Based on findings, recommendations were made for the improvement of this prominent duck farming sector.

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INTRODUCTION

Bangladesh is agriculture based country with 14,769.55 sq. kilometers area and blessed with 160 million people with a variety of agricultural resources (BBS, 2015). Agriculture contributes about 14.74 percent in Gross Domestic Product (GDP) (BER, 2017). About 41 percent of total human power of Bangladesh relates in agriculture (BER, 2017). Livestock sub-sector is vital for the development of agro-based Bangladesh and the contribution of this sector in GDP is 1.6% (BER, 2017). This subsector provides us animal protein for human nutrition, cash income to the family, fuel for rural households, organic manure for crop production, fish feed and provides opportunities for self employment. Poultry meat contributes approximately 38 percent of total animal protein supply in the country (Ahmed and Islam, 1990). Poultry meat and eggs available in Bangladesh are mostly originated from locally grown backyard poultry and also from small and large scale poultry enterprises. Meeting the domestic demand for meat and eggs through importation is very rare and sporadic (Anas, 2015). Poultry meat mainly from duck is superior to other meats available for human consumption Duck meat and egg offers considerable potential for meeting human needs for dietary animal supply. There are approximately 42.124 million duck populations in Bangladesh (BBS, 2014) of which most of the ducks are reared in backyard system. It serves dual purpose-egg and meat, which occupies second place next to chicken in producing poultry meat and eggs (BBS, 2014). Similarly, in the report of Food and Agriculture Organization (FAO), it is evident that the position of Bangladesh with respect to duck meat and egg production is 11th and 4th, respectively among the Asian countries (Pingel, 2011).

The term “haor” denotes the bowl-shaped large tectonic depression that receives surface runoff water by rivers and canals, and consequently, becomes very extensive water body in the monsoon and dries up mostly in the post-monsoon periods (Rana et al., 2010). Huque and Sultana (2002) reported that natural water areas in different districts of Bangladesh vary from 151 to 12731 hectares. The haor had a historical duck rearing culture in household level (backyard). Netrokona is an important duck growing area in Bangladesh, consisting of 924 hectares of natural water area where waters stand throughout the year and about 60% of total land goes under water for six months (Huque and Sultana, 2002).

Duck production in the haor areas of Bangladesh provides self-employment for landless and small farmers. Duck keeping is one of the possible means of breaking out poverty trap of resource-poor small holder families in low income countries (Pym et al., 2002). Ducks are considered to be the most important asset and source of income for ultra poor rural women (Jabber, 2004). It is easier for the haor people to rear duck than the backyard poultry farming and cattle rearing due to the ecological condition of the haor areas. Duck feeds and water are available in the haor areas. No systematic study has yet been done to assess the potentiality, profitability and marketing aspects of duck rearing system in the haor areas of Bangladesh. The present study generated information on socio-economic profiles of the duck owners, assessed profitability of duck rearing practices, provided information on marketing aspects and identified the problems on duck farming in the haor areas of Bangladesh. So, the government, policy makers, planners and other concerned agencies will get help to formulate development policies regarding more effective duck farming in the country by using the information of this study.

MATERIAL AND METHODS

Selection of the study area

The areas were selected from Atpara upazilla under Netrokona district. Primary data were collected from farmers of Robiargati, Ikarathia, Kailong and Shitarampur villages of Atpara upazilla.. For the marketing information, three market places namely Teligati bazaar, Ovoipasha and Atpara market were selected for the present study.

Selection of the samples

In the present study farmers were classified into three categories according to their farm size. The number of duck was below 250 categorized as small farm, 250-500 numbers of ducks in a farm classified as medium farm and above 500 ducks categorized as large farms. In the study area there were 24 small farms, 20 medium farms and 6 large farms as the given category. A stratified random sampling technique was followed in this study where 24 farmers were categorized as small farmer, 20 as medium farmers and 6 farmers were large farmers. In total 50 farms were selected for collecting necessary information of the study.

Collection of data

Data were collected by the researcher herself in the month of March to June 2015 covering the year 2014-15. A set of final survey schedule was developed with necessary corrections and modifications. The data were collected from the selected duck farmers by conducting direct interviews through personal visit to the houses of the farmers. Before beginning of the interview a brief introduction about the purpose of the study was given to the respondents. Then the questions were asked in easy and understandable language and the information was recorded on the survey schedule.

Analytical technique

Tabular techniques were applied with the help of some statistical measures like the sum average, percentage, etc., to show the comparative performance of duck farming. Profitability analysis was done on the basis of variable cost, fixed cost, return etc. By using arithmetic means and percentages, different costs, gross margins, net profit and benefit cost ratio were calculated in a tabular form.

Gross return

Gross return is the money value of total gross output. In the present study, the total value of consumed and sold out ducks were taken into account as benefits of the farms at the existing market price of duck. In the present study, gross return was calculated as follow:

$$\text{Gross return, GR} = \sum QP$$

Q = Total number of ducks produced per farm a year and P = Per unit price (Tk.) of duck

Gross margin

Gross margin was calculated by subtracting the total variable costs from the gross return, showed in the following equation.

$$\text{GM} = \text{GR} - \text{TVC}$$

Where,

GM = Gross margin; GR = Gross return; and TVC = Total variable cost

Net return

Here, the following profit equation was developed to assess the profitability of the duck farms and this model was also used by Mahmud (1998) in his study.

$$\pi = P_d Q - \sum X_i P_{X_i} - \sum \text{TFC}$$

Where, π = Profit per duck farm (Tk.)

P_d = Per unit price (Tk.) of duck

Q = Total number of ducks produced per farm a year

P_{X_i} = Per unit price of ith (variables) inputs

X_i = Quantity of the inputs (i = 1, 2, ... n)

TFC = Total fixed costs

Benefit cost ratio (BCR)

The benefit-cost ratio (BCR) is a relative measure which is used to compare benefit per unit of cost. BCR was estimated as a ratio of gross returns to total costs. The formula of calculating BCR (undiscounted) is shown as below:

Benefit cost ratio, (BCR) = Gross return/ Total cost.

RESULTS AND DISCUSSION

SOCIOECONOMIC CHARACTERISTICS OF THE SAMPLE FARMERS

Family size and occupation of sample farmers

Family size was denoted by classifying the families into three groups: small (0-5 members), medium (6-8 members), and large families consisting of more than 8 members. Here, 32 percent families of duck farmers are small, 48 percent families are medium and rest 20 percent are large families. The work in which a man engaged more or less throughout the year is known as the occupation of that person. Duck rearing is the main occupation of the duck farmers that is 40% and the rest of duck farmers reported to have agriculture, fishing, service, other business as their main occupation.

Educational status

To examine the educational status of the duck farmers, they were classified into four categories. i.e. (i) Illiterate, (ii) Primary level, (iii) Secondary level and (iv) Above secondary level (Mahmud, 1998). It was observed that 34 percent duck farmers were illiterate, 42 percent had primary education, 16 percent had secondary education and only 8 percent got above secondary level education and small farmers were more illiterate compare to medium and large farmers in the study area.

COSTS AND RETURNS DUCK PRODUCTION

Estimation of variable cost

Duckling Cost

Duckling cost was a crucial cost item for duck rearing. The farmers of the study area mainly collected ducklings from hatcheries and familiar local agents. All farms average duckling cost was Tk. 7136.65 comprising 24.86 percent of variable cost (Table 1). Small farms average cost of ducklings was Tk. 6553. This cost covered 26.44 percent of total costs. Medium farms average duckling cost was Tk. 7351.94 comprising 23.48 percent of total variable cost and for the large farms it was Tk. 7505 which is 25.01 percent of total variable cost. Duckling cost is less for small farms because of their financial condition they are not able to buy better and quality duckling in compared to medium and large farm.

Feed cost

The largest item of variable cost in duck farms is feed. In this study, the average feed cost for small farms was Tk. 10587 while for medium farms it was Tk. 11025.24. For large farms it was Tk. 11666.66. All farms average feed cost was Tk. 11092.97 which is 38.65 percent of total variable cost (Table 1). Here feed cost for large farms is higher because they purchased quality feed and their volume of production is high compared to small and medium farm so their feed cost was high.

Labour cost

Labour cost was another crucial cost item in duck production. Labour was mainly used for feeding, cleaning of house, and watching ducks. The cost of labour was calculated on the basis of the existing wage rate which was on an average Tk. 150 per man day. Average cost of labour per small farm was 12.50%, medium farms 30.59% and 26.38% for large farms.

Veterinary cost

Vaccine and medicine were the main components of veterinary cost. Vaccine and medicine are essential for raising duck and also for preventing of diseases and for rapid growth of duck. For all farms it was 5.49 percent of the total variable costs (Table 1).

Electricity cost

Electricity required in duck farm for first two months of ducklings for maintaining hotness in duck house. The average electricity cost was estimated for small farm Tk. 1165, Tk. 670.39 for medium farm and Tk. 625 for large farms (Table 1).

Table 1. Average variable cost of producing duck for small, medium and large farmers (Tk. /100 ducks)

Items	Small farm		Medium farm		Large farm		All farms	
	Cost (Tk.)	%	Cos(Tk.)	%	Cost (Tk.)	%	Cost (Tk.)	%
Duckling cost	6553	26.44	7351.94	23.48	7505	25.01	7136.65	24.86
Feed cost	10587	42.71	11025.24	35.22	11666.66	38.88	11092.97	38.65
Labour cost	3100	12.50	9575.73	30.59	7916.67	26.38	6864.13	23.92
Veterinary cost	1767	7.13	1571.36	5.02	1388.84	4.63	1575.73	5.49
Electricity cost	1165	4.70	670.39	2.14	625	2.08	820.13	2.86
Transportation cost	1615	6.52	1109.71	3.54	902.83	3.01	1209.18	4.21
Total	24787	100	31304.37	100	30005	100	28698.79	100

Source: Field Survey, 2015.

Table 2. Average fixed cost of duck farms (small, medium and large farms) (Tk. /100 ducks)

Items	Small farm (Tk.)	Medium farm (Tk.)	Large farm (Tk.)	All farms (Tk.)
Interest on operating capital	1115.50 (91.04)	1446.12 (90)	1386.50 (90.62)	1316.04 (90.52)
Housing cost	1517.5 (8.96)	1554.61 (10)	1347.17 (9.38)	1473.09 (9.48)
Total	2633 (100)	3000.73 (100)	2733.67 (100)	2789.13 (100)

Source: Field Survey, 2015.

Table 3. Profitability of duck rearing in Netrokona haor areas (Tk. /100 ducks)

Items	Small farm	Medium farm	Large farm	All farms
A.TotalVariable Cost	24787	31304.37	30005	28698.79
B.Total Fixed Cost	2633	3000.73	2733.67	2789.13
C.Gross cost (A+B)	27420	34305.10	32738.67	31487.92
D.Gross return	47023	57580.82	57013.83	53872.55
Gross Margin (D-A)	22236	26276.45	27008.83	25173.76
Net return (D-C)	19603	23275	24275.16	22384.39
BCR (Undiscounted)	1.71	1.68	1.74	1.71

Source: Field Survey, 2015.

Table 4. Average marketing costs of different intermediaries involved in duck marketing (Tk. per 100 ducks).

Items of cost	Paiker	Wholesaler	Retailer
Feed	800 (41.66)	720 (23.85)	600 (20.98)
Labour	360 (18.75)	550.43 (18.23)	515.4 (18.04)
Cage	180 (9.38)	308.30 (10.22)	320 (11.19)
Transportation	350 (18.23)	950 (31.46)	920 (32.17)
Market toll	...	120.68 (3.99)	184 (6.44)
Personal expenses	150(7.81)	250 (8.28)	180 (6.29)
Others	80 (4.16)	120 (3.97)	140 (4.89)
Total	1920 (100)	3019.41 (100)	2859.4 (100)

Source: Field survey, 2015.

Table 5. Marketing margin of different intermediaries

Intermediaries	Purchase price (Tk./100 ducks)	Sale price (Tk./100 ducks)	Marketing margin (Tk./100 ducks)	Percentage of margin
Paikers	17945.60	20698.93	2753.33	25.63
Wholesalers	20698.93	24892	4193.07	39.03
Retailers	24892	28690	3798	35.34
Total			10744.4	100

Table 6. Problems and constraints faced by duck farmers

Constraints	Number of responding farmers (n=50)	Percent
Lack of capital	31	62
High price of duckling	39	78
Higher price of feed	43	86
Lower quality of duckling	24	48
Housing problem	30	60
Outbreak of disease	40	80
Inadequate veterinary services	33	66
Lack of marketing information	32	64
Lack of proper training facilities	20	40

Source: Field survey, 2015.

Transportation cost

Transportation cost of the small farm, medium farms and large farms cost were Tk. 1615, Tk. 1109.71 and Tk. 902.83 of total variable costs (Table 1).

Fixed cost

Fixed cost showed in the Table 2 included interests on capital and housing cost. These are described below

Interest on operating capital

Interest on operating capital was computed at the rate of 14.00 percent for a year. Interest on operating capital was computed by the following formula:

Interest on operating capital= $AI*i*t$

Where,

AI = Total investment/2;

i = Interest rate which was assumed at 14 percent; (Present interest rate of the study area)

t = length of the period of duck production (per farm).

In the study area farmers rear ducks for 4 months twice a year. Interest on operating capital for per duck farm was estimated at Tk. 1115.5 for small farms, Tk. 1446.12 for medium farms and Tk. 1386.5 for the large farms, respectively.

Housing cost

Housing cost for per duck farm were estimated at Tk. 1517.5 for small farms, Tk. 1554.61 for medium farms and Tk. 1347.17 for the large farms respectively.

Gross return

The small farms, medium farms and large farms all were earned Tk. 47023, Tk. 57580.82, Tk. 57013.83 per 100 ducks, respectively. All farm's average earning was Tk. 53872.55 per 100 ducks. It should be noted here that farmers in the study area bought day-old-chick and raise for four months and then they sold it (Table 3).

Gross margin

Gross margin is a paramount to consider the economic value when considering a relatively new breed on a farm as it will have ripple effects on the business as a whole. From the Table 3, Average gross margin for all farms were at Tk. 25173.76 per 100 ducks.

Net returns

Net return on total cost was derived by deducting all the costs from the gross return. Table 3 showed that net return of small farm was Tk. 19603, for the medium farm it was Tk. 23275 and Tk. 24275.16 for the large farms.

Benefit cost ratio (undiscounted)

Benefit cost ratio implies return per taka invested. It helps to analyze the financial efficiency of the farm. The benefit cost ratio of small farm was 1.71, medium farms benefit cost ratio was 1.68 and 1.74 for large farms. All farms benefit cost ratio was 1.71 implies farms are efficient in term of financial benefit (Table 3).

MARKETING SYSTEM OF DUCK REARING

Marketing channels of duck

- I. Farmer → Paiker → Wholesaler → Retailer → Consumer
- II. Farmer → Wholesaler → Retailer → Consumer
- III. Farmer → Paiker → Consumer
- IV. Farmer → Wholesaler → Consumer
- V. Farmer → Retailer → Consumer
- VI. Farmer → Consumer

Among them iv, v, vi are more common and widely used marketing channels of duck in the study area.

Marketing cost

Marketing cost of paikers, wholesalers and retailers were Tk. 1920, Tk. 3019.41 and Tk. 2859.4, respectively (Table 4).

Marketing margin

According to Kohls and Uhl (1980) marketing margin is defined as the difference between what the consumers pay and what the producers receive. Marketing margin included marketing cost. Marketing margin of paikers, wholesalers and retailers were Tk. 2753.33, Tk. 4193.07 and Tk. 3798 respectively (Table 5). The marketing margin of wholesalers was the higher for big volume of buying and selling. Wholesalers margin was highest than those of paiker and retailers, because the wholesalers can buy duck from farmers at farm level or from paikers at low price and they sold their ducks to retailers and hotels by which they could secure more selling price. The marketing margin was lowest for paikers because of their temporary business, higher marketing cost for lower quantity of duck and charging minimum margin over the purchase price and marketing cost. The profit of farmers and traders depends on fixed product price, their marketing cost and margin. Among the market intermediaries, wholesalers marketing cost and margin were highest where it was lowest for paikers.

PROBLEM AND CONSTRAINTS OF DUCK REARING

According to the owners of duck farms, the following problems were identified in rearing duck in the study area which are mentioned in Table 6.

Lack of capital

Capital is the first and most important input to set up a duck farm. Without money the farm cannot be also enlarged. 62 % farmers of the study area complained that lack of sufficient capital is the major problem to run their business. For this reason farmers borrowed money from the Mahajan's with a high interest rate and later they faced the problem of repayment. Institutional credit is scarcely available in the study area.

High price of duckling and high price of feed

78 percent farm owners reported that high price of duckling is a major problem and 86 percent reported about the problem of high price of feed.

Lower quality of duckling

Farmer of the study area did not get the better quality duckling. 48 percent farmers told that they suffer the growth problem of duck because of lower quality of duckling.

Housing problem

Most of the farmers are unaware about proper housing facilities. For this reason, duck did not get proper aeration and it hampers its growth. It has been seen that 60 percent farmers told that they had lack of knowledge about proper housing management.

Outbreak of disease

The weather of Bangladesh is probably favorable media for the multiplication of various diseases producing organisms. In the study area about 80 percent farmers complained this problem.

Inadequate veterinary services

About 66 percent farmers told that this was a crucial problem. Some of the duck owners also reported that when the medicines were available in the market, they could not buy those due to the high price.

Lack of market information

Market information is crucial for any business. Lack of this hampers the profitability of the business. 64 percent of duck owners told about this problem.

Lack of training facilities

Knowledge on duck is crucial for the development of duck farming. Farmer's performance would be improved if they could be trained by livestock. 40 percent of farmers face this problem.

CONCLUSION AND RECOMMENDATIONS

In the agrarian and largely subsistence economy of Bangladesh, poultry plays a crucial role in supplying nutritious food, generation of income and employment opportunities. There are altogether 411 haors comprising an area of about 8000 km² dispersed in Bangladesh. The haor had a historical duck rearing culture in household level (backyard). Availability of natural feed, plenty marshy land enhances the duck rearing in this area and the duck rearing is a profit oriented business for the haor areas farmers. The market intermediaries of duck farm carried out different marketing functions such as buying and selling, pricing, transportation, sorting, grading, market information etc. Marketing cost and margin play an important role for the improvement of a marketing system in the developing country. The duck farm owner faced various production and marketing problems in the study area. If proper remedial measures could be taken, duck rearing could be a viable commercial enterprise which in turn would play a vital role to overcome the problems of low income, unemployment, under nutrition and unfavorable balance of payment situation of the country. To overcome the difficulties of duck production and make the business more profitable in the study area, the following recommendations can be made-

1. The profit could possibly be increased, if feed supply is ensured at reasonable prices.
2. The concerned livestock officials of upazila should take more effective steps so that haor areas people can have a clear idea about the livestock services.
3. Adequate financial support to establish more hatcheries throughout the country should be provided.
4. Different short term training programmes on the basic management principles of duck farms as well as some fundamental disease control measures should be arranged by upazila livestock assistant so that farm owners can know more about the duck farm management.
5. Credit facility should be provided to the duck farm owners through banks or financial institutions on easy terms and condition.
6. The price of duck should be fixed at a reasonable level, duck marketing system and transportation facilities should be improved by the concerned authorities.

CONFLICT OF INTEREST

There is no conflict of interest for this article.

REFERENCES

1. Ahmed S and Islam N, 1990. Backyard poultry development project in 100 villages. Proceedings of the 1st Conference of Bangladesh Animal Husbandry Association, Bangladesh Agricultural Research Council, Dhaka.
2. BBS (Bangladesh Bureau of Statistics), 2015. Statistical pocket book of Bangladesh, Statistics Division, Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka.
3. BBS (Bangladesh Bureau of Statistics), 2014. Statistical pocket book of Bangladesh, Statistics Division, Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka.
4. BER (Bangladesh Economic Review), 2017. Ministry of Finance, Government of the People's Republic of Bangladesh, Dhaka.
5. Anas AZM, 2015. Branded meat sector grows as middle class demand rises. Published in Financial Express on 1st February.
6. Pingel H, 2011. Waterfowl production for food security. Lohman Information, 46: 34-37.
7. Huque K S and Sultana N, 2002. Study on the existing duck production systems in Bangladesh, A report of Bangladesh Livestock Research Institute, Bangladesh.
8. Rana M P, Shohel M S I, Akter S and Alam M S, 2010. Haor based livelihood dependency of rural community: A study on hakaluki haor in Bangladesh. Proceeding of the Pakistan Academy of Sciences, 47: 1-10.
9. Jabber MA, 2004. Smallholder livestock for poverty alleviation: issues and prospects. Keynote paper presented at BARC, Dhaka.
10. Pym RAE, EB Lanada and EY Morbos, 2002. Case studies of family poultry development. 2nd INFPD-FAO, Electronic conference. May 13-July 5, 2002.
11. Mahmud M, 1998. An economic analysis of duck raising in some selected haor areas of Kishorganj District, MS Thesis, Dept. Agril. Econ. Bang. Agril. Univ. Mymensingh, Bangladesh.
12. Kohls R L and Uhl J N, 1980. Marketing of Agricultural Products, Prentice Hall of India Private Ltd, New Delhi.