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Impact of private broiler farming on rural employment and income generation in Kishoreganj district

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Abstract

The study attempts to identify the costs, returns, profitability, employment and income generated through the private poultry farming in Kishoreganj district. In total 150 broiler farms were randomly selected from Kishoreganj Sadar Upazila and Katiadi Upazila. The field level data were collected during November 2004 to January 2005 through direct interviews with broiler farmers. The study shown that the gross return per farm per year was Tk. 7,85,600, per batch per farm was Tk. 1,17,079 and per bird per batch was Tk. 76.12. Costs of feed, day-old-chicks, human labour and veterinary charges were the key inputs affecting the profitability of broiler farms. The summation of elasticity of different inputs for broiler farms was less than one, implying that the production function exhibited a decreasing returns to scale i.e., doubling the inputs would less than double the output. Most of the family labour came from female especially small farms (38 per cent) which mean that the private poultry farming creates the job opportunities for the farm families. It is also observed that the small, medium, large and all broiler farms could save annually a good portion of their income earned from the poultry farming venture.

Key words: Impact, Poultry, Enterprise

Introduction

Importance of broiler farming can be realized from two standpoints, such as economic point of view and nutritional point of view. Broiler farming in Bangladesh has considerable potentiality for providing employment opportunities especially for those who have limited land or are landless, unemployed youths and destitute women. Broiler farming requires small space and less capital. It gives maximum return with minimum expense and can produce meat in the least possible time. Recently many educated and less-educated people are trying to start broiler enterprise to take part in the supply of meat and earning cash income. In Bangladesh, about 39.7% children are underweight; about 46.8% of the mothers suffer from nutrition deficiency and about 46.2% of the children have stunted growth. About 49% of the children below the age of six suffer anemia (Bangladesh National Nutritional Survey, 2005). One important cause of the nutritional deficiency is the poor consumption of animal protein. Consumption of animal protein in Bangladesh is only 18.56 grams (BBS, 2001) per capita per day vis a vis the standard requirements of 34 grams as recommended by UNO (Esmat, 2007). In Bangladesh, half of the population is aged less than 15 years, specially this group of people need 70 grams to 100 grams of protein per person per day (Rahman, 1999).

Ahmed *et.al.* (1995) conducted an economic study on the performance of broilers round the year. They found that mortality of the broilers was the lowest in summer and the highest in rainy season. Profit per kg of broiler was the highest (Tk. 14.12) in summer and the lowest (Tk. 4.22) during rainy season. The highest feed cost (Tk. 57.80) was observed in rainy season compared to other two seasons and the lowest feed cost (Tk. 49.82) was observed in summer season but the costs of chicks, labour and miscellaneous items were the highest (27.68, 14.74 and 7.76 percent) in summer compared to other two seasons. Uddin (1999) conducted a study on economic analysis on broiler and layer production in some selected areas of Sadar Thana in Mymensingh district. The study revealed that on an average, the total costs per bird per day were Tk. 1.65 and 1.29 for small and large layer farms and Tk. 1.95 and Tk. 1.82 for small and large broiler farms, respectively. The gross returns and net

returns per bird per day stood at Tk. 2.33 and Tk. 0.68 for small layer farms and Tk. 2.15 and Tk. 0.86 for large layer farms and Tk. 2.14 and Tk. 0.19 for small broiler farms and Tk. 2.18 and Tk. 0.36 for large broiler farms, respectively. Chowdhury (2001) conducted a study on comparative economic analysis of broiler farming under Aftab Bahumukhi Farm Ltd. in Bajitpur of Kishoreganj district. He found that on an average the total costs per small, medium and large broiler farms per year were Tk. 413402, Tk. 605621 and Tk. 865528 respectively. The average gross returns per farm per year stood at Tk. 458874, Tk. 747055 and Tk. 1107024 for small, medium and large broiler farms respectively. The study revealed that these farms were highly profitable from the viewpoints of contract growers. All these studies in addition to being very partial in nature, addressed only the existing aspects in the organization and operation of the poultry farming and failed to answer as to how much of employment could be generated and how the poverty of resource poor farmers could be alleviated by practicing poultry enterprise of different categories of broiler farms. This study was undertaken to examine empirically the socio-economic characteristics of farm owners, costs, returns, and profitability and, the magnitude of employment and income generated through the private poultry farming.

Materials and Methods

Considering the concentration of private broiler farming, Kishoreganj district was purposively selected for this study. To achieve the objectives of the study a preliminary survey was conducted in different villages under Kishoreganj Sadar Upazila and Kotiadi Upazila. At first a list of 381 private poultry farmers was prepared with the help of the officials of two ULO. A total of 150 broiler farms covering 22 villages of Katiadi Upazila and 20 villages of sadar Upazila of Kishoreganj district were purposively selected. Simple random sampling was followed for drawing samples from each stratum of the sampling farm based on farm size. Out of the selected farms, 50 were small farms (raising upto 1000 birds), 50 medium farms (raising 1000 to 1500 birds) and 50 were large farms (raising more than 1500 birds). The present study covered a one year period from January to December 2004. Data were collected during November 2004 to January 2005 by a trained investigator by using a structured survey questionnaire.

Results and Discussion

Socio-economic characteristics of farm owners

Thirty eight per cent of the farm owners belonged to the age group of 30 to less than 40 years while only 1 per cent and 7 per cent of the farm owners belonged to the age group of less than 20 years and greater than 50 years. So, young people dominated the poultry farming.

The highest number of the poultry farmers (61 per cent) had secondary level of education followed by 13 per cent with higher secondary education another 13 per cent were illiterate. Only 7 per cent of the farmers had graduation and above level of education. Young educated and less educated people are more interested in broiler farming and take it as an alternative job and source of income.

Most of the small and large farm owners pursued only broiler farming as the major occupation than the medium farms. Medium farm owners were involved more in agriculture than the large and small farm owners. Sixty two per cent of the medium farm owners took broiler farming as subsidiary occupation whereby 46 per cent of large farm owners were involved in broiler farming as subsidiary occupation. Forty seven per cent of the all farm owners were involved in broiler farming as their main income source followed by agriculture (29 per cent).

There were mainly three motivating factors which encouraged the sample farmers to start broiler farming. In the case of all broiler farms 70 per cent, 49 per cent and 10 per cent farmers were motivated by apparent profitability of broiler farming, other farm owners and training program respectively. Among the farm categories majority of the small (70 per cent), medium (80 per cent) and large (60 per cent) farm owners were motivated due to apparent profitability.

The average size of the family consisted of 5.67 members of which 3.21 were male and 2.55 were female. The average family size was lower than the national average (6.0) and was the highest (6.04) in the case of the large broiler farms and the lowest (5.42) for the small broiler farms while for medium broiler farms, it was 5.82 (BBS, 2006). All the farm categories were characterized by dominance of male members in the family. Working members aged 15 to 55 constituted 95 per cent, 93 per cent and 91 per cent for small, medium and large broiler farms.

Cost of broiler production

The total costs per bird per batch were estimated at Tk. 76.50 for small farms, Tk. 75.52 for medium farms, Tk. 76.35 for large farms and Tk. 76.12 for all broiler farms. Variable costs per bird per batch were Tk. 63.74, Tk. 64.67, Tk. 64.82 and Tk. 64.41 for small, medium, large and all broiler farms respectively; while the fixed costs per bird per batch stood at Tk. 12.76, Tk. 10.85, Tk. 11.53 and Tk. 11.71 for small, medium, large and all broiler farms respectively (Table 1).

Feed cost was the most important component covering 53.54 per cent of the total costs for small farms, 54.64 per cent for medium farms, 54.71 per cent for large farms and 54.30 per cent for all broiler farms. The total feed cost per bird (35 days old) for all broiler farms was estimated at Tk. Tk. 41.35. Day-old-chick cost was another important cost item while, on an average, per bird buying cost was the same for all categories of the broiler farms which was Tk. 16.70. Day-old-chick cost covered 21.92 per cent of the total costs for all broiler farms. Veterinary cost per bird per batch was estimated at Tk. 3.55 for small farms, Tk. 4.43 for medium farms, Tk. 3.67 for large farms and Tk. 3.88 for all broiler farms. Veterinary cost covered 5.1 per cent of the total costs for all broiler farms. Hired labour cost accounted for 1.48 per cent of the total costs for small farms, 1.29 per cent for medium farms, 0.76 per cent for large farms and 1.18 per cent for all broiler farms. On an average, hired labour cost per bird was Tk. 0.86 for all broiler farms. Cleaning cost per bird per batch was estimated at Tk. 0.65 for all broiler farms. Cleaning costs accounted for about 1.1 per cent of the total costs for all broiler farms. Transportation costs per bird per batch amounted to Tk. 0.06 for all broilers farms. The per bird per batch electricity cost was calculated at Tk. 0.90 for all broiler farms and its share of the total cost was 1.18 per cent.

The housing cost covered 8.4 per cent of the total costs for all categories of the farms. It was found that the depreciation and interest cost shared the major portion of housing costs. The tools and equipment costs covered about 0.32 per cent of the total costs for all broiler farms. It is seen that variable costs per bird were Tk. 63.74, Tk. 64.67 and Tk. 64.82 for small, medium and large farms. A comparison of some variable cost items such as feeds, human labour, veterinary charges, transportation cost indicates the following: as the farm size increases human labour cost per bird tended to decrease. Human labour costs required per bird for small, medium and large farms were Tk. 0.99, Tk. 1.07 and Tk. 0.53. Transportation cost showed the same trend as well, but veterinary cost showed a positive change with the changes in farm size. Thus it is seen that veterinary costs per bird for small, medium and

large farms were Tk. 3.55, Tk.4.43 and Tk. 3.67. These are however, expected changes. Feed cost which is the most important cost for the bird did show hardly any change with the change in farm size because every bird used to have a fixed ration and it did not change with the change in farm size.

Table 1. Total cost of broiler production bird/batch for small farms (below 1000 birds), medium farms (1000 to 1500 birds), large farms (above 1500 birds) and all farms (average 1538 birds)

Cost bird / batch in Tk.

Particular	Small farm		Medium farm		Large farm		All farms	
	Cost	% of total	Cost	% of total	Cost	% of total	Cost	% of total
A. Variable Cost (a+b+c+d+e+f+g)	63.74	89.60	64.67	85.79	64.80-	85.18	64.41	84.86
a. Feed cost	41.27	53.54	41.13	54.64	41.66	54.71	41.35	54.30
b. Day-old chick	16.64.	21.60	16.54	21.97	16.92	22.19	16.70	21.92
c. Hired labour	0.99	1.48	1.07	1.29	0.53	0.76	0.86	1.18
d. Veterinary cost	3.55.	4.62	4.43	5.88	3.67	4.82	3.88	5.10
Medicine	2.27	2.95	2.98	3.96	2.36	3.09	2.54	3.33
Vaccine	1.28	1.67	1.45	1.92	1.31	1.72	1.35	1.77
e. Cleaning cost	0.26	1.03	0.63	0.86	1.06	1.41	0.65	1.10
f. Transportation	0.05	0.07	0.06	0.09	0.06	0.08	0.06	0.08
g. Electricity	0.98	1.27	0.81	1.08	0.92	1.21	0.90	1.18
B. Fixed Cost (i+j+k+l+m)	12.76	16.40	10.85	14.21	11.53	14.82	11.71	15.14
i. Family labour	2.97	3.65	2.15	2.66	1.59	1.76	2.24	2.69
j. Housing cost	6.70	8.70	5.64	7.49	6.86	9.01	6.40	8.40
Depreciation	4.97	6.45	4.08	5.41	5.04	6.61	4.70	6.16
Interest on average cost	1.07	1.39	1.02	1.36	1.15	1.53	1.08	1.42
Repairing cost	0.66	0.86	0.54	0.72	0.67	0.88	0.62	0.82
k. Tools and equipment* (depreciation + repairing)	0.24	0.32	0.21	0.28	0.27	0.35	0.24	0.32
l. Interest on operating capital	2.89	3.35	2.76	3.65	2.76	3.62	2.81	3.61
m. Land use cost	0.14	0.18	75.52	0.13	0.06	0.08	0.10	0.13
Total costs (A+B)	76.50	100.00	75.52	100.00	76.35	100.00	76.12	100.00

Source: Own calculation data from field survey (2005)

Note: Batch = a batch consisted of 35 days on an average for all farms, and average. Live-weight of a bird in 35 days was 1.44 kg (small farm), 1.45 kg (medium farm), 1.43 kg (large farm) and 1.44 kg (all farms). Therefore total cost per kg was Tk. 53.13. (Small farm), Tk. 52.08 (medium farm), Tk. 53.39 (large farm) and Tk.53.83 (all farms).

* Tools and equipment = Water pot, Feed pot, Feed trey, Mat, etc.

Returns from broiler production

The Gross returns per farm per year, per batch per farm and per bird stood at Tk. 556784, Tk. 77305 and Tk. 83.66 respectively for small broiler farms. The gross returns per farm per year, per batch per farm and per bird stood at Tk. 695833, Tk. 112229 and Tk. 84.36 respectively for medium broiler farms. The gross returns per farm per year, per batch per farm and per bird stood at Tk. 1345329, Tk. 197843 and Tk. 83.83 respectively for large broiler farms. The gross returns per farm per year, per batch per farm and per bird stood at Tk. 865230, Tk. 129135 and Tk. 83.95 respectively for all broiler farms (Table 2).

Gross margins per bird were Tk. 19.92, Tk. 19.69, Tk. 19.01 and Tk. 19.54 for small, medium, large and all broiler farms respectively. Net returns per bird per batch were calculated at Tk. 7.16 for small farms, Tk. 8.84 for medium farms, Tk. 7.48 for large farms and Tk. 7.83 for all broiler farms.

BCR with variable costs and BCR with total costs were estimated at Tk. 1.30 and Tk. 1.09, Tk. 1.31 and Tk. 1.12, Tk. 1.29 and Tk. 1.10, and Tk. 1.30 and Tk. 1.10 for small, medium, large and all broiler farms respectively. The above findings support the rejection of the hypothesis (ii). This means that the broiler farming was profitable in the study area.

Table 2. Gross return, gross margin, net return and BCR (undiscounted) per farm per year, per batch per farm, and per bird per batch for small, medium, large and all farms

-Values in Tk.-

Particulars	Farms	Per farm / year	Per batch /farm	Per bird / batch
A. Gross return	Small	556784	77305	83.66
	Medium	695833	112229	84.36
	Large	1345329	197843	83.83
	All	865230	129135	83.95
B. Variable cost	Small	428492	59512	63.74
	Medium	532658	85913	64.67
	Large	1042079	153248	64.82
	All	667743	99558	64.41
C. Fixed cost	Small	84049	11674	12.76
	Medium	88197	14225	10.85
	Large	181324	26665	11.53
	All	117857	17521	11.71
D. Total cost (B+C)	Small	512541	71186	76.50
	Medium	620855	100138	75.52
	Large	1223403	179913	76.35
	All	785600	117079	76.12
E. Gross margin (A_B)	Small	128292	17793	19.92
	Medium	163175	26316	19.69
	Large	302250	44595	1901
	All	197487	29577	19.54
F. Net return (E_C)	Small	44243	6119	7.16
	Medium	74978	12091	8.84
	Large	121926	17930	7.48
	All	79630	12056	7.83
G. Benefit –cost ratio (A / B)	Small	1.30		
	Medium	1.31		
	Large	1.29		
	All	1.30		
H. Benefit-cost ratio (A / D)	Small	1.09		
	Medium	1.12		
	Large	1.10		
	All	1.10		

Source: Own calculation data from field survey (2005)

Functional analysis

In determining the effects of the variable inputs, Cobb-Douglas production function was predictable for broiler production. Data were converted into per farm per year basis to facilitate the analysis. To explore the input-output relationship of broiler production, the selected Cobb-Douglas form of production function model in its stochastic form may be expressed as:

$$Y = aX_1^{\beta_1} X_2^{\beta_2} X_3^{\beta_3} X_4^{\beta_4} e^{u_i}$$

The Cobb-Douglas Production function was linearized by transforming it into the following double log or log linear form so that it could be solved by the least square method.

$$\ln Y = \ln a + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + U_i$$

Where,

Y = Gross return from broiler production (Tk./farm/year)
a = Constant or intercept of value
X_1 = Cost of feed (Tk./farm/year)
X_2 = Cost of day-old-chicks (Tk./farm/year)
X_3 = Cost of human labour (Tk./farm/year)
X_4 = Veterinary charge (Tk./farm/year)
β_{1-4} = Regression coefficients
U_i = Error term

The regression co-efficients of feed cost, day-old-chick cost, human labour cost and veterinary cost were significant and positive for all farm categories and negative only in case of human labour cost for small farm category. These reveal that increase in feed cost, day-old-chick cost, human labour cost and veterinary cost keeping other factors constant, would result in an increase in the gross return for all farm categories. But in case of small farm an increase in human labour cost, keeping other factors constant, would result in a decrease of gross returns for small farms.

The elasticity of broiler farms (Return to Scale) stood at 0.457, 0.902, 0.551 and 0.631 for small, medium, large and all broiler farms, respectively. This implies that if all the inputs specified in the production function were increased simultaneously by 1 per cent, the gross return would increase by 0.457 per cent, 0.902 per cent, 0.551 per cent and 0.631 per cent for small, medium, large and all broiler farms, respectively. It is observed that the summation of elasticity of different inputs for broiler farms was less than one, implying that the production function exhibited decreasing returns to scale i.e., doubling the inputs will less than double the output. Therefore, on the whole, the management of the individual farms may have to consider further allocating additional resources or expanding the size of the existing farm.

Creation of employment opportunities

In case of small farms, total labour man-days per farm were 816 of which 69 per cent was family labour and 31 per cent was hired labour (Table 3). Of the total man-days the share of female hired labour was 6.25 per cent and 24.75 per cent was male hired labour. For medium farms, total labour utilized were 721 man-days of which 35.37 per cent was hired labour and 64.63 per cent was family labour. Of the total man-days the share of female hired labour was 8.60 per cent and 26.77 per cent was male hired labour. For large farms, total labour man-days were 994 of which 32.19 per cent was hired and 67.81 per cent was family labour. Of the total man-days the share of female hired labour was 10.26 per cent and 21.93 per cent was male hired labour. For all broiler farms, the average man-days utilized were 843.67 of which 32.71 per cent was hired labour and 67.29 per cent was family labour. Of the total man-days the share of female hired labour was 8.5 per cent and male hired labour was 24.21 per cent.

Most of the family labour (38 per cent) came from female especially small farm. The private poultry farming creates the job opportunities for the educated family members of the farm families. Out of the 844 labourers 67 per cent supplied by the farm families members and only 33 per cent supplied by the outside of the farm families.

The highest number of family labour (69.03 per cent) was engaged in small farms. On the other hand, the use of hired labour was the highest (35.34 per cent) in medium broiler farms. However, each type of farm has contributed significantly to the creation of self employment/productive wage employment in the study area. It implies that broiler farming is playing a crucial role in creating employment opportunity in the rural and semi-urban areas of Bangladesh.

On an average a farm having 1538 birds per batch, invested a yearly sum of Tk. 785600, generated additional employment in terms of self employment and wage labour, 843.76 man-days implying that each 100 Taka invested in broiler farming created 0.107 employments in man-days term.

Table 3. Patterns of labour utilization in different categories of private broiler farms

Categories of farms	Nature of labour						Total man-days (1+2)
	Family labour (Man-days)			Hired labour (Man-days)			
	Male	Female	Sub-total (1)	Male	Female	Sub-total (2)	
Small	253 (31)	310 (38)	563 (69)	202 (24.75)	51 (6.25)	253 (31)	816 (100)
Medium	273 (37.86)	193 (26.77)	466 (64.63)	193 (26.77)	62 (8.60)	255 (35.37)	721 (100)
Large	504 (50.70)	170 (17.11)	674 (67.81)	218 (21.93)	102 (10.26)	320 (32.19)	994 (100)
All farms	343.33 (40.69)	224.33 (26.60)	567.67 (67.29)	204.33 (24.21)	71.67 (8.50)	276 (32.71)	843.67 (100)

Source: Own calculation data from field survey (2005)
Note: Figures within the parentheses indicate the percentage of the total

Expenditure patterns

Small farms used 61.21, 11.00, 3.50, 2.81 and 1.58 per cent of their expenditure on food, clothing, housing, education and medication respectively. Medium farms used 48.01, 11.80, 3.85, 6.90 and 8.20 per cent of their expenditure on food, clothing, housing, education and medication respectively. Large farms used 39.75, 13.40, 3.20, 14.42 and 7.25 per cent of their expenditure on food, clothing, housing, education and medication respectively. All broiler farm families used 45.14, 12.68, 3.37, 10.95 and 6.39 per cent of their expenditure on food, clothing, housing, education and medication respectively. In large farms, the percentage of expenditure on food was relatively lower than that of small and medium farms. On the contrary, in large farms, the percentage of the total expenditure on education and medicine were higher than that of small and medium farms.

Small, medium, large and all broiler farms saved annually 60.25, 68.99, 40.99 and 52.64 per cent of the total income respectively. These savings were for their future security, for purchasing land properties and other expenses which were not covered in this study.

Conclusions

From the view point of profitability, income and employment generation particularly of woman employment generation, private poultry farming appears to be a very promising sub-sector which can be identified as a "Thrust Sector". It has an enormous potentiality for expansion. As a matter of fact, investments were rushing in the poultry sector in general for the last few years but due to bottleneck related to price, marketing, disease, feed and chicks availability,

many of these farms could not stand the temporary shocks and had to wind up their business. The scenario in the private poultry farming is that almost every day there are new farms coming up and some of the old ones closing down. It appears that the business environment is quite hazy and full of risk and uncertainty. Medium farmers earned more profit compared to large and small farmers. In the case of employment large farmers generated more employment compared to small and medium farmers. The big farms can mutually plan the establishment of more hatcheries in the country to increase the supply of day-old-chicks and plan buying back the adult birds. This would help expand the poultry farming venture in the private sector in one hand and thus opens up newer employment opportunities, on the other. The Government as well as the Non-government Organizations may come forward to assist sustainable development of poultry enterprises with the provision of adequate inputs, medicare and marketing facilities.

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