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Rural Duck Farming: An Approach to Socio-economic Improvement

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Abstract: *Duck farming is a promising sector in Bangladesh. A tremendous growth of duck population, number of duck farms, production and consumption of meat and egg, employment generation, investment in commercial duck farms have been occurred in this sector in last 20 years. The present study is an attempt to asses the socio-economic impact of rural duck farming in selected areas of Rajshahi district keeping in view to i) assess the social improvement through rural duck farming; ii) analyze the economic improvement of the duck farmers; and iii) identify the major problems faced by the farmers and to make some suggestions for their solution. And it is found in the study that family nutrition, housing condition, drinking water, sanitation, healthcare services, clothing condition, educational capability, household asset and awareness of the respondent farmers were increased significantly.*

1.0 Introduction

Bangladesh is a land of rivers. Natural wetlands like rivers, beels, ponds, haor, etc. create favorable conditions for duck raising. It is an old profession in rural Bangladesh. There is a great potential of duck farming in rural areas of Bangladesh where various natural wetlands are available. Duck has nutritional, economic and commercial importance. It needs minimum capital but generates higher profit. Due to the presence of huge number of natural wetlands farmers have to supply less amount of feed to ducks. As a result, it brings higher profit through out the year. Duck farming requires less feed, less care and attention and they are more disease resistant than other poultry birds. Due to these versatile advantages duck farming has already been recognized as an important

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instrument for socio-economic improvement in Bangladesh. Mahmud reports that farmers by keeping 200 ducks can maintain a modest living by adopting duck farming as a supplementary source of income.[5] Now duck farming has become a very profitable business. Duck farming has created self-employment for the unemployed youth. In recent years the duck production has increased considerably. But research on this important business is very scanty. So, intensive research should be done on this important issue. The present study is an attempt to asses the socio-economic impact of rural duck farming in selected areas of Rajshahi district with the following objectives:

1) To assess the social improvement through rural duck farming
2) To analyze the economic improvement of the duck farmers and
3) To identify the major problems faced by the farmers and to make some suggestions for their solution.

2.0 Methodology

To attain the stated objectives of the study, three upazilas under Rajshahi district namely: Bagmara, Bagha and Tanore were selected purposively due to comparatively higher concentration of duck farms in these areas. Another reason was- no socio-economic study of this type was conducted previously in this region. According to the information supplied by District Livestock officer, Rajshahi, there are 130 duck farms in the study area. A total of 60 farmers (20 from each upazila) were randomly selected as study sample respondent for the collection of primary data. For in-depth study three case studies and one focus group discussions (FGDs) were also done. For the collection of primary data mainly direct interview method was conducted using pre-tested structured questionnaire. Both quantitative and qualitative data were collected from primary and secondary sources. The secondary data sources was concerned government documents, related literatures, books, journals, news papers, articles, theses, and web sites. The data were collected during February 2012 to April 2012 by trained data collectors.

Socio-economic improvement of the farmers through duck farming was the main focus of this study. This improvement was measured by various socio-economic variables/indicators like family nutrition, housing condition, sanitation, drinking water, clothing condition, healthcare

[5] M.A.A. Mahmud, "An Economic Analysis of Duck Raising in Some Selected Haor Areas of Kishorganj District", (Mymensingh: M.S. Thesis, Department of Agricultural Economics, Bangladesh Agricultural University, Mymensingh, 1998), pp. 60-69.

facilities, household asset generation, educational capability, awareness build-up, annual income, annual expenditure, annual savings, employment generation, profit from duck farming and utilization of duck meat and egg. Conventional procedure used in Social Science studies was followed to measure the variables of the present study.

All the collected data was processed and analyzed according to the objectives of the study. The qualitative data was converted into quantitative one by assigning appropriate scores/scaling. Descriptive statistics such as mean, percentage, range, standard deviation and ranking were used to describe the variables/indicators of the study. To show the significant differences between the two periods (Before and after farming) of same variables t-test was done. The data was analyzed by using the SPSS software. After analysis of data results were presented in various tables and graphs.

3.0 Findings of the Study

3.1. Socio-economic Characteristics of the Respondent Farmers

3.1.1 Age

The age of the farmers ranged from 24 years to 52 years. The mean age of the farmers was 34.48 years with standard deviation 8.94. On the basis of age (years) the farmers of the study area were classified into three groups as shown in Table 1. Data presented in Table 1 indicate that the majority of the farmers (60%) were young followed by middle-aged (38%) and old (2%) in the study area.

3.1.2 Education

Education scores of respondent farmers ranged from 3 to 14 with mean 7.40. The standard deviation value was 3.05 for duck farmers of the study area. According to the level of education the farmers were classified into three categories which are shown in Table 1. Data presented in Table 1 express that the highest proportion of farmers (65%) belonged to secondary level followed by primary (27%) and above secondary (8%) level of education.

3.1.3 Occupation

The occupation of the respondent farmers are shown in Table 1. From the table it is evident that most of respondents of farmers had farming (50%) as their main occupation followed by agriculture (32%), business (13%)

and service (5%). The participant duck farmers have some subsidiary occupation which helps them in earning some extra income.

3.1.4 Marital status

Marital status of the farmers is shown in Table 1. From the data presented in the table, it is seen that majority of the duck farmers (68%) were married followed by unmarried (17%), divorced (13%) and others (2%).

3.1.5 Family size of the farmers

The family size of the participant farmers ranged from 2.00 to 7.00 numbers in duck farmers. The mean family size of the participants was 4.53 with standard deviation 0.82. On the basis of the number of family members, the respondent farmers were classified into three categories as shown in Table 1. Data show that small family size was the highest (57%) followed by medium (31%) and large family (12%). It is also seen from the table that average family size is smaller than national level.[6]

3.1.6 Farm size

The farm size of the respondent farmers was found ranging from 0.03 hectare to 2.00 hectare. The mean farm size was 0.18 hectare with standard deviation 0.24. Depending on the farm size the poultry farmers were classified into five categories followed by the rules of Department of Agriculture Extension, Government of the People's Republic of Bangladesh as shown in Table 1. Data furnished in Table 1 represent that the highest proportion of the respondent farmers had marginal farms (75%) followed by small farms (15%) and medium farms (10%). Proportion of large and landless farms was zero.

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[6] Bangladesh Bureau of Statistics(BBS), Bangladesh Population Census Report 2001:Community Series: Zila Rajshahi (Dhaka: Reproduction, Documentation and Publishing Wing, BBS, Planning Division, Ministry of Planning, Government of the People's Republic of Bangladesh, 2001), pp.61-62.

Table 1: Socio-economic Characteristics of the Respondent Farmers

Characteristics	Participants		Mean	Standard Deviation
	Category	Frequency		
Age(year)	Young (up-to 35) Middle-aged (36-50) Old (Above 50)	36 (60) 23 (38) 1 (2)	34.48	8.94
Education (schooling year)	Primary (1-5) Secondary (6-10) Above secondary (>10)	16 (27) 39 (65) 5 (8)	7.40	3.05
Family size(no.)	Small (Up-to 4) Medium (5-6) Large (Above 6)	34 (57) 19 (31) 7 (12)	4.53	0.82
Occupation	Agriculture Service Business Farming	19 (32) 3 (5) 8 (13) 30 (50)	--	--
Marital status	Married Unmarried Divorced Others	41 (68) 10 (17) 8 (13) 1 (2)	--	--
Farm size (hectare)	Landless (upto-0.02) Marginal (0.0210.20) Small (0.21-1.00) Medium (1.01-3.00) Large (Above 3.00)	0 (0) 45 (75) 9 (15) 6 (10) 0 (0)	0.18	0.24
Sex	Male Female	42 (70) 18 (30)	--	--
Training (day)	No training Short (1-7) Moderate (8-15) Long (Above 15)	43 (72) 5 (8) 10 (17) 2 (3)	3.92	7.28

Source: Field survey 2012

3.1.7 Sex of the Farmers

Table 1 represents the sex ratio of the participant farmers. Out of 60 respondent farmers 18(30%) were female. For their socio-economic benefits women are also operating duck farms now-a-days. The male-female ratio of participant duck farmers was 7:3.

3.1.8 Training Received

Sometimes local livestock department and NGOs arrange training for the poultry and dairy farmers. The information about training received by the respondent farmers is shown in Table 1. On the basis of training score the respondent farmers were classified into three categories namely: No, short, moderate and long training. Data presented in Table 1 indicate that highest proportion (72%) of the farmers had no training. Only 17%, 8% and 3% farmer had moderate, short and long training respectively. However, average duration of training of the above mentioned farmers were 3.92 days.

3.2 Social Improvement through Duck Farming

3.2.1 Impact on Family Nutrition

The impact of rural duck farming is shown in Table 1 and Figure 1. From the collected data it is seen that before starting duck farming meals/day, meat-fish/week, egg-milk/week and fruits/week were 2.28, 0.78, 0.49 and 0.36 which increased to 2.78, 1.42, 0.97 and 0.82 respectively after introducing farming (Figure 1). The average consumption of above food item were increased by 22 %, 82 %, 98 % and 128 % respectively in duck farm families. Before farming mean nutritional status score of duck farm families was 3.84 which increased to 5.99 after stating duck farming. The overall changes of the nutritional status score were 56 % which was significant at 1 % level of probability.

Table 1: Changes in Nutritional Status of Duck Farmers

Nutritional particulars	**Changes in consumption of individual food item (times)**			**Changes in mean nutritional score**			
	Before	After	Change (%)	Before	After	Change (%)	t-value
Meals/day	2.28	2.78	22	3.84	5.99	56	22.56**
Meat/fish/wk	0.78	1.42	82				
Milk/egg/wk	0.49	0.97	98				
Fruits/wk	0.36	0.82	128				

Note: ** t- value is significant at 1% level of probability, wk=week
Source: Field survey 2012

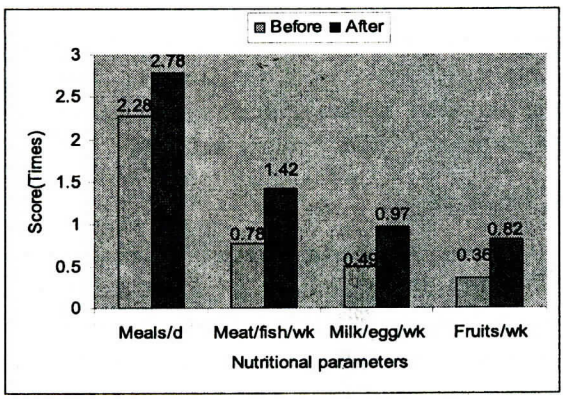

Figure 1: Changes in Nutritional Score of the Farmers

3.2.2 Impact on Housing Condition

The impact of duck farming on housing condition is presented in Table 2 and Figure 2. The data contained in Table 2 indicate that duck farming has

a significant impact (p?0.01) on housing condition of the respondents. Before introducing duck farming 47%, 27%, 17% and 9% farmers possess katcha, tin-shed, semi-building and building houses respectively but after starting farming business these figures were changed to 20%, 32%, 23% and 25% respectively (Figure 2). The collected data show that number of tin-shed, semi-building and building houses was increased by 19%, 75% and 87% respectively in duck farm families (Table 2). On the other hand, number of Katcha (bamboo/straw-made) houses was decreased by 57 %. This indicates that inferior quality houses are decreasing day-by-day. The overall changes in the mean score of housing condition were 33% in the above mentioned farm families which were significant at 1% level of probability (p?0.01).

Table 2: Changes in Housing Condition of the Farmers

Type of housing	Changes in frequency			Changes in mean score			
	Before	After	Change(%)	Before	After	Change (%)	t-value
Katcha	28 (47)	12 (20)	-57	1.90	2.53	33	8.81**
Tin-shed	16 (27)	19 (32)	19				
Semi-build.	10 (17)	14 (23)	75				
Building	6 (9)	15 (25)	87				

Note: ** Significant at 1% level of probability
Source: Field survey 2012

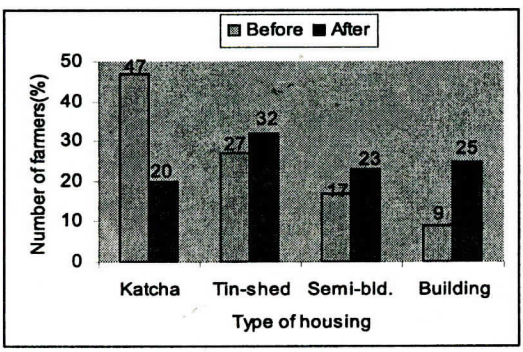

Figure 2: Changes in Housing Condition,

Note: Semi.bld.= Semi-building

3.2.3 Impact on Sanitation

Table 3 and Figure 3 represent the sanitary changes after duck farming of the respondents. The number of farmers having katcha, semi-building and building latrine were 58%, 30% and 12% respectively which reached to

20%, 55% and 25% respectively (Figure 3). From data presented in Table 3 it is illustrated that after starting duck farming semi-building and building latrine were increased by 83% and 114% respectively in duck farm families. At the same time the number of Katcha (bamboo/straw-made) latrine was decreased by 66%. The overall increment in sanitation score of duck farm families was 34%. So, there was significant difference in sanitation status of the farmers between the two periods. It indicates that duck farming has brought a positive and significant ($p<0.01$) changes in the pattern of latrine use.

Table 3: Changes in the use of Sanitary Latrine

Type of housing	**Changes in frequency**			**Changes in mean score**			
	Before	After	Change(%)	Before	After	Change (%)	t-value
Katcha	28 (47)	12 (20)	-57	1.90	2.53	33	8.81**
Tin-shed	16 (27)	19 (32)	19				
Semi-build.	10 (17)	14 (23)	75				
Building	6 (9)	15 (25)	87				

Note: ** Significant at 1% level of probability, Source: Field survey 2012

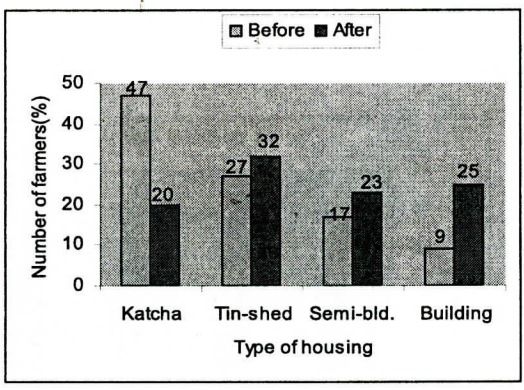

Figure 3: Changes in Sanitation Status,
Note: Semi-bld= Semi-building

3.2.4 Impact on Drinking Water

The data contained in Table 4 indicate that the number of respondents using own tube well water were increased by 200% in duck farm families after introducing duck farming. On the other hand, number of farm families sharing drinking water with others' tube well was decreased by 40%. The increment of using own tube well water was comparatively

high in farm families. At the same time dependency on others' tube well was decreased in the above mentioned farm families. The overall changes in mean score of duck farm families were 22%. There was a significant difference ($p<0.01$) between the uses of sources of drinking water between before and after farming situations.

Table 4: Changes in the Source of Drinking Water

Sources of water	Change in frequency			Change in mean score			
	Before	After	Change (%)	Before	After	Change (%)	t-value
Shared with others	50 (83)	30 (50)	-40	1.17	1.50	22	6.49**
Own TW	10 (17)	30 (50)	200				

Note: Figures in parenthesis are percentages, TW= Tube well, ** t- value is significant at 1% level of probability, Source: Field survey 2012

3.2.5 Impact on Clothing Condition

The changes in clothing condition are shown in Table 5 and Figure 4. The mean clothing score for male, female, winter season and ceremony were 1.93, 1.90, 1.51 and 1.43 respectively which increased to 2.58, 2.98, 2.31 and 1.74 respectively (Figure 4). The changes in the use of four types of garments for male, female, winter season and ceremony were 34%, 56%, 53% and 22% respectively in duck farm families (Table 5). Before farming mean clothing status score of duck farm families were 6.77 which increased to 9.61 after involving duck farming. The overall changes in clothing condition were 42% which was significant at 1 % level of probability.

Table 5: Changes in Clothing Condition of the Respondent

Type of Garments	Changes in the capability of using individual garment			Changes in overall mean capability score			
	Before	After	Change (%)	Before	After	Change %)	t-value
Male	1.93	2.58	34	6.77	9.61	42	14.23**
Female	1.90	2.98	56				
Winter	1.51	2.31	53				
Ceremonial	1.43	1.74	22				

Note: ** t- value is significant at 1% level of probability
Source: Field survey 2012

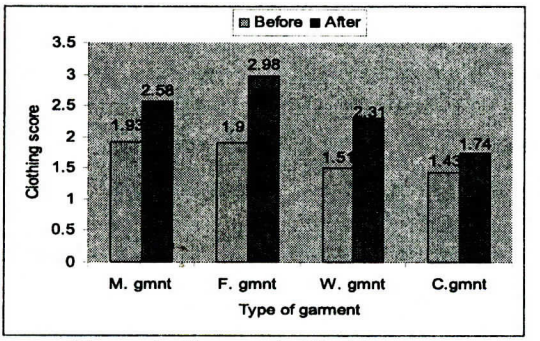

Figure 4: Changes in Clothing score
Note: M= Male, F=Female, gmnt= garment

3.2.6 Impact on Educational Capability

Table 6 and figure 5 show the changes in educational capability of the respondents after duck production. From the collected data shown in Table 6, it is evident that all the respondent farmers were capable to educate their children in primary and secondary level in both before farming and after farming period. Remarkable changes were found in the ability to educate sons and daughters in both college and university level after farming business. Before starting duck farming about 50% and 28% duck farmers were able to educate their sons and daughters in college and university level respectively. But after adopting duck farming the number of capable farmers was increased to 67% and 43% respectively (Figure 5). The overall increment in mean educational capability score was 17% ($p<0.01$).

Table 6: Changes in the Educational Capability of the Farmers

Type of education	**Changes in frequency of capable farmers**			**Changes in mean ability score**			
	Before	After	Change (%)	Before	After	Change (%)	t-value
Primary	60 (100)	60 (100)	00	5.47	6.42	17	8.09**
Secondary	60 (100)	60 (100)	00				
College	30 (50)	40 (67)	33				
University	17 (28)	26 (43)	53				

Note: Figures in parenthesis are percentages, ** t- value is significant at 1% level of probability
Source: Field survey 2012

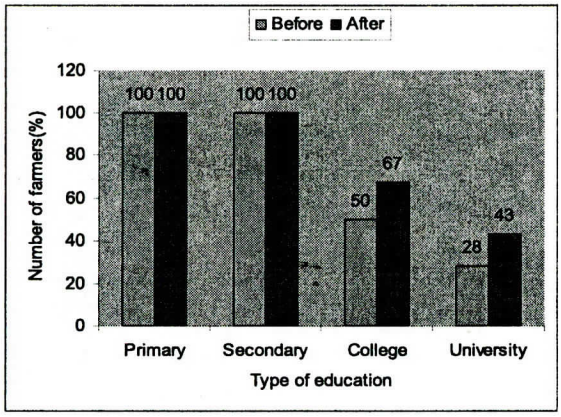

Figure 5: Changes in Educational Capability

3.2.7 Impact on Healthcare Services

The changes in healthcare services of the respondent farmers are shown Table 7 and Figure 6. The data furnished in Table 7 show that before starting farming 40%, 38%, 12% and 10% farmers avail healthcare services from homeopathic doctor, village doctor, government hospital and MBBS/specialist doctor respectively but after starting duck farming these figures were changed to 25%, 30%, 27% and 18% respectively(Figure 6). Healthcare services from government hospital and MBBS/specialist doctor were increased by 128% and 83% respectively in duck farm families. On the other hand, going to homeopathic doctor and village doctor were decreased by 37% and 22% respectively (Table 7). The overall changes in healthcare services were 24% in the above mentioned farm families which were significant at 1% level of probability ($p<0.01$).

Table 7: Changes in Healthcare Services

Type of health care service	**Changes in frequency (%)**			**Changes in mean score**			
	Before	After	Change (%)	Before	After	Change (%)	**t-value**
Homeopathy	24 (40)	15 (25)	-37	1.92	2.38	24	7.00**
Village doctor	23 (38)	18 (30)	-22				
Govt. hospital	7 (12)	16 (27)	128				
MBBS/specialist	6 (10)	11 (18)	83				

Note: Figures in parenthesis are percentages, ** t- value is significant at 1% level of probability
Source: Field survey 2012

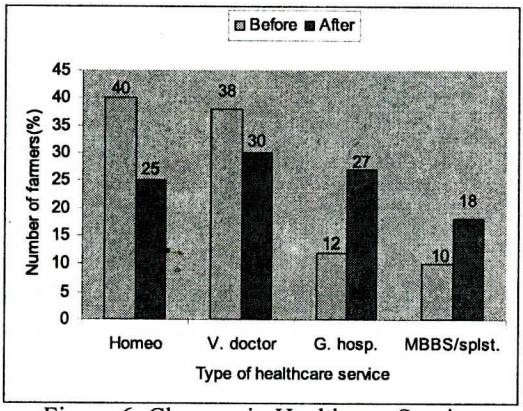

Figure 6: Changes in Healthcare Service
Note: V= Village, G.hosp= Government hospital, splst= Specialist

3.2.8 Impact on Household Asset Generation

The changes in household asset generation are presented in Table 8. From the obtained data it is evident that before operating duck farming the mean size of various essential household assets like cot, chowki, chair, table, alna, bicycle, television, motor cycle, jewelry and mobile phone were 0.43, 1.97, 2.47, 0.70, 0.90, 0.52, 0.17, 0.016, 5.83, and 0.50 respectively which were increased to 0.78, 2.28, 4.02, 1.53, 1.60, 0.60, 0.30, 0.05, 7.63 and 1.28 respectively. The rate of increment for above asset were 81%, 16%, 63%, 118%, 78%, 15%, 76%, 212%, 31% and 156% respectively. On the other hand, before starting farming the mean price of household asset were Tk. 3100, Tk. 4170, Tk. 2600, Tk. 2050, Tk. 1580, Tk. 4150, Tk. 4180, Tk. 1670, Tk. 10180 and Tk. 2330 respectively which increased by 126%, 20%, 106%, 118%, 77%, 20%, 39%, 289%, 50% and 145% respectively. Rural duck farming has brought a significant ($p<0.01$) change in overall household asset generation by 74% on mean price basis. The changes in mean price of cot, chowki, chair, table, alna, bicycle, television and mobile phone were statistically significant ($p<0.01$ and (p?0.05). On the contrary, the changes in mean price of motor cycle and jewelry were not statistically significant ($p<0.05$). The reason might behind it is both motor cycle and jewelry is very costly item in present days. The duck farmers have given priorities on other necessary household assets.

Table 8: Changes in Household Asset

Name of Asset	Changes in mean size of asset			Changes in mean price (Tk.)			
	Before	After	Change (%)	Before	After	Change (%)	t-value
Cot	0.43	0.78	81	3100	7020	126	5.69**
Chowki	1.97	2.28	16	4170	5000	20	4.64**
Chair	2.47	4.02	63	2600	5780	106	8.86**
Table	0.70	1.53	118	2050	4480	118	11.95**
Alna	0.90	1.60	78	1580	2800	77	7.98**
Bicycle	0.52	0.60	15	4150	5000	20	3.13*
TV	0.17	0.30	76	4180	5820	39	2.90*
M.cycle	0.016	0.05	212	1670	6500	289	1.81^{NS}
Jewelry	5.83	7.63	31	10180	15270	50	2.79^{NS}
M. ph	0.50	1.28	156	2330	5720	145	6.05**
Total	--	--	--	36510	63383	74	6.16**

Note: TV=Television, M.cycle= Motor cycle, M.Ph.= Mobile phone ** t- value is significant at 1% level of probability,

Source: Field survey 2012

3.2.9 Impact on awareness build-up

Obtained data shown in Table 9 illustrate that before starting duck farming proportion of low level awareness was highest (80%) followed by medium (13%) and high level (7%). After joining duck farming the same trend was found that is low level awareness was highest (48%) followed by medium (37%) and high (15%). But the level of awareness was improved. The number of farmers bearing medium and high level awareness was increased by 175% and 125% respectively. On the other hand, the number of farmers having low level awareness was decreased by 39%. At the same time overall score were increased by 44% in the above farm families. The changes regarding awareness build-up was significant at 1 % level of probability ($p<0.01$).

Table 9: Changes in Awareness Build-up

Level of awareness	Changes in frequency			Changes in mean score			
	Before	After	Change (%)	Before	After	Change (%)	t-value
Low- up-to 8	48 (80)	29 (48)	-39	7.72	11.12	44	14.08**
Medium 9-13	8 (13)	22 (37)	175				
High-14-15	4 (7)	9 (15)	125				

Note: Figures in parenthesis are percentages, ** t- value is significant at 1% level of probability.

Source: Field survey 2012

3.3 Economic Improvement through Duck Farming

3.3.1 Impact on Annual income of the Respondents

The data contained in Table 10 indicate that before starting duck farming highest proportion (50%) of the farmers belonged to low income group followed by medium (30 %) and high (20%) income group. After introducing duck farming the trend regarding level of income of participant farmers was found to be slightly changed that is medium level income group was highest (43%) followed by low (33%) and high level (24%) group(Medium>Low>High)(Figure 7). The mean annual family income of the above mentioned farm families were Tk. 127000 in before farming period. But in post farming situations annual income of duck farmers were increased to Tk. 205000. The overall change was 61 % in the above mentioned farm families. The increments in annual family income of the respondent farmers after introduction of duck farming were statistically significant ($p<0.01$) over the respective before farming value.

Table 10: Changes in annual income of the duck farmers

Level of income('000')	**Changes in frequency**			**Changes in mean income (Tk.)**			
	Before	After	Change (%)	Before	After	Change (%)	t-value
Low-60-106	30 (50)	20 (33)	-33	127000	205000	61	13.26**
Medium 107-150	18 (30)	26 (43)	44				
High-151-360	12 (20)	14 (24)	17				

Note: ** t- value is significant at 1% level of probability, Figures in parenthesis are percentages.

Source: Field survey 2012

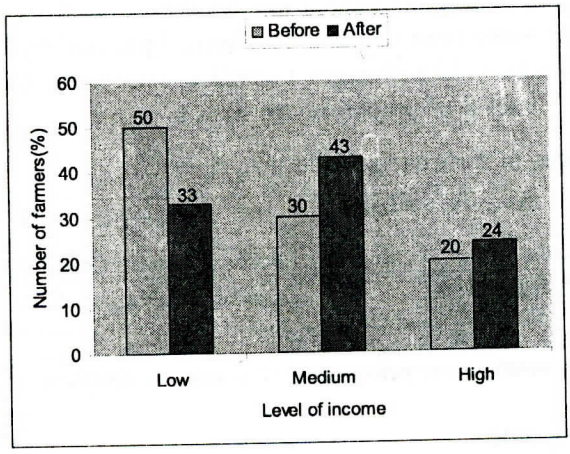

Figure 7: Changes in the Level of Income

3.3.2 Impact on Annual Expenditure

Table 11 shows the changes in annual expenditure of the duck farmers. Data presented in the table show that before starting duck farming highest proportion (52%) of the farmers belonged to low expenditure group followed by medium (30%) and high (18%) expenditure group (Table 11). After introducing duck farming the proportion of farmers belonged to medium expenditure group (42%) was highest followed by low (32%) and high (26%) expenditure group i.e. the trend was slightly changed (Medium>Low>High).After starting duck farming the number of farmers having medium and high level expenditure capability were increased by 39% and 45% respectively. On the other hand, the number of low level expenditure group was decreased by 39%. However, the total annual family expenditure of the above mentioned farm families were Tk. 116000 in before farming period. But after involving duck farming annual expenditure of duck farm families were increased to Tk. 179000. The overall changes in family expenditure were 54%. The increments in annual family expenditure of the respondent farmers after introduction of duck farming were statistically significant ($p<0.01$).

Table 11: Annual Expenditure of the Respondents

Level of expe.('000')	**Changes in frequency**			**Changes in mean expenditure (Tk.)**			
	Before	After	Change (%)	Before	After	Change (%)	t-value
Low-60-100	31 (52)	19 (32)	-39	116000	179000	54	15.13**
Medium101-141	18 (30)	25 (42)	39				
High 142-300	11 (18)	16 (26)	45				

Note: Expe.= Expenditure, ** t- value is significant at 1% level of probability, Figures in parenthesis are percentages

Source: Field survey 2012

3.3.3 Impact on annual savings

Data presented in Table 12 indicate that before starting duck farming highest proportion (52%) of the farmers belonged to low savings group followed by medium (32%) and high (16%). But after introducing duck farming highest proportion of farmers were medium level savings group (43%) followed by low level (35%) and high level (22%) (Figure 8) i.e. the trend was somewhat changed (Medium>Low>High). However, mean annual family savings of duck farm families were Tk. 11000 in before farming period which increased to Tk. 26000 in post farming situation. The overall changes in annual savings were 142% in duck farm families.

The increments in annual family savings of the respondent farmers after introduction of duck farming were statistically significant at 1% level of probability (p?0.01).

Table 12: Change in Annual Savings of the Duck Farmers

Level of savings ('000')	**Changes in frequency**			**Changes in mean savings (Tk.)**			
	Before	After	Change (%)	Before	After	Change (%)	t-value
Low-0-8	31 (52)	21 (35)	-32	11000	26000	142	11.12**
Medium 9-17	19 (32)	26 (43)	37				
High-18-60	10 (16)	13 (22)	30				

Note: ** t- value is significant at 1% level of probability, Figures in parenthesis are percentages

Source: Field survey 2012

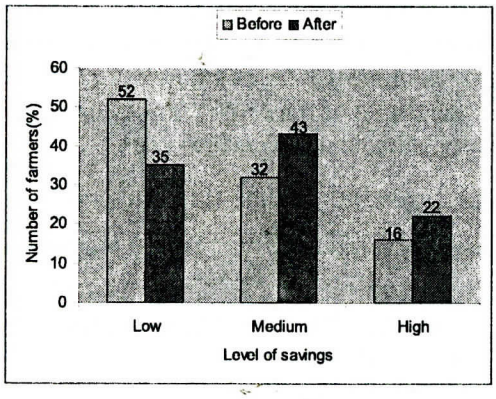

Figure 8: Changes in the level of savings

3.3.4 Impact on Employment Generation

Impact on employment generation is shown in Table 13 and Table14. Out of 60 respondent farmers, 25 farmers appoint 25 paid laborers out of which 5 are female. Mean paid employment per duck farm (no.) were 0.42(male 0.33/farm and female 0.09/farm) (Table 13). Mean labor hour per farm per day for male and female laborer were 10 hours and 8 hours respectively (Table 14). Mean female labor hour was 25% less than that of male ones which was reflected in their monthly salaries. Mean monthly salary of paid male and female laborer were Tk. 4360 and Tk. 3600 respectively (Table 13). Monthly salary of female laborer was 25% less than male laborer. This was due female laborers have to work less time than that of male counterpart on humanitarian ground.

Table 13: Employment Generations per farm

Type of employment	Mean employment per farm			Salary Tk. per month		
	Male	Female	Total	Male	Female	Mean
1. Paid employment	0.33	0.09	0.42	4360.00	3600.00	3980.00
2. Self-employment	1.00	0.58	1.58	--	--	--

Source: Field survey 2012

Table 14: Labor Hour in Duck Farm

Type of employment	Labor hour per farm		
	Male	Female	Mean
1. Paid employment	10	8	9
2. Self-employment	10	4	7

Source: Field survey 2012

3.3.6 Annual Profit from Duck Farm

Annual net profit is presented in Table 15. Presented data show that net profit from small, medium and large farms were Tk. 85353, Tk. 164795 and Tk. 248053 respectively. Where overall mean profit was Tk. 171504. The data indicate that mean profit was highest (Tk. 248053) in large farm group (flock size >252) followed by medium (Tk.164795) (flock size (151-251) and small (Tk.85353) (flock size 50-150) farm group. From this fact it can be interpreted that rural duck farmer can earn one an average Tk. 7000 to Tk. 20000 per month with a minimum efforts. From a report of The Daily Kalerkantha it has been seen that a mobile duck farmer can earn about Tk. 25000 per month with very minimum capital.[7] Mahmud observes that annual profit from large scale duck farm was Tk. 331000.[8]

Table 15: Annual Profit from Duck Farm

Flock size(no.)	**Frequency**	**Size-wise mean annual profit (Tk.)**	**Overall mean annual profit (Tk.)**
Small-50-150	24 (40)	85353	171504
Medium=151-251	14 (23)	164795	
Large=252-350	22 (37)	248053	

Note: Figures in parenthesis are percentages Source: Field survey 201

[7] আব্দুল্লাহ আল মামুন, "ভ্রাম্যমান হাঁসের খামারে সমৃদ্ধি"" দৈনিক কালের কণ্ঠ, তারিখ: ৭ মার্চ ২০১২, পৃ.১ ও ৮।

[8] M.A.A. Mahmud, Loc. cit.

3.3.7 Impact on Cost and Return

3.3.7.1 Cost of Duck Production

Cost of rural duck production is shown in Table 16. The average annual total cost for duck farms were Tk. 144838. The total variable cost and fixed cost for duck production were Tk. 128842 and Tk. 15996 which were 88.90 and 11.10 % of total cost respectively. The highest cost was found to be feed cost which was 63.65% of total cost. Labor cost was the second which was 16.91% of total cost. Haque et al. observe almost similar results on feed cost (68%-70%) and labor cost (15%).[9]

Table 16: Annual Gross Cost of Duck Farm (Mean flock size 211)

Cost item	**Cost**	
	Cost (Tk.)	% of total cost
A. Variable cost	**128842**	**88.90**
1. Duckling cost	6234	4.30
2. Duckling cost	92200	63.65
3. Veterinary cost	1505	1.00
4. Litter cost	2133	1.47
5. Labor cost	24500	16.91
6.Transportation	2270	1.57
B. Fixed cost	**15996**	**11.10**
7. Housing cost	2216	1.53
8. Equipments	1080	0.75
9. IOC	12700	8.81
Total cost: A+B	**144838**	**100.00**

Note: IOC= Interest on operating capital Source: Field survey 2012

3.3.7.2 Returns from Duck Farm

Data show that average gross return from duck farms (average flock size 211) were Tk. 316342 (Table 17). The sources of return were duck egg, spent duck and used litter. The major return comes from duck egg (79.66%) followed by spent duck (19.66%) and used litter (0.67%).

Table 17: Annual Gross Return per Duck Farm

Selling item	**Unit**	**Unit price (Tk.)**	**Quantity**	**Total value (Tk.)**	**% of total return**
a. Egg	No.	6.56	38400	252000	79.66
b. Spent duck	Kg	151.90	409.47	62200	19.66
c. Used litter	Sac	50.00	42.84	2142	0.67
Total value (Tk.)				316342	100

Source: Field survey 2012

[9] Haque et al. "Duck Production in the Sylhet Basin of Bangladesh: Prospects and Problems", Proceedings of World Poultry Science Association, 2nd International Poultry Show and Seminar, 16-17 February, 2001, pp.40-51.

3.3.7.3 Gross Margin, Net Return and Cost-benefit Ratio

Table 18 shows the gross margin, net return and cost benefit ratio of rural duck farming. The gross return, gross margin and net return from duck farming were Tk. 316342, Tk 187500, Tk. and Tk. 171504 respectively. Khanum, Chawlibog and Haque(2005) observe somewhat different results on net income.[10] They show that a duck farmer can earn Tk. 123405 per year from duck farming. In a separate study Haque and Sultana (2003) also get somewhat different findings that a farmer with 200 layer ducks with or without hatchery can make annual net return of Tk. 116722 and Tk. 55353 respectively. This might be due to the fact that their study was conducted in 2005 and 2003 when price of egg and meat was comparatively lower than that of present time. The cost benefit ratio on variable cost and total cost basis were 2.45 and 2.18 respectively.[11]

Table 18: Annual Gross Margin, Net Return and Cost-benefit Ratio of Duck Farm

Particulars	Cost and return (Tk.)
A Total variable cost (Tk.)	128842
B. Total Cost (Tk.)	144838
C. Gross return (Tk.)	316342
D. Gross margin (Tk.)(C-A)	187500
E. Net return (Tk.)(C-B)	171504
F. Return per taka invested (variable cost basis) C/A	2.45
F. Return per taka invested (total cost basis) C/B	2.18

3.3.8 Utilization Pattern of Duck Products

The collected data regarding utilization pattern of duck products is shown in Table 19. It was found that duck farm families consumed 5.77 kg meat and 249(no.) eggs annually which were 1.38% and 0.70% respectively of total their total production. Findings also indicate that respondent farm families distributed 1.48 kg meat and 46(no.) eggs to their relatives annually which were 0.35% and 0.13% of total production. Major portion of the produced meat and egg were sold to duck traders and egg traders from farm gate which accounted for about 98.27% and 99.17% respectively.

[10] J.Khanum, A. Chawlibog and K.S. Haque, "Study on Rural Duck Production Systems in Selected Areas of Bangladesh", Livestock Research for Rural Development, Volume 17(10)(2005), pp.1-8. .(www.irrd.org/irrd17/10/khan17113.htm, accessed on 24 February 2012).

[11] K.S. Haque and N. Sultana, "Organic Duck Farming in Bangladesh and Entrepreneurship Development", Proceedings of World Poultry Science Association, 3rd International Poultry Show and Seminar,2003, pp.279-287.

Table 19: Production and utilization pattern of duck products per farm

Duck products	Utilization of duck products per year			Total production/year
	Family consumption	Distribution to relatives	Sale	
Spent duck (Kg)	5.77 (1.38)	1.48 (0.35)	409.47 (98.27)	416.72 (100)
Egg (No.)	249 (0.70)	46 (0.13)	32914 (99.17)	33209 (100)

Note: Figures in parenthesis are percentages of total production
Source: Field survey 2012

3.4 Problems in Duck Farming and Suggestions for their Solutions

3.4.1 Problems Faced by Duck Farmers

The participant duck farmers were asked to give weight on 10 selected problems depending on their intensity (low=1, medium=2 and high=3). Final rank order of the selected problems was done based on total weighted score of each problem. Total score was determined by the formula followed by Mozumdar *et al.*[12] Final rank order of the selected problems is shown in Table 20.

Total score=Number of respondents× Intensity of problem (High+Medium+ Low)

$$= n^3\times3+ n^2\times2+ n^1\times1$$

Where, n3, n2 and n1=Number of respondents giving high (3), medium (2) low weight (1) respectively.

On the basis of total weighted score these problems were finally ranked as, 1st, 2nd, 3rd, 4th etc. problem respectively out of 10. Lower price of duck egg and meat (1st problem), higher price of feed (2nd problem) and price fluctuation of duck egg (3rd problem) were found to be the three main problems in duck farming in the study area. Most of the farmers (85%) opine that lower price of duck products (meat and egg) greatly affect profit margin from duck farming and they ranked this problem as 1st out of 10 selected problems. About 77% and 75% farmers identify that higher price of feed and price fluctuation of duck egg were also very serious problem for their business. Lack of sufficient capital, lack of training, irregular supply of duckling, inadequate veterinary service, problem of theft, outbreak of disease and pollution of environment were

[12] L. Mozumdar et al., "Broiler Farming: An Approach to Improve Rural Livelihood", Journal of Bangladesh Agricultural University, Volume 7(2) (2009), pp. 395-402.

[13] B.C. Roy, "Identification of Constraints of Raising Broiler of Small Flock Size and Determination of their Remadial Measures", (Mymensingh: M.S. Thesis, Department of Poultry Science, Bangladesh Agricultural University, 2000), pp. 34-50.

other important problems which were ranked as 4th, 5th, 6th, 7th, 8th, 9th and 10th problems out of 10. Though it is observed that outbreak of disease is a vital problem in poultry sector especially in chicken farming[13] but duck farmers of the study area ranked it as a less serious problem (9th), because ducks are more resistant to poultry diseases. Mahmud also reports that lower price of duck meat and egg, lack of credit, scarcity of feed in dry season, lack of proper treatment and medicine etc. were serious problem in duck farming in Haor region of Bangladesh.[14]

Table 20: Problems Faced by Poultry Farmers

Problems	Intensity of problems			Total score	Rank order
	High (3)	Medium (2)	Low (1)		
1.Lack of sufficient capital	33 (55)	27 (45)	00 (00)	153	4th
2.High price of feed	46 (77)	8 (13)	6 (10)	160	2nd
3.Low price of duck egg and meat	54 (85)	6 (15)	00 (00)	174	1st
4.Outbreak of disease	17 (28)	28 (47)	15 (25)	122	9th
5.Inadequate veterinary services	34 (56)	16 (27)	10 (17)	144	7th
6. Lack of training	40 (67)	12 (20)	8 (13)	152	5th
7. Irregular supply of duckling	33 (55)	23 (38)	4 (7)	149	6th
8.Price fluctuation of duck egg	45 (75)	9(15)	6 (10)	159	3rd
9.Problem of theft	18 (30)	30 (50)	12 (20)	126	8th
10. Pollution of environment	10 (17)	12 (20)	38 (63)	92	10th

Note: Figures in parenthesis are percentages, Source: Field survey 2012

3.4.2 Suggestions for Solving the Problems

To overcome the problems and constraints in duck farming and to make this business more profitable in the study area some suggestions were made based on the comments passed by respondent farmers, duck related businessmen and livestock experts. The suggestions were:

1) To reduce feed price,
2) Regular supply of ducklings
3) Sufficient credit supply,
4) Ensuring veterinary services,
5) Prevention and control of diseases,
6) Arranging regular training for the farmers,
7) Maintaining stability in the market price,
8) Production of feed ingredient in Bangladesh and
9) Following good management practices in duck production.

[14] M.A.A. Mahmud, Loc.cit.

5.0 Conclusion

Duck farming is a promising sector in Bangladesh. A tremendous growth of duck population, number of duck farms, production and consumption of meat and egg, employment generation, investment in commercial duck farms have been occurred in this sector in last 20 years. The present study has clearly shown that family nutrition, housing condition, drinking water, sanitation, healthcare services, clothing condition, educational capability, household asset and awareness of the respondent farm families were increased significantly ($p<0.01$ and $p<0.05$). After introducing duck farming annual income, expenditure, savings, employment generation, utilization of family labor, and utilization of duck products were increased. As a result, the overall socio-economic status was increased significantly ($p<0.01$). There are various problems in duck farming those hinder profitability of this sector. If initiatives both from government and non-government sector are taken to solve those problems then duck farming will really be a profitable business in Bangladesh.

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