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Article

Present status, problem and prospect of duck farming in rural areas of Mymensingh district, Bangladesh

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Abstract: The study was conducted to know the present status, existing production system of duck and assess the potentiality of duck rearing in rural areas of Mymensingh district in Bangladesh. Data were collected randomly from 50 duck rearing farmers using a pre-tested interview schedule during March to May 2010 from several villages under sadar upazilla of Mymensingh. The results reveal that most of the farmers (60%) were middle aged. About 32% farmers were illiterate. Most of the farmers (52%) reared *deshi* duck and duck population per household was 11.1. About 80% wife of farmer's household were responsible for duck rearing. All farmers reared duck in semi scavenging system. About 36% farmers used wood and tin for construction of duck house and 94% farmers used bedding materials for their duck house. All farmers used rice in the diet for duck and 62% farmers accumulated rice and rice polish to make diet for their ducks. About 40% farmers provided on an average of 121.91g supplemental diet to each duck/day and cost of the diet was Tk. 0.85/duck/day. Most of the farmers (72%) provided diet to their ducks twice a day. The age and weight of duck at maturity were 183.6 days and 1.69 kg, respectively. Egg production/duck/year and weight of each egg were 117.5 no's and 63.8g, respectively. All farmers incubated duck egg under broody hen and they got 85.83% hatchability on set eggs. Most of the farmers (52%) mentioned that most prevalent disease of duck was cholera and their duck mortality was 15.2%. About 52% farmers controlled their duck disease with medication and only 14% farmers used vaccine to prevent duck disease. About 22% and 13.5% people did not consume duck meat and egg, respectively because of odour, asthama and allergy. Most of the farmers (50%) incubating duck eggs for ducklings. About 66% farmers purchased duckling by Tk. 24-25 and 58% farmers sell adult duck by Tk. 175-190. Most of the farmers (81.25%) stated that the duck farming is decreasing day by day. About farmers (51%) stated that reason of decreasing duck farming was lack of scavenging area. It was concluded that duck rearing knowledge of the farmers such as breeding, feeding, housing, prevention and control of diseases are not satisfactory of this areas. Introducing of improved duck breeds/varieties, training to duck farmers, ensuring vaccination to ducks, financial and technical support to the farmers could increase the duck rearing with increased household income and employment to youth, rural women and the small-holder marginal farmers.

Keywords: present status; duck farming; semi-scavenging system; Mymensingh

1. Introduction

Bangladesh is an agricultural country. Poultry plays a significant role in the subsistence economy of the country and contribute 1.6% in GDP (SAEDF, 2008). Among the poultry species, duck ranks 2nd just after chicken in producing poultry meat and eggs. DLS has given an estimation of duck population of 37.2, 38.70, 39.08 and 39.84 million for the year of 2005, 2006, 2007 and 2008 respectively, while FAO given population of duck in

2005, 2006, 2007 and 2008 as 20, 21, 22 and 23 million, respectively. At present, prices of meat and eggs are beyond the buying capacity of the poor people. Increased ducks egg and meat production can play a vital role in solving these problems. 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. Small scale duck farming has not only been proved to be a beneficial occupation for small, marginal and landless farmers, but also a potential source of self-employment for the youth and distress women (Jabber, 2004). There are many advantages of duck production and the duck can be considered as a good all purpose poultry species. Duck needs less care and management. Ducks can exploit natural water bodies; marshy lands, haors, rivers, ponds and cannels for their individual gain. About one-ninth of the total land of Bangladesh is low land which is very much suitable for duck rearing. It is easy to raise, need less space for rearing and require low inputs of feed, housing facilities and management. Ducks are hardy and can easily adapt to different climates and they are also relatively resistance to diseases (Holderread, 1990). Ducks are excellent foragers and if allowed to scavenge, can consume enough natural feed to cover most of their nutrient requirements. The scavenging venues of duck and chicken are different. So, they are not competitor of each other for scavengable feeds. Duck offers the opportunity for better utilization of water and aquatic resources to generate food and income for rural communities. Poor villagers can get maximum return by giving minimum supplemental diets to their ducks. The prospect of duck rearing in Mymensingh district of Bangladesh lies in the fact that there are large areas of low-lying water reservoirs where waters stand throughout the year. These water reservoirs contain weeds, fishes, snails, insects, fallen grains etc, which are the important feeds for ducks when reared under scavenging and semi scavenging systems. There is a great potentiality in improving the productivity of duck through better feeding and management. The problem and prospect of duck rearing has not been yet assessed and quantified. Very few research works had been done on the potentiality, productivity and profitability of duck rearing. To increase the productivity of duck, the present status, problems and prospects are needed to be assessed for economic rearing of duck in Bangladesh. Therefore, the present experiment was undertaken to know the present status and existing production system of duck and assess the problems and prospects of duck rearing in the rural reas of Mymensingh district.

2. Materials and Methods

Several villages (Sohila, Bosra, Doribabakholi, Paglabazar, Mirzapur, Bagunbari, Char-nirikkha) under Sadar upazila of Mymensingh district and fifty farmers were selected from these villages purposefully and randomly. The selected farmers were considered on the basis of their traditional crop production combined with small-scale duck production system. The data were collected by interviewing with a fill up questionnaires on farmers knowledge regarding of duck rearing during March to May 2010. Some parameters like feed weight, egg weight and body weight were recorded directly by the researchers. Collected data were analyzed in accordance with the objectives of the study. Mean, standard deviation chi- test and percentage were used mainly to illustrate the results.

3. Results and Discussion

3.1. Farmer's personal information

3.1.1. Age of duck farmers

Age of the duck farmers ranged from 25 to 90 years. The farmers were stratified into 3 age categories; namely young <36, middle age 36-50 and old >50 (Table 1). The average age of duck farmers was 42.02. The stratification agrees with Rahman (2009). He observed the average age of duck farmers was 43.52 years.

3.1.2. Education of duck farmers

Level of education is an important indicator for duck farming. Score was given on the basis of year of schooling and one score was given for each year of schooling. Their score of education ranged from 0 to 15, which indicates that their education level was illiterate to graduation. In the study area, it was showed that 32% farmers were illiterate followed by 36% had primary education and rest 32% had schooling after primary education (Table 1).

This observation agree with Rahman *et al*. (2009) who reported that 39% farmers were from middle-aged category and 30% farmers have got primary level of education, 18% had secondary and 9% had higher education in Noakhali and Lakshmipur districts.

3.1.3. Duck rearing experience of farmers

Duck rearing experience indicates the proper management knowledge of duck farmers. The duck farmers were classified into 3 categories; namely shorter (<10 years), moderate (10-20 years), and longer (>20 years). The experience ranged from 3 to 60 years with average of 13.88 years (Table 1).

Table 1. Farmer's personal information.

Characteristics	Category	Farmer (%)	Mean	SD
Age (Year)	Young (<36 years)	24	42.02	11.05
	Middle age (36-50 years)	60		
	Old (>50 years)	16		
Education (Year of schooling)	Illiterate (score 0)	32	5.02	4.16
	Primary (score 1-5)	36		
	More than above (score >5)	32		
Rearing experience (Year)	Shorter (<10 years)	40	13.9	11.30
	Moderate (10-20 years)	40		
	Longer (>20 years)	20		

* SD, standard deviation

3.2. Rearing of duck

In the rural areas of Mymensingh district, farmers reared Deshi, Khaki Campbell, Jinding and Cross bred of ducks (Figure 1). Figure shows that about 52% farmers reared only Deshi, followed by 18% farmers reared only Khaki Campbell, 10% farmers reared only Jinding.

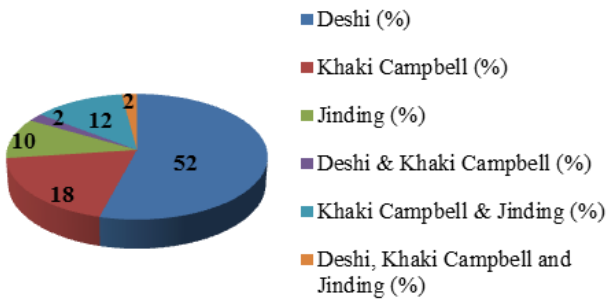

Figure 1. Duck Breeds.

The proportion of farmers reared *deshi* duck in this study was lower than that of Rahman (2009). He found 82.25% farmers reared *deshi* duck. The reason for decreasing of *deshi* duck may be for substitution of *deshi* duck by Khaki Campbell and Jinding.

3.3. Population of duck

According to flock size of duck, the farmers were classified into three categories; namely low producer having less than 5 no's; medium producer having 6 to 12 no's and high producer having 13-69 no's of duck. The number of duck reared by each farmer ranged from 3 to 69 with an average of 11.1 (Table 2).

Table 2. Population of duck.

Category (flock size)	Farmer (%)	Mean	SD
Small (3-5)	24	11.1	10.94
Medium (6-12)	48		
Large (13-69)	28		

*SD, standard deviation

From the Table 2, it can be seen that about 48% farmers were medium producers than low and high producers. The duck number per household agrees with that of Rahman (2009). He reported number of duck per household was 10.41.

3.4. Member involved in duck rearing

In taking care and management of duck, wife, son and daughter of the farmer were responsible (Table 3). Table shows that 80% of wife of farmers' household were responsible to take care of ducks rather than son, daughter and others.

Table 3. Member involved in duck rearing.

Member Involved	Household (%)	$\chi 2$
Wife	80	
Son	02	
Mother	02	145.9**
Wife and daughter	10	
Son and daughter	04	
Employed labour	02	

**, P<0.01

The finding is similar to the observation of Rahman (2009). He reported that 100% housewife was responsible to take care of duck. It may be concluded that traditionally women were the sole raiser of duck under rural condition.

3.5. Duck rearing system

All the farmers in the study area reared duck in semi scavenging system. The observation did not agree with Amin (1999). He reported that 85 to 87% duck was being reared under scavenging system.

3.6. Housing of duck

Farmer used a variety of materials for duck housing (Figure 2). Figure show that about 36% farmers used wood and tin followed by 22% farmers used brick, 22% farmers used bamboo and soil, 10% farmers used only bamboo and rest of the farmers used other materials for constructing duck house.

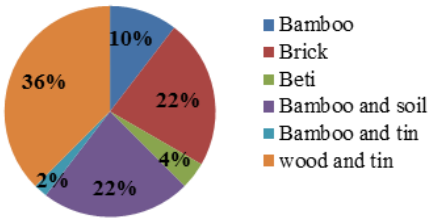

Figure 2. Housing materials of duck.

This finding differs from Rahman (2009). He found 65.5% farmers used wood and tin, 17.5% farmers used bamboo, 10.25% farmers used straw and bamboo and rest 6.75% farmers used soil and other materials for duck housing.

3.7 Bedding materials for duck

Variation of bedding materials in duck house was observed. It was shown that 94% farmers used bedding materials and rest 6% farmers did not use any bedding materials in duck house (Figure 3). Figure shows that about 42% farmers used sand as bedding materials, followed by 28% farmers used sand and ash, 8% farmers used ash, 8% farmers used paper and rest of the farmers used curtain, ash and paper in duck house.

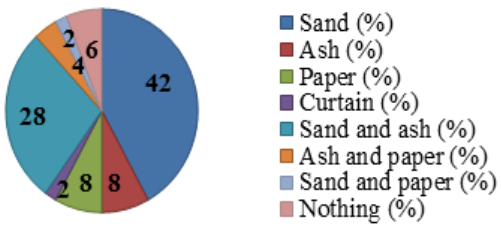

Figure 3. Bedding materials used in duck house.

3.8. Feeds and Feeding of duck

Farmers used a wide variety of supplementary feed for their ducks. It was shown that about 62% farmers used rice and rice polish, 20% farmers used rice, rice polish and commercial feed 6% farmers used rice, rice polish and paddy, 6% farmers used rice, rice polish and broken rice and rest of the farmers used rice, rice polish , snail and wheat bran as a feed ingredients for duck (Table 4).

Table 4. Feed ingredient in supplemented diet of ducks.

Feed ingredient	Farmer (%)	$\chi 2$
Rice and rice polish	62	
Rice, rice polish and paddy	06	
Rice, rice polish and broken rice	06	80.1^{**}
Rice, rice polish and commercial feed	20	
Rice, rice polish and snail	02	
Rice, rice polish and wheat bran	04	

**, P<0.01

It is evident from the current findings that 100% duck farmers used rice in the diet of duck which contradict Rahman (2009). He did not find any farmer to use rice in the supplemented diet.

3.9. Amount of feed supplied to duck and cost of supplemented feed

The amount of feed supplied to duck ranged from 100g/day to 142.8g/day with an average 121.91g/day. On the basis of feed supplied to duck farmers were classified into 3 categories; namely low, medium and high (Table 5). Table shows that 40% supplied 115-125g/day.

Table 5. Amount of feed supplied to duck/day and cost of supplemented feed.

Parameters	Category	Farmer (%)	Mean (g)	SD
Supplemented feed	Low (<115g)	20	121.91	9.28
	Medium (115-125g)	40		
	High (>125g)	40		
Feed price	Low (<0.6Tk.)	24	0.85	0.37
	Medium (0.6-0.75Tk.)	62		
	High (>0.75Tk.)	14		

* SD, standard deviation

The cost of supplemented diet of duck was lower. The cost of diet/duck/day ranged from Tk. 0.49 to 1.83 with an average of Tk. 0.85 (Table 5). The farmers were classified into three categories; namely low, medium and high (Table 5). Table shows that 62% farmers used a diet of Tk. 0.6-0.75 for each duck/day.

It is evident from Table 5 that the amount of supplemental feed/day of each duck 121.91g agrees the observation of Hoque *et al.* (2001). They observed that the farmers of Sylhet basin supplied 117g extra feed per duck per day during dry period but according to Rahman (2009), farmers gave 120g supplemental feed/day to each duck. The price of supplemented diet was higher than that of Rahman (2009). He found the average feed cost for each duck Tk. 0.42.

3.10. Pattern of feeding

Feeding varied from 1 to 3 times with a mean of 2.2 (Figure 4). Most of the farmers supplied diet 2 times a day, where as 4% supplied only 1 time and rest 24% farmers supplied diet to their duck in 3 times a day.

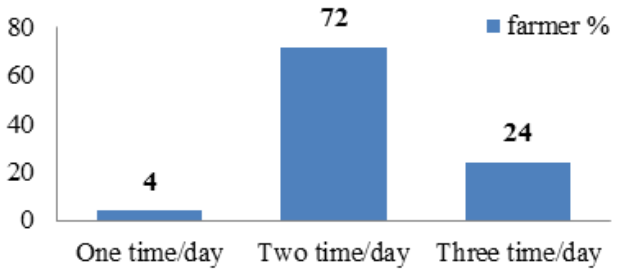

Figure 4. Feeding pattern.

3.11. Productivity of duck

The study was captured age at sexual maturity, adult body weight, egg production, egg weight and hatchability of duck as productivity parameters that presented in Table 6. Age at sexual maturity of duck varied from 180 to 210 days with an average of 183.6. Among the farmers 78% obtained first egg of duck at 180-189 days (Table 6). This observation agrees with Islam *et al.* (2003) and Sarker (2005). They stated that the age of sexual maturity of indigenous duck varied 180-210 days. Eswaran *et al.* (1984) observed age at first egg in 138 days for Khaki Campbell ducks vs 158 days for *Deshi* ducks. Weight of adult duck ranged from 1.4 to 2.0 kg with an average of 1.69 kg (Table 6). About 54% the farmers stated the weight of adult duck was 1.6 to 1.8kg (Table 6). The observed result agrees with Islam *et al.* (2003) and Sarker (2005). They stated the weight of adult indigenous duck 1.5 to 1.8kg. The observation is also similar to that of Hamid *et al.* (1988). They reported that the body weight at sexual maturity of Khaki Campbell and *Deshi* duck 1748 and 1731g respectively. This observation of weight of adult duck was higher than that of Das and Hoq (2000). They reported the body weight of Jinding 1.51kg at sexual maturity.

Egg production ranged 80-200/duck/year with an average number of 117.5 (Table 6). Among the farmers 48% found 80-100 egg/duck/year, 48% found 101-150 egg/duck/year (Table 6). The observation of egg production of duck was lower than that of Ukil (1992). He stated that indigenous ducks reared for egg and meat laid 150-200 eggs per year under semi-scavenging system but the observation was higher than that of Islam *et al.* (2003) and Sarker (2005). They stated the egg production of indigenous duck was 85-90. The weight of duck egg ranged 60-70g with an average of 63.8 g (Table 6). About 60% the farmers stated the weight of duck egg was 63 to 65 g (Table 6). The egg weight obtained coincides with that of Islam *et al.* (2003) and Sarker (2005). They reported the egg weight of indigenous duck was 65g. The hatchability percentage of duck egg ranged 77-91.6% with an average of 85.83 (Table 6). Most of the farmers (53.33%) obtained hatchability of duck egg were 84-88% (Table 6). Hatchability of duck eggs was higher than that of Alam and Hossain (1989). They reported that hatchability of duck egg ranged from 60 to 85%. The observation of hatchability was also higher than that of Rahman (2009) and Hamid *et al.* (1988). Rahman (2009) found 79% hatchability of duck egg. Hamid *et al.* (1988) reported the hatchability (%) of *Deshi* ducks was 66%.

Table 6. Productivity of duck.

Parameters	Category	Farmer (%)	Mean	SD
Sexual maturity	Early (<190 days)	78	183.6	7.15
	Moderate (190-200 d)	20		
	Late (>200 days)	02		
Adult weight	Low (<1.6kg)	36	1.69	0.155
	Medium (1.6-1.8kg)	54		
	High (>1.8kg)	10		
Egg production	Low (80-100)	48	117.5	28.90
	Medium (101-150)	48		
	High (150-200)	4		
Egg weight	Low (<63g)	32	63.8	2.95
	Medium (63-65g)	60		
	High (>65g)	8		
Hatchability (%)	Low (<84%)	33.33	85.8	2.72
	Medium (84-88%)	53.33		
	High (>88%)	13.33		

*SD, standard deviation

3.12. Reason of Incubation of duck egg under hen

All farmers incubated their duck egg under broody hen. They stated different reasons of incubation of duck egg under broody hen (Table 7). Table shows that about 20% farmers stated that hen to be more broody than duck, 18% farmers stated hen as a good mother, 16% farmers stated that as duck lay more eggs they used hen to minimize the loss of egg production.

Table 7. Reason of incubation under chicken.

Reason	Farmer (%)	$\chi 2$
More broody	20	8.8^{NS}
Good mother	18	
More broody and good mother	12	
Scavenge near house	12	
Stop egg production	16	
More hatchability	10	
GM and more sitting time	02	
Unknown	10	

NS, P>0.05

3.13. Diseases of duck

It was observed that most prevalent diseases of duck were Plague and Cholera. About 52% farmers stated that their duck were affected with Cholera, 26% duck were affected with Plague and rest 8% farmers did not faced any duck diseases (Table 8).

Table 8. Important diseases of duck.

Disease	Farmer (%)	$\chi 2$
Duck cholera	52	39.8^{**}
Duck plague	26	
Limber neck poisoning	12	
Avian influenza	02	
No disease	08	

**, P<0.01

This finding coincides with that of Rahman (2009) and Baki *et al.* (1986). Rahman (2009) found that 100% of the duck owners in Noakhali Sadar and Ramgati reported that the most prevalent diseases of ducks were Plague and Cholera. Baki *et al.* (1986) mentioned that Duck Plague and Duck Cholera are the common diseases of epidemic nature in Bangladesh.

3.14. Mortality of duck

Mortality of duck ranged 0-35% with an average of 15.2% Farmers were categorized into three groups; namely low (<10%), medium (10-20%) and high (>20%) (Table 9). Table shows that 70% farmers reported that their duck mortality was 10-20%.

Table 9. Mortality of duck.

Category	Farmer (%)	Mean (%)	SD
Low (<10%)	14	15.2	8.50
Medium (10-20%)	70		
High (>20%)	16		

*SD, standard deviation

The mortality rate in this observation is lower than that of Huque and Hussain (1994) and Khanum *et al.* (2005). Huque and Husain (1994) reported that the mortality of Khaki Campbell and *Deshi* duck were 58% and 72% respectively. Khanum *et al.* (2005) reported that the mortality of duck in Netrokona was 27.1%. The mortality was higher than that of Islam *et al.* (2003) and Sarker (2005). They reported that the mortality of indigenous growing duck was 6-9%.

3.15. Controlling procedure of duck diseases

Controlling procedure of duck diseases were varied among farmer to farmer. Most of the farmers (52%) controlled their duck disease with medication, only 14% farmers used vaccine to prevent duck disease and rest 12% did nothing for controlling diseases (Figure 5).

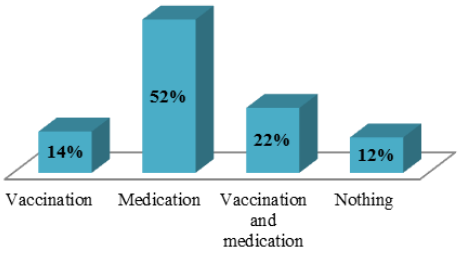

Figure 5. Control procedure of duck disease.

It is revealed from the study that 36% farmer vaccinated duck which was higher than that of Rahman (2009). He observed that only 14.5% farmers vaccinated duck.

3.16. Consumption pattern of duck meat and egg

A large number of populations did not consume duck meat and egg that was a limitation of duck rearing. About 22% population did not consume duck meat and 13.5% population did not consume duck egg (Figure 6).

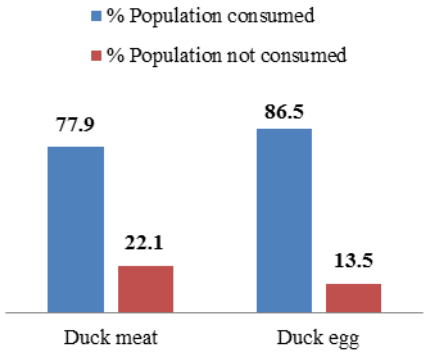

Figure 6. Consumption patterns of meat & egg.

3.17. Reason of not consuming duck meat and egg

Farmers did not consume duck meat and egg for odour, asthma, allergy and religious factor. About 62% and 45% farmers did not consume duck meat and egg for odour, respectively. About 30% and 45% farmers did not consume duck meat and egg for asthma, respectively (Table 10).

Table 10. Reason of not consuming duck meat and duck egg

Parameters	Reason	Farmer (%)	$\chi 2$
Duck meat	Odour	62	
	Asthma	30	45.7^{**}
	Allergy	06	
	Religious factor	02	
Duck egg	Odour	45	
	Asthma	45	24.5^{**}
	Allergy	10	

**, P<0.01

3.18. Source of duckling

Most of the farmers did not purchase duckling from anywhere. They incubated duck egg under broody hen to get duckling (Figure 7). Figure shown that farmers incubating eggs for ducklings were 50%, followed by 26% farmers purchased from market, 18% farmers purchased duckling from neighbour house and rest 6% farmers purchased from poultry farm (Figure 7).

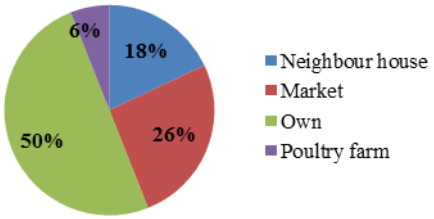

Figure 7. Source of duckling.

The observation is in agreement with Rithamber *et al.* (1986) and Ravindran *et al.* (1984). They indicated that for non-existence of duck hatcheries in study areas the farmers obtained ducklings by hatching fertile eggs under the broody hen.

3.19. Price of duckling and adult duck

The cost of duckling varied from Tk. 20 to Tk. 25 with an average of Tk. 23.4 (Table 11). Table shows that about 66% farmers purchased duckling by Tk. 24-25 and 34% farmers purchased duckling by Tk. 20-23. The price of adult duck varied from Tk. 150 to Tk. 210 with an average of Tk. 188.5 (Table 11). Table shown that about 58% farmers stated the price of adult duck was Tk. 175-190.

Table 11. Cost of duckling and adult duck (Tk. /duckling or duck).

Parameters	Category	Farmer (%)	Mean (Tk.)	SD
Duckling price	Low (20-23 Tk.)	34	23.4	2.30
	High (24-25 Tk.)	66		
Adult duck price	Low (<175 Tk.)	14		
	Medium (175-190 Tk.)	28	188.5	15.90
	High (>190 Tk.)	58		

*SD, standard deviation

3.20. Farmer's opinion about duck farming trend

Most of the farmers (81.25%) stated that the duck farming is decreasing and rest 18.75% stated that duck farming is increasing (Table 12).

Table 12. Farmer's opinion about duck farming trend.

Opinion	Farmer's response (%)	$\chi 2$
Increasing	18.75	37.8**
Decreasing	81.25	

**, P<0.01

3.21. Reason of decreasing duck farming

Duck farming were decreasing because of lack of scavenging area, own pond and complains of neighbor. About 51% farmers stated that duck farming was decreasing for lack of scavenging area, 13% farmers stated for decreasing duck farming was required own pond and remaining (36%) farmers stated for decreasing duck farming was complains of neighbor (Table 13).

Table 13. Reason of decreasing duck farming.

Reasons	Farmer's response (%)	$\chi 2$
Lack of scavenging area	51	22.0**
Required own pond	13	
Complains of neighbor	36	

**, P<0.01

3.22. Problems of duck farming

The farmers have limited knowledge about the production performance of improved breeds/varieties of duck. Farmers do not know scientific feeding and management system of duck. Most of the farmers do not know about vaccination and its advantages in preventing duck disease. They have unavailability of improved variety of duckling. Most of the farmers have no training on duck production. Decreasing scavenging area and complains of neighbor regarding decrease duck rearing because they damage seedlings and crop during scavenging.

3.23. Prospects of duck farming

Duck farming is profitable because less investment is required. Better utilization of feed resources under water and wastage feed materials. More eggs obtained from duck than chicken. Most of the land of Bangladesh is low land which is very much suitable for duck rearing. Duck farming create employment opportunities among rural people especially for the unemployed youth, rural women.

3.24. Recommendations to improve duck farming

a) For increasing duck meat and egg production it is needed to Introduce improved duck varieties in the rural areas with informing the farmers about the advantages of rearing improved varieties. The farmers can even use improved *deshi* duck like *deshi* black and *deshi* white.
b) Training is necessary to all duck farmers for better feeding and management of duck to get better production.
c) Vaccination against common diseases of duck should be ensured.
d) Good quality of duckling should be supplied to the farmers. Vaccine and medicine of duck should be available in market.
e) Government should give financial and technical support to farmers for rearing duck.
f) Duck rearing in the rural areas of Bangladesh could be a good source of income, nutrition and employment generation, especially for the unemployed youth, rural women and the small-marginal farmers.

4. Conclusions

The study concluded that most of the farmers reared deshi duck. Duck rearing knowledge such as breeding, feeding, housing, prevention and control of diseases are not satisfactory of the farmers. Therefore, a need-based extension program should be introduced among the farmers giving more focus on building awareness and ability about duck production.

Conflict of interest

None to declare.

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