

Article

Socio-economic condition and indigenous poultry production scenario in a selected cluster area of Bangladesh

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Abstract: A baseline survey was conducted in a cluster area (279 households) of Mymensingh district in Bangladesh to know the farmers' socio-economic condition, and overall production and husbandry practices regarding indigenous poultry farming and assess future outlook. Data were analyzed following descriptive statistics. Most of the farmers (54.84%) were in middle age type (31-50 years) and landless (41.58%). The average annual income of farmers recorded 61,260 BDT or 875 USD where agriculture (49.10%) was found as primary occupation. The average indigenous chicken (196 HHs), duck (16 HHs) and pigeon (4 HHs) distribution per household were 5.62, 3.81 and 3, respectively. Average egg production per clutch in chicken and duck identified 13.47 and 17.50 eggs, respectively, with 76.78 and 69.61% hatchability. Indigenous poultry (60.20%) housed inside the dwelling of farmers. Natural and uncontrolled breeding observed for all indigenous livestock in the studied area. Vaccination practice followed very limited for poultry while Newcastle disease found most prominent in poultry (65.82%). Proper initiative, funding, farm-based training to educated farmers including modern animal husbandry practices could increase indigenous poultry population and consequent profit.

Keywords: chicken; duck; pigeon; management

1. Introduction

The livestock farming of Bangladesh contributing 12% of the agricultural GDP (Karim *et al.*, 2010) and is projected to increase 19.9% in 2020 (Hossain and Bose, 2000). National statistics revealed the population of chicken and duck, respectively, 228.03 and 42.68 million in Bangladesh (BBS, 2010).

Indigenous chicken and duck of free range provide 75.06% eggs and 86.05% meat (Huque *et al.*, 1999), although their flock size (below 20) and performance (up to 1.50 kg meat and 35-40 eggs annually) are limited (Das *et al.*, 2008). Besides chicken and duck, another local poultry species, pigeon usually reared in both rural and urban area as a sign of peace, beautification and ornaments, although their contribution not yet consider as alternative source of animal protein in Bangladesh (Asaduzzaman *et al.*, 2009). Duck (Modak, 1996) and pigeon are more disease resistance and need comparatively less care during brooding and rearing than chicken, moreover they do not interfere with chicken scavenging areas (Ferdus, 1999). Poultry production in scavenging system is facing various problems including housing, feeding, diseases, lack of knowledge of rural farmers regarding quality of feed, disease prevention and control techniques (Billah *et al.*, 2013) where indigenous ruminants are facing similar difficulties like poultry regarding management and disease control issues especially in rural area of Bangladesh.

Vary limited research works have been performed on socio-economic status of indigenous poultry farmers including overall production and management system. Therefore this study was planned to clarify the said issues including possible prospect from a sample cluster area of Bangladesh.

2. Materials and Methods

A baseline survey was conducted on 279 households (HHs) with a pre-tested survey questionnaire in a selected cluster area named Bakda Akanda Para of Fulbaria sub-district belongs to Mymensingh district of Bangladesh on August, 2010. Households were selected randomly in that area and interviewed by an expert enumerator team of Bangladesh Agricultural University composed of 12 post-graduates. Data were compiled, tabulated, and analyzed using descriptive statistic by SPSS version 16 (SPSS Inc. Chicago, USA).

3. Results and Discussion

3.1. Socio-economic condition of the livestock owners

The socio-economic status of farmers in surveyed area is shown in Table 1. The middle aged people (54.84%) observed highest in studied area. The illiterate rate found about 67% where literate farmers mainly got primary (17%) and secondary (14%) schooling. Nearly half of the people (42%) were landless and average cultivable land for each household was 48.30 ± 5.57 decimals which also indicating social status of farmers. Average farming experiences recorded 18.75 ± 1.06 years in the farmers of studied area including 29.39% of 16-30 years' experience. Maximum 54.48% farmers earned 41,000-80,000 BDT annually with an average $61,260 \pm 1,800$ BTD. Agriculture (49%) was the primary occupation (Figure 1) in that rural area followed by day or agri-labour (17%) and van puller (11%). Approximately 70% people did not engage with secondary occupation (Figure 1) but 14% farmers observed to involve with agricultural as secondary occupation. Although 82% farmers were livestock owner, only 3% received agricultural training from GO or NGOs (data not shown). These results suggesting that the socio-economic condition of the studied areas was very poor in terms of land ownership, education, occupation and annual income.

From the report of BBS (2009) about 25-30% households of Bangladesh belongs to landless category or have less than 5 decimals of land, and 80% considered as small farmers. The experiment of Billah *et al.* (2009) found 44% middle aged farmers including an average annual income 47,060 BDT which was lower than our findings but they observed higher farm size (180 decimals) and literacy rate (62%) with an average five grade of schooling in poultry farmers of tow sub-districts of Gaibandha in Bangladesh. But the finding of Rahman *et al.* (2009) found 39% middle aged (36-50 years) farmers with 75.25% land ownership and 76.50% literacy rate which differed with our and previous findings including primary occupation which stated 61% on duck farmers in two southern coastal districts of Bangladesh. However, Sharmin *et al.* (2012) reported 86% primary occupation based on agriculture in the farmers of Mymensingh, Jamalpur and Sherpur districts. In addition, they stated primary (23%) and secondary (30%) education level of the farmers which were almost double than our findings. The study of Asaduzzaman *et al.* (2009) showed slightly similar results regarding literacy (46.70%) levels in Gouripur sub-district of Mymensingh where 37% literacy observed in our surveyed area, although average national literate rate stated 66% (BBS, 2009). Uddin *et al.* (2010) reported 55% literacy of the rural farmers with the monthly income range 1,000-5,000 BTD (1 USD was approximately 70 BDT at 2010) from a survey on Sylhet, Mymensingh and Noakhali districts where income range supported our findings. The study of Hai *et al.* (2008) on Fulbaria sub-district of Bangladesh identified 30% farmers who had enough knowledge on health and nutrition. Another study on 100 poultry farmers by Yasmin *et al.* (1989) observed only 13% farmers had good knowledge and 17% did not have sufficient knowledge on poultry feeding, breeding, housing, and disease prevention and control where our study showed much lower value regarding farming knowledge (3%) in the rural poultry owners. By rearing indigenous chicken a farmer could earn 384 BDT (about USD 5) annually from each bird after selling eggs, spent hen and manure (Dutta *et al.*, 2013). Huque and Sultana (2002) reported that a farmer could earn USD 1,945 or USD 922 annually from 200 layer ducks with or without rice husk hatchery, respectively, in scavenging system.

3.2. Description and use of livestock

The total poultry population observed in the surveyed area was indigenous type (Figure 2). Non-descript *deshi* chickens were common poultry species in that area followed by *deshi* duck and pigeon. Data of last six months (data not shown) regarding home consumption (n=371) and selling (n=555) of chicken revealed 50% and 39.40% households, respectively.

3.3. Flock composition and distribution of poultry species

The composition and distribution of available poultry species in surveyed area are summarized in Table 2. A total of 1,103 indigenous non-descript *deshi* chicken found which encompassing breeding cock (4.90), laying hen (16.41), broody hen (7.43), cockerel (7.16), pullet (12.33) and chick (51.31%). The cock to hen ratio (1:5) identified ideal for breeding aspect. Average chicken flock size (5.62 ± 0.35) found moderate including 51.31% chick (2.89 ± 0.30) followed by 16.41% laying hen (0.92 ± 0.08) and 12.33% pullet (0.69 ± 0.09). On the other hand, average flock size of duck (3.81 ± 0.56) identified lower than chicken encompassing 42.62% laying duck (1.63 ± 0.62) followed by 26.23% (1 ± 0.41) duck pullet and 8.20% breeding drake (0.31 ± 0.15). The drake to duck ratio (1:5) was similar with chicken. Total six pairs of *deshi* pigeon found in the studied area. Up to five chicken and duck observed in 59% chicken and 75% duck rearing farmers where six to ten birds recorded in 25% households of each group (Figure 3).

Sørensen (2010) and Bhuiyan *et al.* (2005) reported 5-6 and 6-7 indigenous chicken per flock, respectively, where national report stated 7-8 chickens (BBS, 2004). However, Kumar *et al.* (2013) and Guèye (1998) reported chicken flock number per household in India (6) and Sudan (5-10 chickens) which were in agreement with our findings. Sarker and Golam (2009) documented similar pullet (14) and chick (57%) with us but laying hen (21%) was higher. The national report of BBS (2007) on average duck number per flock (4.16) supported our finding. The study of Billah *et al.* (2013) observed 72% households who reared up to 10 chickens followed by 26% for 11-12 chickens. They also found 70% and 27% farmers for up to 10 and 11-20 ducks, respectively. Our findings showed comparatively higher percentage of households for the same number of chicken and duck population mentioned previously.

3.4. Production performance of poultry species

The average egg production (Table 3) of indigenous chicken identified lower (13.47 ± 0.23) than duck (17.50 ± 3.14). Annual clutch number also found lower in chicken (2.75 ± 0.05) than duck (2.83 ± 0.40). But the hatchability percentage showed little higher in indigenous chicken (76.78 ± 1.53) than duck (69.61 ± 1.43). A pair of *deshi* pigeon usually produced two squabs in each 1.50-2 months interval (data not shown).

Sarkar and Golam (2009) identified an average 14.60 eggs per clutch and 3.1 clutches per year in native chicken of Bangladesh which were in agreement with our findings and also the results of Tadelles (2003) in Ethiopia who stated 13.20 eggs per clutch and 2.20 clutches per year in Horro and Tilli chickens, respectively. Benabdeljelil *et al.* (2001) reported 13.50 eggs and 3 clutches in native chicken of Morocco. In Bangladeshi native chicken Jahan (2013) and Barua (1992) reported 73.42 and 75% hatchability, respectively which supported our findings. Hossary and Galal (1994) and Benabdeljelil *et al.* (2001) studied similar hatchability on Egyptian Fayoumi native hen (77-89 %) and Beldi chicken (71%) of Morocco, respectively. The annual egg production (60-91 eggs) of *deshi* duck studied by Salam and Bulbul (1983) and Huque and Ukil (1994) showed similarity with our results when considered together. Barua (1992) and Rahman *et al.* (2009) reported 56 and 79% hatchability, respectively on duck eggs in natural incubation where our result slightly varied from both of these findings. However, these results suggesting that the egg production performance of native chicken was inferior than duck which could be species differences and feed availability during scavenging. The lower hatchability of duck could be their distinct body shape and plumage size, although farmers mainly used hen to hatch duck eggs. Therefore egg fertility, seasonal variation of temperature and humidity, and egg handling procedures could affect the hatchability percentage of duck and chicken eggs but not similar to pigeon. Asaduzzaman *et al.* (2009) stated that annually 19.53 squabs produced from one pair of pigeon which supported the findings of Levi (1957) and with us. Kabir (2013) observed one pair of egg laying interval in pigeon about 37 days.

3.5. Overall management system of indigenous livestock

The overall management system in the studied area is presented in Table 4. Poultry species (except pigeon) usually kept inside the living room in coop (60.20%) while very limited was found outside the dwelling (9.18%) for chicken. Ready feed or feed ingredients purchasing was not a common practice for poultry owners. Natural and uncontrolled breeding observed for all poultry species in the surveyed area. Newcastle (65.82%) and fowl pox (29.59%) diseases identified dominantly in chicken population. Limited vaccination practice recorded in surveyed area for poultry (13.78%).

Sultana *et al.* (2012) found 80% households in a village of Netrokona kept their poultry inside dwelling to protect them from jungle cats, foxes and thieves, in addition, 87% households in Rajshahi who reared their poultry in separate case or night shed on veranda or a part of yard. Rahman *et al.* (2009) observed that 93.50% farmers kept duck in separate house of premises and 6.50% in side the dwelling. Moreover they found 38% farmers purchased feed (mainly rice polish) for their ducks and did not provide vaccine in two coastal areas of

Bangladesh. But Billah *et al.* (20013) identified 14% farmers followed vaccination to their poultry which was similar with our observation. Saleque and Mustafa (1996) claimed that the mortality rate of village poultry ranged between 35-85% due to disease and predators where Billah *et al.* (2013) reported 52-60% death for the attack of predators. Barman *et al.* (2010) identified a difference between Newcastle vaccinated (4.90%) and non-vaccinated (21.60%) rural chicken mortality in Mymensingh district, although only 11% of the total farmers followed vaccination. The overall poultry management system in our studied area showed consistent with the report of Guèye (1998) regarding feeding and breeding of village fowl in different African countries, in addition, he stated different disease incidence including Newcastle (61%), respiratory (14%), fowl pox (7%), pullorum/diarrhoea (7%) and fowl cholera (4%) in Nigeria.

Table 1. Socio-economic condition of the poultry owners.

Characteristic	Category	HH (n=279)	%	Mean±SE
Age (year)	Young age (16-30)	77	27.60	42.19±0.93
	Middle age (31-50)	153	54.84	
	Old (>50)	49	17.56	
Educational level of HH head (grade of schooling)	Illiterate (0)	186	66.67	2.18±0.21
	Primary (1-5)	47	16.85	
	Secondary (6-10)	40	14.34	
	Higher secondary (11-12)	4	1.43	
	Higher study (>12)	2	0.72	
Farm size (decimal)	Landless (>2)	116	41.58	48.30±5.57
	Marginal (2-20)	39	13.98	
	Small (21-100)	88	31.54	
	Medium (101-300)	27	9.68	
	High (>301)	9	3.23	
	Very high (>30)	52	18.64	
Farming experience (year)	No experience (0)	75	26.88	18.75±1.06
	Low (1-5)	9	3.23	
	Medium (6-15)	61	21.86	
	High (16-30)	82	29.39	
	Very high (>30)	52	18.64	
Annual income ('000 BDT)	Low (up to 40)	90	32.26	61.26±1.80
	Medium (41-80)	152	54.48	
	High (>80)	37	13.26	

Table 2. Flock composition of indigenous poultry species.

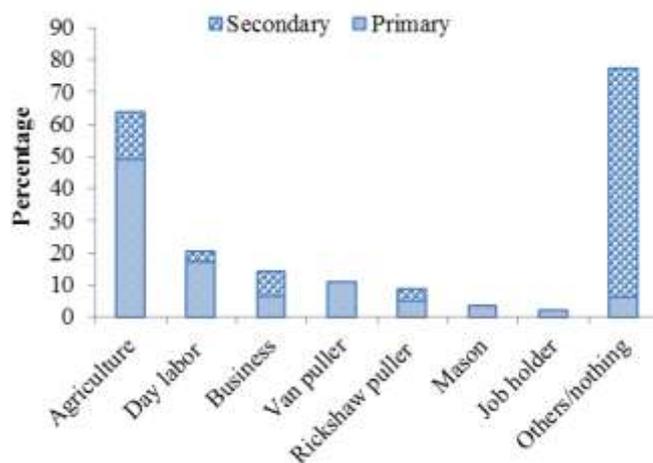
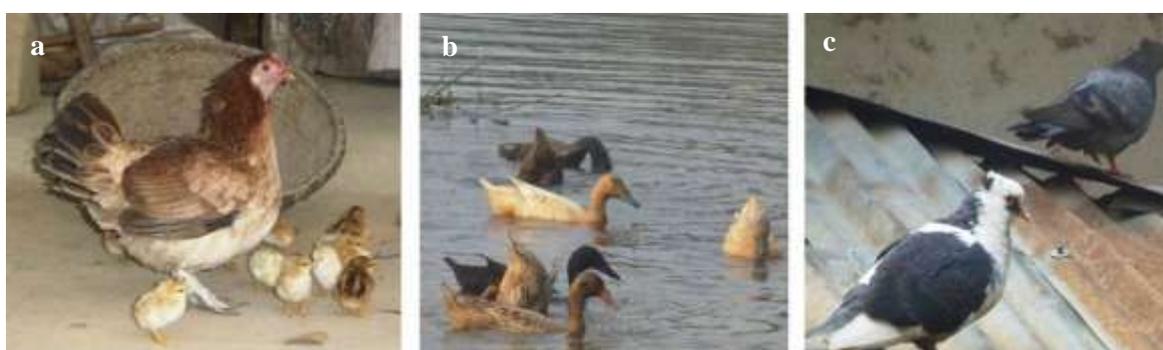
Types	Chicken (HHs=196)			Duck (HHs=16)				
	n	Range Min.-max.	%	Per flock (Mean±SE)	n	Range Min.-max.	%	Per flock (Mean±SE)
Cock / Drake	54	0-5	4.90	0.28±0.05	5	0-2	8.20	0.31±0.15
Laying hen / Duck	181	0-4	16.41	0.92±0.08	26	0-8	42.62	1.63±0.62
Broody hen / Duck	82	0-4	7.43	0.42±0.05	0	0	0	0
Cockerel	79	0-6	7.16	0.40±0.08	0	0	0	0
Pullet	136	0-6	12.33	0.69±0.09	16	0-6	26.23	1±0.41
Chick / Duckling	566	0-27	51.31	2.89±0.30	14	0-6	22.95	0.88±0.48
Total	1103	1-32	100	5.62±0.35	61	1-8	100	3.81±0.56

Table 3. Production performance (Mean±SE) of indigenous poultry species.

Species	n	Egg/clutch	Clutch/year	Hatchability (%)
Chicken (<i>Deshi</i>)	167	13.47±0.23	2.75±0.05	76.78±1.53
Duck	6	17.50±3.14	2.83±0.40	69.61±1.43

Table 4. Different management system of indigenous poultry.

Management system	Category	Poultry	
		HH (n=196)	%
Housing	Inside the dwelling in coop	118	60.20
	Inside the dwelling without coop	59	30.10
	Outside the dwelling (in coop)	18	9.18
	Kitchen	1	0.51
	Others	0	0
Feeding	Purchased feed / feed ingredients	0	0
Breeding	Natural and uncontrolled	196	100
Disease	Newcastle	129	65.82
	Fowl pox	58	29.59
	Fowl cholera	7	3.57
	Others (Diarrhoea, fever, worm)	1	0.51
Vaccination	Followed vaccination	27	13.78
	Not followed	169	86.22

**Figure 1. Primary and secondary occupations of the farmers.****Figure 2. Indigenous non-descript deshi livestock species: (a) Common deshi chicken, (b) duck and (c) pigeon.**

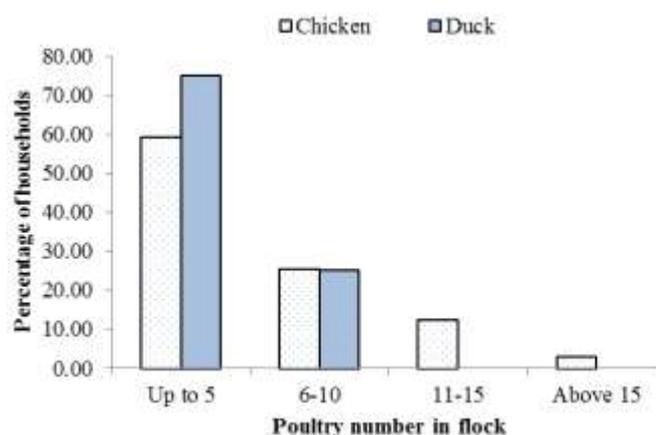


Figure 3. Distribution of poultry flocks among households.

4. Conclusions

A sample study from an area revealed that still now most of the indigenous poultry owners below the poverty levels regarding socio-economic and livestock farming. It could be the deficiency of their farm land, educational qualification, occupation, and farming knowledge. But personal, private or governmental initiatives could increase the indigenous poultry production in respective farmer's situation; in addition, traditional animal husbandry practices could switch to modern affordable techniques. Therefore at least secondary level of education and agricultural training on specific field are recommended to all households' head, otherwise all attempts would be non-profitable or aimless. GOs and NGOs are highly encouraged to facilitate and ensure easy funding, agricultural training and vaccination or medication to the rural and urban farmers more especially those who want to increase livestock as a commercial aspect. To execute these visions media could play a vital role beside root level agricultural extension programmes.

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Conflict of interest

None to declare.

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