



Common Peafowl (*Pavo cristatus*) Farming in Bangladesh: Current Status, Reproductive Behavior and Health Management

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Abstract

The research was carried out in a few selected regions of Bangladesh from July 2022 to June 2023 to explore the current status, reproductive behavior, and health management of captive common peafowl (*Pavo cristatus*). Ten peafowl farmers were interviewed using pre-structured questionnaire to collect primary data. The data were processed, and then illustrated in tabular form employing descriptive statistical analyses. The majority of the farmers were aged between 31 to 50 years, with 50% engaged in business. They became interested in peafowl farming through social media, other farmers, and friends. Notably, most of the farmers reared India Blue variety of common peafowl. They had neither prior experience nor participated in any training programs on peafowl farming. The adult male peafowl (peacock) significantly ($P<0.0001$) outweighed female peafowl (peahen). The age of first laying for peahens was around 2 years. Majority of the farmers reared 21 to 60 birds with an average egg production of 22.90 ± 1.43 eggs/bird/year. The mean egg weight and clutch size were 95.70 ± 4.54 g and 9.30 ± 0.47 eggs, respectively. The average incubation time was 28.90 ± 0.43 days. Fertility and hatching rates were 87.30 ± 1.40 and $74.30\pm 1.07\%$, respectively. Majority of the farmers (80%) used poultry feed for feeding peafowls and routinely used drugs and additives in the feed and water. Forty percent of the farmers sought veterinary advice and 60% implemented general biosecurity procedures. The prevalence of Newcastle disease (20.70%) was significantly ($P<0.0001$) higher compared to other diseases. Despite numerous challenges, peafowl farming in Bangladesh was found to be highly profitable in comparison to the costs. However, effective training programs, research initiatives, and strategic marketing efforts are crucial for the development of peafowl farming as a new income generating venture in the country. Therefore, peafowl farming could flourish with targeted interventions and support from both the government and private enterprises in Bangladesh.

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Introduction

Bangladesh, with over 170 million people living in an area of 143,000 km², is among the world's most densely populated country. It has rich natural resources, especially terrestrial and marine biodiversity that includes nearly 1,600 species of wildlife comprising more than 64 species of amphibians, 171 reptiles, 722 birds, 600 fishes and 138 species of mammals (Rahman, 2015; Khan, 2018; Rahman, 2021). However, in the last century, Bangladesh lost a number of important mammal and bird species including the most beautiful and magnificent bird of the forest, the common peafowl (IUCN, 2015; Khan, 2015; Rahman, 2017; Khan, 2018; Rahman, 2021). The striking call and ostentatious plumage of the male peafowl, known as the peacock, make it one of the most identifiable birds in the world. The latter is particularly noticeable in the Asian species, when the bird exhibits a 'train' of hidden feathers with spots that resemble eyes during courtship (Anwar *et al.*, 2015; Rahman, 2021).

The peafowls comprised of three species, which belongs to the genera *Pavo* and *Afropavo* in the Phasianidae family within the Class Aves (Lucanov, 2013). There are two species in Asia, *viz.* common, blue or Indian peafowl, *Pavo cristatus* (indigenous to Indian subcontinent) and Burmese or green peafowl, *Pavo muticus* (primarily from Java, Indochina, and Myanmar), and one species in Africa, *viz.* Congo peafowl, *Afropavo congensis* (indigenous to the Congo Basin alone). Given its illustrious status in mythology, extensive range, and majestic appearance, it is reasonable that the common peafowl was designated as the 'National Bird of India' in 1963 (Ramesh and McGowan, 2009).

The natural geographical range of common peafowl is largely the Indian subcontinent, including the regions east and south of the Indus River, Jammu and Kashmir, East Assam, South Mizoram, and the entire Indian Peninsula (Sabesh, 2010). The species is extinct in Bangladesh, although it is rare in Bhutan and exists in considerable numbers in other subcontinental countries like Nepal and Sri Lanka; and there are only two populations in Pakistan (Ramesh and McGowan, 2009). The species was introduced in Andaman Islands (Ali and Ripley, 1980). Around 3,000 years ago, the Phoenicians

were the one who initially imported peafowl from India to Syria and Egypt. Approximately 600 years later, the Great Alexander took them to Greece (Yenilmez, 2020). The peafowl is globally popular, not only for its spectacular colors of the plumage and train feathers, but also for its meat, which was offered at aristocratic Roman banquets. During the Middle Ages, English Barons served roasted peafowl to their visitors. Thus, the peafowl spread to the world as symbol of wealth and power (Yenilmez, 2020). There are introduced populations of the species in the USA, Europe, Hawaii Islands, West Indies, South Africa, New Zealand, and Australia. The species has been kept in captivity for generations (Ramesh and McGowan, 2009). Because of its adaptability to various environments, it is currently one of the most popular ornamental birds in zoos and safari parks all over the world (Lucanov, 2013).

The species was once widely dispersed in Bangladesh's central, northwest, and northern deciduous forests, and arid regions (Khan, 2018). Captain Robert Christopher Tytler mentioned that Dhaka was obviously a good place for the peafowls to thrive (Tytler, 1854). To the best of knowledge, the last confirmed record (calls heard at night) was in the deciduous forest of Rathura, Sreepur upazila, Gazipur, Bangladesh in March 1986 (Khan, 2018), although Khan (2015) with his students failed to find any peafowl in the deciduous forest of Bhawal-Mirzapur area during 1985 to 1986. A number of vagrant common peafowls were occasionally seen in the border areas of northwestern Bangladesh between 2013 and 2017 (Khan, 2018), and in 2022 (personal communication). IUCN Bangladesh described the common peafowl as Regionally Extinct species in the country (IUCN, 2015), while the species is Least Concern in India and other neighboring countries (BirdLife International, 2019). It was speculated that conversion of its habitat and trapping for pet-trade were the two main reasons for the decline of its population in Bangladesh (IUCN, 2015).

Although, the common peafowl has been extirpated from its natural habitats in Bangladesh, it is still a common attraction in the country's zoo, safari parks and aviaries. Peacock feathers also have a great popularity internationally and, therefore, have

huge demand and value for decorating houses. Aristocrats also raise them in their house as pet or ornamental bird. Bird fanciers and traders around the world sustain breeding populations without requiring the capture of wild peafowl population. Although, commercial peafowl farming is popular in many parts of the world, it has not been commercialized in Bangladesh as of now. Recently, a few enthusiastic youths started peafowl farming for income generation. From 2009 to date Department of Livestock Services sold more than 400 peafowls to interested persons from the surplus population of the Bangladesh National Zoo, Mirpur, Dhaka (Personal communication). The peafowl farming could be a good source for supplying ornamental and pet birds to the enthusiastic persons who are willing to spend a fortune to purchase the birds from importers or other sources. Its management is similar to poultry; thus, peafowl farming could be an alternative source of income generation for the unemployed youths, which will ultimately contribute to raise the GDP of the country as it is a high-priced species. Therefore, if government permits, peafowl farming could be a new business venture in terms of income generation. In India, peafowls are commonly seen both in the wild and in commercial farms. Although a literature search revealed only a few discrete works on common peafowl in Bangladesh, no literature was found on the current status, distribution, farming prospect, reproductive behavior, biosecurity, and health management of this bird in captivity. Consequently, the objectives of the current study are to gather comprehensive and in-depth data regarding the current status, reproductive behavior and health management of common peafowl in farming system in Bangladesh.

Materials and Methods

Study Area and Time Frame

The study was carried out in six selected districts of the country, viz. Dhaka, Gazipur, Cumilla, Kishoreganj, Noakhali and Chattogram, based on the availability of the peafowl farms. The cross-

sectional survey was conducted between July 2022 and June 2023.

Development of a Questionnaire

The objectives of the survey guided the development of a pre-structured questionnaire. The questionnaire contained information on the study areas and farmer's details, e.g. age, sex, educational qualification, profession, passion etc.; farm details, e.g. number of peafowls, their variety etc.; information on farm management practices, e.g. total area of the farm, rearing system, housing materials, feeding etc.; reproductive parameters, e.g. age, sex, laying period, clutch size, egg incubation time etc.; biosecurity and health management practices as well as economics of peafowl farming.

Data Acquisition

To gather information (data), ten peafowl farmers in total participated in surveys and interviews. The number of peafowl farms surveyed in Dhaka, Gazipur, Cumilla, Kishoreganj, Noakhali and Chattogram were 3, 1, 1, 1, 1 and 3, respectively (Figure 1). To make sure the questions were not too difficult or unclear for the respondents, a pre-structured questionnaire was pre-tested, and any necessary modifications were made. The primary data was gathered through filling-up questionnaires and in-person interviews were conducted through personal visit to the farms. Prior to the commencement of the interview, the respondents were given a brief rundown of the study's objectives. The information was then recorded on the questionnaire after the questions were posed in simple, understandable language.

Statistical Analyses

The data of the experiment were collected, arranged, and processed for additional analyses in a Microsoft Excel worksheet. Descriptive statistics was used to calculate the mean, percentages, and standard error of mean (SEM). The processed data were analyzed using Graph Pad Prism version 9.0 (Graph Pad Software Inc., San Diego CA, 2020). To assess the variation between the parameters under investigation, the one-way analysis of variance (ANOVA) test was employed. The *P* values less than 0.05 indicated statistical significance for differences.

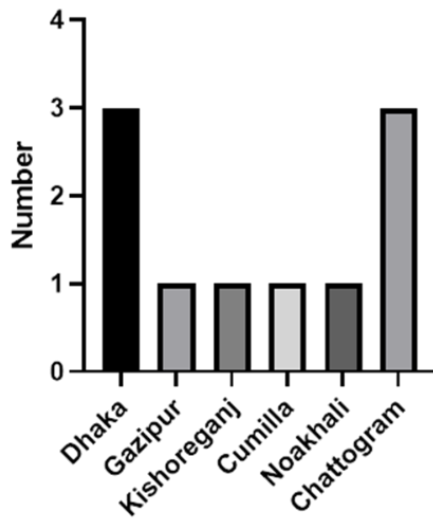


Figure 1. Number of peafowl farms in the survey areas of Bangladesh.

Results and Discussion

Peafowl Farmers' Personal Information

The survey was carried out in 10 peafowl farms in selected regions of Bangladesh. All the farms were run by men. Detailed scenario of peafowl farmers' personal information in different regions have been depicted in Table 1. Peafowl farming in Bangladesh

has enormous economic potential, but unlike other pet or ornamental bird industries, it is not yet effectively organized or commercialized. As a result, research on the current state, future prospects, and main obstacles of peafowl farming in Bangladesh is lacking. The majority of peafowl farms in the study area were operated by the farmers aged between 31 to 50 years. The primary occupation of majority of the peafowl farmers was business (50%), followed by studentship (20%) and poultry farming (20%). Their educational backgrounds were dominated by higher secondary (HSC) level (40%) and spanned from less than secondary (SSC) to master's levels. Almost all peafowl farmers were first-time growers who never attended any training or were exposed to any formal education on the subject. For the purpose of producing ornamental birds that might be sold for a profit, almost 40% of the farmers raised peafowls. The farmers were encouraged to do so through social media (40%), other farmers (30%) and friends (20%). It is interesting to note that roughly 50% of the farmers could encourage others to start new farms, thereby contributing to the growth of peafowl farming.

Table 1. Peafowl farmers' personal information from selected regions of Bangladesh (n=10)

Criteria	Groups	No. of farms (%)
Age of the farmer	<20 years	0 (0.0)
	Between 21 to 30 years	1 (10.0)
	Between 31 to 40 years	5 (50.0)
	Between 41 to 50 years	3 (30.0)
	≥ 51 years	1 (10.0)
Sex	Men	9 (90.0)
	Women	1 (10.0)
Occupation of the farmer	Business	5 (50.0)
	Service	0 (0.0)
	Studentship	2 (20.0)
	Farming	2 (20.0)
	Others	1 (10.0)
Training/Formal education	Yes	0 (0.0)
	No	10 (100.0)
Educational background	Below Secondary (SSC)	1 (10.0)
	Secondary (SSC)	2 (20.0)

Criteria	Groups	No. of farms (%)
	Higher Secondary (HSC)	4 (40.0)
	Bachelors	2 (20.0)
	Masters	1 (10.0)
Status of marriage	Married	8 (80.0)
	Unmarried	2 (20.0)
Purpose of farming	Ornamental bird production	4 (40.0)
	Egg production	1 (10.0)
	Chick production	3 (30.0)
	Mixed production	2 (20.0)
Source of encouragement in peafowl farming	Other farmers	3 (30.0)
	Neighbors	0 (0.0)
	Friends	2 (20.0)
	Social media	4 (40.0)
	Others	1 (10.0)
Role in spreading peafowl farming	Provide training	0 (0.0)
	Motivate to establish new	6 (60.0)
	Provide technical support	2 (20.0)
	Provide financial support	1 (10.0)
	Consultancy	1 (10.0)

Information on Peafowl Farms

The findings of the survey linked to peafowl farms-related information are presented in Table 2. It was discovered during this survey that all peafowl farms lacked registration. With an average of 21 to 60 birds per farm, almost 60% of the farmers raised peafowl for ornamental bird production to sell at a high price, as opposed to other types, including producing peafowl eggs and chicks to sell to other farmers. Just 10% of farmers raised peafowls alongside other birds or poultry; rest (90%) of the farmers only raised peafowls only in their farms. While the majority of farmers raised the common peafowl variety known as India Blue, which has wild colored plumage, one farm (10%) also raised additional varieties, such as Black-shouldered, Indian Blue Pied, Albino, and Opal White Eyed (Figure 2) as well as green or Burmese peafowl species (Figure 3). India Blue variety was also reared at the Wildlife Reproduction and Conservation Field Lab (WRCFL), Department of Gynecology, Obstetrics and Reproductive Health (GOR), Bangabandhu Sheikh Mujibur Rahman Agricultural University (BSMRAU), Gazipur (Figure 4). Seventy percent of the farmers wanted to expand their farm as the business was profitable. However, due to their lack of prior training and/or skill in farming, as well as ignorance of peafowl management, including health,

over 30% of farmers were found to be demotivated to continue peafowl farming.

Table 2. Peafowl farms-related information from selected regions of Bangladesh (n=10)

Criteria	Groups	No. of farms (%)
Farm type	Ornamental peafowl production	6 (60.0)
	Other types of peafowl production	4 (40.0)
Farm size	<20	2 (20.0)
	Between 21 to 40	3 (30.0)
	Between 41 to 60	3 (30.0)
	>60	2 (20.0)
Registration	Registered	0 (0.0)
	Unregistered	10 (100.0)
Whether rear with other poultry	Yes	1 (10.0)
	No	9 (90.0)
Name of the varieties	India Blue	9 (90.0)
	India Blue with other varieties*	1 (10.0)
Future plan	Want to expand farm	7 (70.0)
	Want to stop farm	3 (30.0)

*Green or Burmese peafowl species was also reared with different varieties of common peafowl.



Figure 2. Varieties of common peafowl (*Pavo cristatus*) in different peafowl farms. A) Black-shouldered male, B) India blue pied, C) Albino, D) Opal white eyed male (front), Black-shouldered female (back) and Albino female (middle) and E) Opal white eyed male in display.



Figure 3. Green/Burmese peafowl (*Pavo muticus*) male displaying in a peafowl farm at Tongi, Gazipur, Bangladesh.



Figure 4. Peafowls at WRCFL, Dept. of Gynecology, Obstetrics and Reproductive Health, BSMRAU, Gazipur.

Information on Farm Management Practices

The findings of the study on farm management practices are presented in Table 3. Our study revealed that total area of peafowl farms ranged between 45 to 140 square meters. The current survey indicated that 0.0, 20.0, and 80.0% of farmers raised peafowls in free range, semi-intensive and intense systems, respectively. The majority of the farmers (70%) used brick, net and tin as building materials to construct peafowl farms. Eighty percent farmers used poultry feed for feeding the birds. Feed waste is seen in many farms as a result of improper feeding techniques, and none of the peafowl producers surveyed computed feed efficiency (FE). Peafowl, like broiler chicken, need a diet rich in protein and other nutrients. As a result, feed costs went from making up half to two thirds of overall expenses in a poultry production system (Mbanasor and Sampson, 2004). Finding the peafowls that eat less while maintaining performance levels comparable to their peers is therefore essential. Peafowls in captivity require grass, poultry feed, maize, millet, and green vegetables once a day. Grower birds require a steady diet of grasses, veggies, and leaves. On the other hand, young peacocks require millet or a combination of tiny grains. In case of unavailability of enough insects, protein supplements, *e.g.* boiled

eggs must be provided. In addition, vitamin and mineral supplements should be included in the diet.

Table 3. Information on peafowl farm management practices from selected regions of Bangladesh (n=10)

Criteria	Groups	No. of farms (%)
Total area	Between 45 to 55 meters ²	3 (30.0)
	Between 65 to 75 meters ²	4 (40.0)
	Between 76 to 85 meters ²	2 (20.0)
	Between 93 to 140 square meters ²	1 (10.0)
Types of houses	Free ranging	0 (0.0)
	Semi-intensive	2 (20.0)
	Intensive	8 (80.0)
Building materials	Brick, net and tin	7 (70.0)
	Tin-shed and net	2 (20.0)
	Bamboo, net and tin	1 (10.0)
Different age groups in the same shed	Yes	8 (80.0)
	No	2 (20.0)
Ration formulation	Poultry ration	8 (80.0)
	Own formula	2 (20.0)

Information on Reproductive Performance

Table 4 summarized the survey's findings on peafowl reproduction. The average weights of mature peacocks and peahens were 7.50 ± 0.42 and 4.00 ± 0.36 kg, respectively. Adult peacock weight was significantly ($P<0.0001$) higher than adult peahen weight (Figure 5). The weight of the adult peafowl in the present study is similar to what Ali and Ripley (1983) documented. The initial laying age was 2.00 ± 0.13 years, which is consistent with Anon's (2002) findings. However, Sharma (1973) mentioned that common peafowl began to lay eggs at the age of 2.5 or 2.0 years. The current survey found that the average clutch size for a peahen was 9.30 ± 0.47 eggs, with an incubation period of 28.90 ± 0.43 days. The peafowl in this survey had an overall clutch size that was close to Anon's (2002) findings, which stated that the peahen lays 8 to 20 eggs in captivity with a 28 to 30-day incubation period. This survey revealed that peafowl eggs had hatchability and fertility rates of 87.30 ± 1.40 and $74.30\pm 1.07\%$, respectively.

Table 4. Information on peafowl reproductive performance from selected areas of Bangladesh (n=10)

Criteria	Mean±SEM
Adult peacock weight (kg)	7.50±0.42
Adult peahen weight (kg)	4.00±0.36
Age at first lay (year)	2.13±0.13
Average egg weight (g)	95.70±4.54
Egg production/season/bird (no.)	22.90±1.43
Clutch size (no.)	9.30±0.47
Incubation time (days)	28.90±0.43
Fertility of egg (%)	87.30±1.40
Hatching rate (%)	74.30±1.07

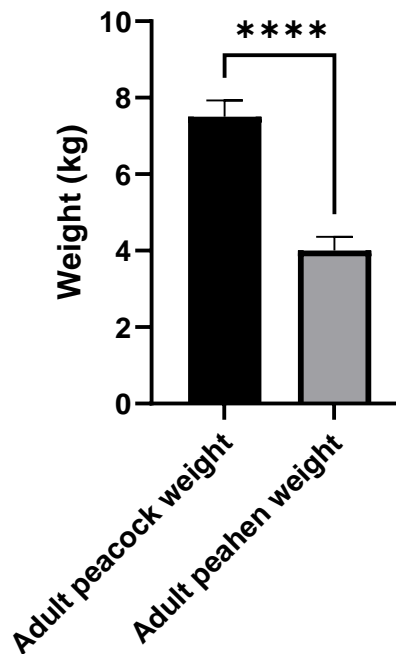


Figure 5. Average weight of peacock and peahen.

Values are given as mean±SEM. Asterisk (*) denotes significant differences among different groups at adjusted P value. **** ($P<0.0001$).

Information on Biosecurity and Health Management Practices

Information on biosecurity and health management practices connected to peafowl farms in selected regions of Bangladesh is depicted in Table 5. Although most of the farmers (90%) experienced diseases in their farms at some level, diseases were less frequent in majority of the farms (60%), frequent in 30% farms and rare in 10% farms. Forty percent of the farmers took veterinary advice at intervals, and 60% followed general biosecurity procedures. It is also noted that 80% of the farmers used drugs/additives in the feed and water regularly. In the current survey, it was also found that all the peafowl farmers vaccinated their flocks regularly. Most of the farmers vaccinated their peafowl against Newcastle disease (ND) and fowl cholera, whereas Bangladesh National Zoo, Dhaka practiced vaccination against ND, fowl pox and avian influenza (AI) (Miazi *et al.*, 2022; Personal communication). On the other hand, in WRCFL, we vaccinated peafowls against ND and AI only, which prevented occurrence of infectious diseases at BSMRAU.

Table 5. Information on biosecurity and health management practices connected to peafowl farms in selected regions of Bangladesh (n=10)

Criteria	Groups	No. of farms (%)
Occurrence of diseases	Yes	9 (90.0)
	No	1 (10.0)
Frequency of diseases	Frequent	3 (30.0)
	Less frequent	6 (60.0)
	Rare	1 (10.0)
Drugs and additives used with feed and water regularly	Yes	8 (80.0)
	No	2 (20.0)
Vaccination	Yes	10 (100.0)
	No	0 (0.0)
Veterinarian's/consultant's advice	Regularly	2 (20.0)
	At intervals	4 (40.0)
	Whenever needed	5 (50.0)
	Never	1 (10.0)
Endemic diseases	Yes	2 (20.0)
	No	8 (80.0)
Biosecurity measures	Strictly followed	2 (20.0)
	Generally followed	6 (60.0)
	Never followed	2 (20.0)

In the current study, it was found that a number of peafowls in different farms were affected with infectious, parasitic and nutritional diseases. Data on incidence of diseases in different peafowl farms in Bangladesh are presented in Table 6. The results revealed that ND, fowl pox, mycoplasmosis, fowl cholera, coccidiosis, ascariasis, mite infestation and nutritional diseases were 20.70 ± 0.37 , 9.00 ± 0.83 , 14.70 ± 0.40 , 8.90 ± 0.27 , 10.90 ± 0.43 , 10.70 ± 0.26 , 7.10 ± 0.34 and 10.5 ± 0.80 per cent, respectively.

Incidence of ND (20.70%) was significantly ($P < 0.0001$) higher than other diseases included in the study. Peafowl frequently experienced various infections, which typically manifested as subclinical diseases but could result in mortality (Freitas *et al.*, 2002). Both domesticated and wild common peafowls are susceptible to infection with a number of bacteria and virus as well as infestation with a number of endoparasites including protozoa (Hopkins, 1997). A number of factors were found to be responsible, *e.g.* unnatural environment, human encroachment on forest areas (Perrins, 1990) and, availability of vectors and intermediate hosts as well as urbanization (Kathiravan *et al.*, 2017). The most severe health and economic issues among diseases in peafowls were caused by protozoa, particularly coccidiosis (El-Shahawy, 2010), in contrast in the present study, ND was most prevalent. Although not in captive condition, Kathiravan *et al.* (2017) found high prevalence of protozoal, especially coccidial, infestations (43%) than helminths in the wild free ranging common peafowl in Tamil Nadu, India. On the other hand, in a study in Chittagong, Bangladesh, revealed 41.67% peafowls had both ascariasis and coccidiosis (Yadav *et al.*, 2021).

Economics of Peafowl Farming

Findings on the economics of peafowl farming in selected regions of Bangladesh in the present study is presented in the Figure 6. Mean value of initial capital, housing expense, peachick expense, feed expense/year, worker expense/year, other expense/year, total expense/year, total income/year and net profit/year of peafowl farmers were 750000 ± 52175 , 100800 ± 3571 , 543000 ± 22214 , 145000 ± 12845 , 117000 ± 8950 , 151600 ± 2266 , 1057400 ± 40426 , 3440000 ± 249533 and 2382600 ± 222890 BDT, respectively. The survey revealed that peafowl producers made a significantly large profit ($P < 0.0001$) relative to their total farming expenses. Therefore, the study came to the conclusion that peafowl farming is a feasible business venture and might provide unemployed population of the country with an innovative means of making money.

Table 6. Occurrence of diseases in peafowl farms in selected regions of Bangladesh (n = 10)

Diseases	Mean±SEM	F-value	P-value
Newcastle disease (%)	20.70±0.37	70.89	<0.0001
Fowl Pox (%)	9.0±0.83		
Mycoplasmosis (%)	14.70±0.40		
Fowl cholera (%)	8.90±0.27		
Coccidiosis (%)	10.90±0.43		
Ascariasis (%)	10.70±0.26		
Mite infestation (%)	7.10±0.34		
Nutritional diseases (%)	10.50±0.80		

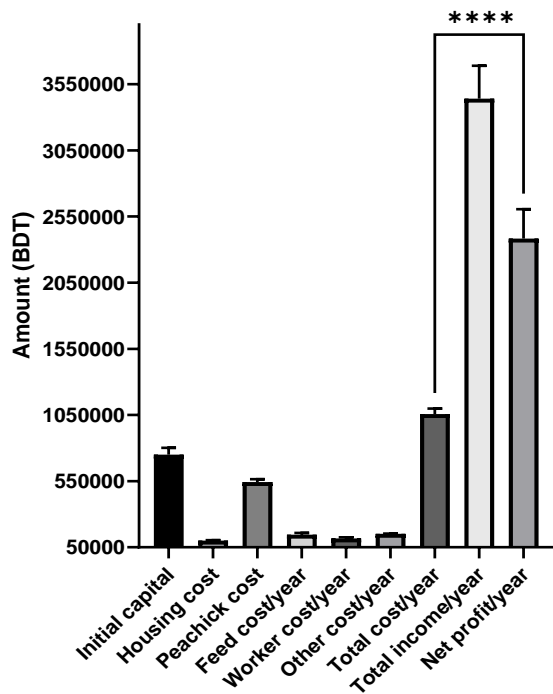


Figure 6. Economics of peafowl farming in selected regions of Bangladesh (n=10). Values are given as mean±SEM. Asterisk (*) denotes significant differences among different groups at adjusted *P* value. **** (*P*<0.0001).

Conclusions

The study surveyed the current status of peafowl farming and farmers as well as reproductive behavior and health management of common peafowl in selected regions of Bangladesh. The current survey

indicated that the majority of peafowl farmers were between the ages of 31 and 50, involved in either business, studentship, or farming, and had no prior experience or training in peafowl farming. The farmers reared Indian Blue variety than other varieties of common peafowl. They were encouraged to pursue peafowl farming by social media, other farmers or friends. The majority of the farms had between 21 and 60 peafowls on average, yielded 22.90 eggs per bird a year on average, and the birds started laying eggs as early as 2 years of age. The fertility and hatching rates of eggs were approximately 87% and 74%, respectively. Notably, all the farmers followed biosecurity and vaccination schedule in their farms. The diseases occurred infrequently in the farms included in the study. However, most of the farmers sought veterinary services for treatment of affected birds. The prevalence of Newcastle disease was higher in peafowls compared to other diseases. Despite numerous challenges, peafowl farming in Bangladesh was found to be highly profitable in relation to the expenses. However, effective training programs, research initiatives, strategic marketing efforts, support from government and private enterprises are crucial for the development of peafowl farming as a new income generating venture in foreseeable future.

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Declaration

The authors said they have no conflicting agendas.

Authors' Contributions

ANMAR originated the idea, acquired funds, and designed the experiment; ANMAR, MNH, and MTI oversaw the study; ANMAR, MAS, and KHS carried out the experiments and collected data; MAS analyzed the data; MAS and ANMAR drafted and amended the text; and MNH, ZCD, and NZR evaluated, edited, and revised the final manuscript. Each of the manuscript's authors acknowledged that they had read and approved the submitted version.

References

- Ali S and Ripley SD 1980. *Handbook of the Birds of the India and Pakistan, Vol 2: Megapodes to Crab Plover*. Oxford University Press, New Delhi, India, pp. 1–347.
- Ali S and Ripley SD 1983. *Handbook of the Birds of India and Pakistan (Compact Edition)*, Oxford University Press, Mumbai, India, pp. 1–456.
- Anon 2002. *Wildlife of the Punjab*. Punjab Wildlife and Parks Department, Panjab, India, pp. 13–14, 25.
- Anwar M, Mahmood A, Rais M, Hussain I, Ashraf N, Khalil S and Qureshi BUD 2015. Population density and habitat preference of Indian peafowl (*Pavo cristatus*) in Deva Vatala National Park, Azad Jammu and Kashmir, Pakistan. *Pakistan Journal of Zoology* **47**(5): 1381–1386.
- BirdLife International 2024. Species factsheet: *Pavo cristatus*. <Downloaded from <http://datazone.birdlife.org/species/factsheet/indian-peafowl-pavo-cristatus> on 30/01/2024>
- El-Shahawy IS 2010. *Eimeria pavaegyptica* sp. nov. (Apicomplexa: Eimeriidae) in faeces of Indian Peacocks, *Pavocristatus* Linnaeus, 1758 (Galliformes: Phasianidae) from Egypt. *Memórias do Instituto Oswaldo Cruz* **105**: 965–969.
- Freitas MFL, Oliveira JB, Cavalcanti MDB, Leite AS, Magalhaes VS, Oliveira RA and Evencio-Sobrinho A 2002. Gastrointestinal parasites of captive wild birds in Pernambuco State, Brazil. *Parasitologia Latinoamericana* **57**(1–2): 50–54.
- Hopkins C 1997. Peafowl husbandry. *Game Bird and Conservationists Gazette* **6**: 37–39.
- IUCN Bangladesh 2015. *Red List of Bangladesh Vol 3: Birds*. IUCN, International Union for Conservation of Nature, Bangladesh Country Office, Dhaka, Bangladesh, pp. 1–676.
- Kathiravan RS, Ramachandran P, Shanmuganathan S, Karthikeyan A, Sathiyamoorthy N, Gollapalli SK, Silambarasan R, Bhinsara D and Madesh E 2017. Prevalence of endoparasitic infection in free ranging peacocks of Southern Tamil Nadu, India. *International Journal of Current Microbiology and Applied Sciences* **6**(10): 366–371. <https://doi.org/10.20546/ijcmas.2017.610.045>
- Khan MAR 2015. *Wildlife of Bangladesh: Checklist-Cum-Guide*. Chayabithi, Dhaka, Bangladesh, pp. 1–240.
- Khan MMH 2018. *Photographic Guide to the Wildlife of Bangladesh*. Araynnak Foundation, Dhaka, Bangladesh, pp. 1–488.
- Lucanov H 2013. *Peafowl Species and Their Mutations*. Trakia University, Stara Zagora, Bulgaria, pp. 1–15.
- Mbanasor JA and Sampson A 2004. Socio-economic determinants of turkey production among Nigerian soldiers. *International Journal of Poultry Science* **3**(8): 497–502.
- Miazi OF, Khan MMH, Jalil MA, Das A and Shaha M 2022. Preventive measures and management systems against diseases and abnormalities of Indian peafowl in Bangladesh National Zoo. *Journal of Dairy, Veterinary & Animal Research* **11**(1): 27–31.
- Perrins CM 1990. *The Illustrated Encyclopedia of Birds*. Headline book publishers, London, pp. 40–41, 148–149, 152–153.
- Rahman ANMA 2015. *Wildlife of Bangladesh*. Department of Film & Publication, Ministry of Information, Dhaka, Bangladesh, pp. 1–240.
- Rahman ANMA 2017. The lost peafowls of Bangladesh. *Bangladesh Quarterly* **38**(1): 49–54.
- Rahman ANMA 2021. *Various Birds of Bangladesh in My Eyes* (2nd Ed. in Bangla). Boighor, Dhaka, Bangladesh, pp. 1–528.
- Ramesh K and MCGowan P 2009. On the current status of Indian peafowl *Pavo cristatus* (Aves: Galliformes: Phasianidae): Keeping the common species common. *Journal of Threatened Taxa* **1**(2): 106–108. doi:10.11609/JoTT.o1845.106-8
- Sabesh R 2010. The Peacock – Our National Bird. *Eco News* **16**(2): 5–7.
- Sharma IK 1973. Ecological studies of biomass of the peafowl (*Pavo cristatus*). *Tori* **22**(93–94): 25–29.

- Tytler RC 1854. Miscellaneous notes on the fauna of Dacca, including remarks made on the line of march from Barrackpore to that station. *The Annals and Magazine of Natural History* **14**(81): 168–177.
- Yadav SK, Sarkar S, Sarkar S, Siddiki AZ 2021. Prevalence of endoparasites and ectoparasites of captive peafowl farm. *Advances in Animal and Veterinary Sciences*, **9**(3): 442–445. DOI:10.17582/journal.aavs/2021/9.3.442.445
- Yenilmez F 2020. Peafowl Production. *Turkish Journal of Agriculture - Food Science and Technology* **8**(4): 945–948. <http://doi.org/10.24925/turjaf.v8i4.945-948.3198>