International Journal of Agricultural Science, Research and Technology in Extension and Education Systems (IJASRT in EESs)
Available online on: http://ijasrt.iau-shoushtar.ac.ir
ISSN: 2251-7588 Print
ISSN: 2251-7596 Online
2025: 15(1): 47-55

Received: 25 November 2024
Reviewed: 01 February 2025
Revised: 06 February 2025
Accepted: 18 February 2025

An Assessment of Backyard Farming Concerning Native Chickens, Their Production and Management System in Selected Areas of Bangladesh

Sharmin Sultana[1], Syidul Islam[1], Md. Ashraful Islam[1], Razia Khatun[1*] and Shamim Ahmed[2], Shakila Faruque[3]

[1]*Farming System Research Division, Bangladesh Livestock Research Institute, Savar, Dhaka-1341*
[2]*Support Service Division, Bangladesh Livestock Research Institute, Savar, Dhaka-1341*
[3]*Poultry Production Research Division, Bangladesh Livestock Research Institute, Savar, Dhaka-1341*
**Corresponding author's email: rkbaby96@yahoo.com*
Orchid ID: https://orcid.org/0009-0009-6281-6076

Abstract

Most Bangladeshi poultry production is done in backyards, yet the system's advancement is unsatisfactory. The current study was conducted to evaluate the raising method, feeding and management practices, and production performance of native chicken. A baseline assessment was carried out using a structured questionnaire regarding the production and potentialities of native chicken germplasm. Primary and secondary data were gathered between June to August 2023, covering eight districts - Pabna, Rangpur, Feni, Sherpur, Pirojpur, Patuakhali, Joypurhat, and Sunamgonj being chosen from six divisions of Bangladesh to cover at least one upazila from each division. A total of 260 farmers' households were surveyed by interviewing and directly observing the production status of native chicken farmer's. The study focused on parameters including the number of native chickens, the state of housing, their upbringing method, the dietary management, their reproductive and productive performances etc. A semi-extensive raising strategy was employed by maximum farmers, yielding around 53.8% Native grower chicken and layer takes an average of 59.01±0.25gm and 71.55±0.40gm of feed respectively. The average mature male and female body weight were 1.45±0.29kg and 1.15±0.02kg, respectively. The average annual egg production was 106.15±1.11. The native chicken's rearing method, feeding strategy, and production output all were in moderate condition. To get the maximum harvest from the native chicken raisers, a need-based extension program should be implemented, with an emphasis on increasing awareness and understanding of the scientific methods of native chicken farming as a whole.

Keywords
Productive Performance, State of Housing, Raising Strategy, Dietary Management, Native Chicken

1. Introduction

Since the great majority of people rely on livestock as their primary supply of animal protein—such as meat, milk, and eggs—livestock plays a significant role in a nation's prosperity. In Bangladesh's rural areas, backyard poultry farming is a traditional method of raising chickens that supports family economies and provides food for subsistence (Shanta et al., 2017). Among poultry birds, chickens are considered one of the most significant and prevalent avian species which provides a vital source of animal protein for human consumption. In developing countries, poultry meat and eggs contribute approximately 20% of the dietary protein (Alders et al., 2009). In Bangladesh, about 90% of rural households maintain small flock of chickens through a scavenging or semi-scavenging method. Most of these free-ranging scavenger poultry are native or indigenous, raised in modest numbers within their home premises using

conventional management practices. Chickens are the most common species of poultry, followed by ducks and smaller quantities of pigeons, geese, and quail usually reared by the farmers.

There are several types of native chickens have been documented so far including the Hilly chicken, Naked Neck, Aseel, Yasine, native dwarf, frizzled plumage, and common native birds of non-idiosyncratic typical type (Das et al., 2008). Small-scale farmers, who may not have the resources for rearing larger livestock, can easily raise a modest flock of hens or ducks on their property. Typically, each rural household keeps fewer than 20 birds—whether hens, ducks, or pigeons, individually or in combination. Poor farmers may easily raise a small flock of hens or ducks on their property even if they cannot keep larger animals. In addition, these birds primarily depend on household waste, crop residues, insects, and other readily available feedstuffs also occasionally consume a small amount of supplemental feeds provided by the flock owner during the day. Significantly lower annual output of meat and eggs appears from native fowl, resulting in only 35 to 40 eggs with low egg mass (35 to 37 g/egg) and 1 to 1.5 kg of meat (Das et al., 2008). Improved diets may significantly enhance the growth performance of local hens raised in captivity (Chowdhury et al., 2006). Altering the husbandry procedures might lead to a more than twofold increase in the egg output of native (Deshi) layer chickens (Sarker and Bell, 2006). The insights obtained from the research could be crucial in taking informed decisions for improving the management practices and production system of native chicken. The present research aimed to gain a comprehensive understanding of the current chicken-rearing systems and production. Thus, this study was conducted with addressing the following objectives:

To identify the shortcomings in the current management system for native chicken farming.

To evaluate the native chickens' productive and reproductive conditions.

To provide recommendations for potential native chicken production and management systems.

2. Materials and Methods

2.1 Study site

A total of Eight (08) districts—Pabna, Rangpur, Feni, Sherpur, Pirojpur, Patuakhali, Joypurhat, and Sunamgonj were chosen from six divisions of Bangladesh for initial data collection. Eight districts were chosen, and data were gathered to cover at least one of the upazilas from each district. Pabna is located in between 23°48' and 24°21' north latitudes and 89°00' and 89°44' east longitudes, forming the South-east boundary of Rajshahi Division. Rangpur, Sherpur and Joypurhat are the districts in Northern Bangladesh where Rangpur extends from 25°03" 29°32" East longitude. Sherpur district is located in between 24°18' and 25°18' North latitudes and in between 89°53' and 90°91' East longitudes where Joypurhat is situated in between 24°51' 25°17' North latitudes and 88°17' and 88°15' East longitudes. This district is located besides the Boleswor River at 22°30'00'' with 22°52'00" North longitudes and 89°52'00'' with 90°13'00" East longitudes. Feni is a coastal district situated in the Eouth-east of Bangladesh, within the Chittagong Division and located in between 22°44' and 23°17' north latitudes and in between 91°15' and 91°35' East longitudes. Pirojpur is a district in south-western Bangladesh and it is a part of Barisal division. Patuakhali is a district in South-central Bangladesh and it is a part of Barisal Division. This district is located in between 21°48' with 22°36' North longitudes and 90°08' with 90°48' east longitudes. Sunamganj is a district of North-eastern Bangladesh in Sylhet Division where this district extends in between 24°34' North longitudes and 25°12' East longitudes.

2.2 Data collection

A baseline survey was carried out to understand the current state of native chicken farming and its management system in the selected regions of Bangladesh. To concentrate on the goals or aims of the study, a systematic questionnaire on the production and potentialities of local chicken germplasm was formulated and pretesting was also carried out. Data were collected from available primary and secondary sources between June and August of 2023. A total of 30 native chicken-raising farmers were interviewed in person through the structured questionnaire and direct observation of the farmer's household. About 50 from Patuakhali and a total of 260 farmer's data were gathered from each selected district. Simple and easy questions were used to ensure the easy understanding by the farmers and maximize the accuracy of the obtained data. Information on Key Informant Interviews (KIIs) was also gathered from Upazila Livestock Office and relevant experts of livestock sector in each location's. The information on issues and solutions involved in Native chicken farming were accumulated by KIIs. Focus was placed on the relevant quantitative and qualitative data during the data-collecting process. A variety of sources, including books, Goggle Scholar, journals, thesis papers, government documents, and Bangladesh's statistics yearbooks were also used to collect and compile secondary data. Data on native chicken production, eggs, housing, hatching, brooding, and management practices were also included in the survey.

2.3 Statistical analysis

Microsoft Excel sheets were used to enter, sort, assemble, tabulate, and arrange the collected data and statistically analyse especially descriptive statistics including- frequency distribution, percentage, mean value and standard error using the Statistical Package for the Social Sciences (SPSS), Version 25.0.

3. Results and Discussion

3.1 Population Dynamics of Native Chickens (past and present years)

In order to understand the current as well as past year populations in the research areas, the native chicken population/household was divided into roaster, hen, and chick categories. In the most recent year (2023), Patuakhali district had the largest average number of hens (8.68±0.56) and chicks (14.32±0.82) rearing farmers, while Sherpur district had the lowest average of roasters (3.43±0.67) per household. The largest average number of chicks (10.86±1.07) reared in Sunamgonj district, 10.66±1.24 hens, and 7.20±1.03 roasters in Joypurhat district occurred the prior year. In the Feni district, farmers raised a minimum of 2.26±0.34 roasters, 3.96±0.32 hens, and 4.50±0.45 chicks per family. In the Rangpur district, however, farmers raised a minimum of 1.80±0.39 roasters, 4.53±0.79 hens, and 5.53±0.41 chicks in the previous year. Native chicken population per household for the years prior and current in the chosen locations are shown in the Table 1. The study's findings showed that while the number of chicks raised was grown, the number of hens and roasters raised was dropped in comparison to prior years. The native chicken population's average flock size was 18.79±0.69 in 2022, with Joypurhat showed the largest flock size at 28.56±2.93, and Rangpur had the lowest flock size at 12.76±0.74. The native chicken average flock size was 17.98±0.62 in 2023, with Rangpur exposed the lowest flock size at 11.86±0.86 and Patuakhali had the largest at 25.74±1.19. In Pabna, Rangpur, Joypurhat, Feni, and Sunamgonj, there was a declined in the number of native chickens and a smaller population than the previous year. The increased number of native chicken flocks in Sherpur, Pirojpur, and Patuakhali was observed in comparison to the previous year.

Table 1. Native chicken population per household in the chosen locations for the years prior and current

Locations	Average chicken population/household (Mean±SE)							
	Previous year				Present year			
	Roaster (n=862)	Hen (n=1643)	Chick (n=2381)	Total flock size (n=4886)	Roaster (n=733)	Hen (n=1577)	Chick (n=2366)	Total flock size (n=4676)
Pabna	5.06±0.32	6.10±0.49	8.00±1.09	18.90±1.58	2.86±0.30	4.70±0.44	6.34±0.83	13.70±1.18
Rangpur	2.23±0.17	5.00±0.39	5.53±0.41	12.76±0.74	2.50±0.23	4.86±0.44	4.50±0.45	11.86±0.86
Joypurhat	7.20±1.03	10.66±1.24	10.70±1.43	28.56±2.93	3.03±0.51	5.26±0.75	7.46±1.12	15.76±2.10
Sherpur	2.93±0.96	5.26±0.06	5.63±0.95	13.83±2.00	3.43±0.67	7.96±1.21	9.00±1.21	20.40±2.28
Pirojpur	1.80±0.39	4.53±0.79	8.33±1.36	14.66±2.21	2.36±0.31	7.20±0.65	11.80±1.44	21.36±1.85
Feni	3.63±0.70	6.66±0.69	12.56±1.29	22.86±1.95	2.26±0.34	3.96±0.32	7.70±0.83	13.93±1.12
Sunamgonj	2.53±0.35	5.56±0.64	10.86±1.07	18.96±1.54	3.40±0.83	4.13±0.47	8.40±1.02	15.93±1.54
Patuakhali	2.00±0.20	6.58±0.45	10.80±0.79	19.38±1.22	2.74±0.18	8.68±0.56	14.32±0.82	25.74±1.19
Overall	3.31±0.22	6.31±0.26	9.19±0.40	18.79±0.69	2.81±0.15	6.06±0.25	9.13±0.40	17.98±0.62

3.2 Native chicken housing management and the rearing System

About 53.8% of farmers relied mostly on rearing their native chickens for semi-extensive crops, 35.8% on scavenging, and 3.1% did not offer any house or just provided little protection at night. While 5% of farmers used a semi-intensive raising method that involved scavenging their native chicken, 0.4% and 1.9% of farmers used a floor and cage technique. The housing management and rearing systemof Native chicken are given in Table 2.

The birds were utilized the surrounding areas for a considerable amount of feed during the day and sought refuge within the house at night. Tin made up 59.6% of the homes, followed by wood (13.8%), brick (10.4%), bamboo (9.2%), earth (5.4%), and net 1.5%. Soil took up 33.1% of the floor of the chicken coop and wood 39.2%. Native chicken houses were also built with floors made of brick (8.8%) and bamboo (18.8%).

Table 2. Native chicken housing management and rearing system in the research regions

Rearing System	Percent (n=260)	Housing Materials	Percent (n=260)	Floor type	Percent (n=260)
Floor rearing	0.4 (1)	Brick	10.4 (27)	Brick	8.8(23)
Cage rearing	1.9 (5)	Tin	59.6 (155)	Soil	33.1 (86)
Scavenging	35.8 (93)	Bamboo	9.2 (24)	Wood	39.2 (102)
Semi-extensive	53.8(140)	Soil	5.4 (14)	Bamboo	18.8 (49)
Semi-extensive and Scavenging	5 (13)	Wood	13.8 (36)	-	-
No Specific Housing for native chicken	3.1 (8)	Net	1.5 (4)	-	-

3.3 Feeding management

Farmers fed their native chickens either entirely or partially through the scavenging method; other farmers fed their chickens only a small quantity of home supplement grain. Native hens were divided into three groups for food management: layer (17–72 weeks), grower (9–16 weeks), and chick (0–8 weeks). An almost comparable quantity of supplement feed was given by farmers to their native chicken, resulting in an average of 33.56±0.42gm to 34.43±0.72gm for chicks and 59.01±0.25gm and 71.55±0.40gm for grower and layer native chicken. The feed supply quantity for native chicken at various ages is shown in Table 3.

3.4 Native chicken production performance (Common Deshi)

The male and female mature body weights were greatest in Feni district were 2.11±0.11 kg and 1.61±0.08 kg, respectively, while the lowest male and female mature body weights were 1.15±0.01 kg and 0.94±0.01 kg in Sherpur and Rangpur district. The highest recorded age of first egg production in Sunamgonj district was 180.17±1.10 days, while the lowest recorded age was 173.89±1.05 days in Rangpur district. Native chickens varied in age from 5.65±0.33 to 16.92±1.16 years, and farmers had expertise in raising them. In Pabna, the average egg production per year was 120.16±2.4 whereas in Pirojpur district, it was 81.00±1.67. The production performance and experience of native chicken raising in the selected locations are shown in Table 4.

Table 3. Native chicken feed supply quantity (Mean±SE) at various ages in the designated locations

Upazila	Chick (0-8 weeks)	Grower (9-16 weeks)	Layer (17-72 weeks)
Pabna	33.93±0.79	58.40±0.75	70.00±1.16
Rangpur	33.56±0.42	59.43±0.73	71.33±1.15
Joypurhat	35.00±0.65	58.83±0.72	73.50±1.46
Sherpur	34.20±0.80	59.10±0.65	72.96±1.18
Pirojpur	34.43±0.72	59.76±0.76	71.60±1.37
Feni	34.30±0.70	59.43±0.71	72.70±1.14
Sunamgonj	34.03±0.79	58.20±0.75	71.66±1.06
Patuakhali	33.98±0.65	58.96±0.64	69.80±0.71
Overall	34.16±0.25	59.01±0.25	71.55±0.40

Table 4. Production characteristics and experience (Mean±SE) of native chicken (commom deshi) raising in the chosen locations

Upazila	Male mature body weight (kg)	Female mature body weight (kg)	Average egg production/year	Age of 1st egg production (days)
Pabna	1.24±0.01	1.24±0.01	120.16±2.41	175.17±1.03
Rangpur	1.15±0.01	1.14±0.01	105.34±2.51	173.89±1.05
Joypurhat	1.28±0.04	0.86±0.02	95.00±2.15	178.60±1.63
Sherpur	1.32±0.04	0.94±0.01	116.96±2.10	178.33±0.87
Pirojpur	1.98±0.13	1.51±0.10	81.00±1.67	177.03±1.20
Feni	2.11±0.11	1.61±0.08	106.03±3.76	179.44±0.77
Sunamgonj	1.42±0.08	1.16±0.04	102.89±3.57	180.17±1.10
Patuakhali	1.30±0.02	0.97±0.02	112.04±2.09	179.90±1.02
Overall	1.45±0.29	1.15±0.02	106.15±1.11	177.98±0.41

Table 5. The optimal method for hatching eggs to generate more chicks in the designated locations

Hatching System	Percent (n)	Best systemof Hatching	Percent (n)
Natural Egg incubation	97.7 (254)	Natural	16.9 (44)
Synthetic Artificial	2.3 (6)	Artificial/Synthetic	83.1 (216)

Table 6. Native chicken hatchling egg selection and storage systemin the designated locations

Criteria for Hatching egg selection	Percent (n=260)	Egg storage time	Percent (n=260)	Egg storage system	Percent (n=260)
Large Egg	12.7 (33)	7 days	5.4 (14)	Hari	85.0 (221)
Hard Shelled egg	7.3 (19)	10 days	61.5 (160)	Freeze	1.5 (4)
Fresh Egg	7.7 (20)	15 days	33.1 (86)	Bamboo cage	4.6 (12)
All Egg	72.3 (188)			Egg tray	8.8 (23)

Table 7. Native chicken broodiness management and chick brooding time in the designated locations

Average broodiness and chick brooding Time		Broodiness Removal Method	
Parameters	(Mean±SE)	Parameters	Percent (n)
Laying period/ Clutch (days)	16.83± 0.28	No method use	76.9 (200)
No. of clutches per year	4.56±0.25	Tie up with Rope	13.8 (36)
Laying interval after natural incubation & broodiness (days)	64.70±1.56	Bath in water	9.2 (24)
Natural brooding time (days)	24.15±0.61	Brooding of DOC by Hen	96.5 (251)
Artificial brooding time length (days)	17.25±2.35	Artificial Brooding of DOC	3.5 (9)

3.5 Hatching eggs management and incubation Process

Farmers mostly relied on a natural broody hen incubation technique, to increase the number of chicks from fertilized eggs. About 97.7% of farmers followed the natural egg incubation technique, whereas 2.3% used artificial incubation. Additionally, because of broody hens were difficult to maintain and were not always accessible, 83.1% of farmers thought that the artificial incubation systemwould be the greatest method for hatching, while 16.9% favoured the natural incubation procedure. Additionally, if chickens were used for egg incubation, they will eventually start laying again. Table 5 shows the optimal method for hatching eggs to generate more chicks in the designated locations.

Hatching eggs were picked by framers based on the size and thickness of the eggshell in the designated zones. Because native chickens produced very few eggs, around 72% of farmers chose to hatch all of the eggs. Out of all the farmers, 13% chose large-sized eggs, 8% chose fresh eggs, and 7% chose hard-shelled eggs. In the research region, hatching eggs were stored for a duration ranging from 7 to 15 days. Table 6 shows the hatchling egg selection, storage time and storage system of Native chicken in the designated locations 62% of farmers kept hatching eggs for a maximum of 10 days, whereas 33% and 5% kept them for 15 days and 7 days, respectively. Because egg storage duration was dependent on the hen's broodiness and the quantity of eggs preserved for hatching, it varied among research regions. In the hari, hatching eggs were kept by 85% of farmers, while near 1%, 5%, and 9% were kept in egg trays or bamboo cages. Only 1% of farmers kept their hatching eggs in the refrigerator.

3.6 Broodiness and broody hen management of Native chicken

The average egg-laying period (clutch) of Native chicken was observed at 16.83±0.28 days where the average no. of laying clutches/year, laying interval after natural incubation & broodiness and brooding time were 4.56±0.25, 64.70±1.56 days and 24.15±0.61days respectively. The broodiness management and chick brooding time of native chicken in the designated locations are shown in the Table 7.

Furthermore, it was found that 76.9% of farmers employed no method at all to get rid of the broodiness, while 13.8% practiced tying up with rope and 9.2% followed the practice of bathing their native chicken to get rid of the broodiness of native chicken in the research areas. The majority of farmers, 96.5%, engaged in natural chick brooding, with an average brooding time of 24.15±0.61 days; only 3.5% engaged in artificial brooding, with an average brooding length of 17.25 ± 2.35 days.

Discussion

Native chicken population per household in the chosen locations for the years prior and current years were in line with the findings of Weyuma et al. (2015), who reported that the flock size was Chick 9.90 ± 4.98, Cock 1.8 ± 1.2, Cockerel 2.0 ± 1.3, Pullet 2.5 ± 1.50, Hen 3.9 ± 3.5, and Overall Flock size 19.9 ± 7.9; In the study of Lemma et al.

(2019), they reported that the average number of chickens per household was 8.8±2.9, with a minimum of 3 and a maximum of 20, and the mean flock composition for chicks, pullets, hens, and cocks was 7.11 ±1.3, 8.4±0.4, 2.7±0.3, 6.2±0.97, and 2 ±0.4; The flock size as 29.79±0.28 number per household was mentioned by Islam et al. (2021).

The present result observed on Native chicken population per household was differed significantly from that of the study Islam et al. (2007), who reported that the flock size was 9.36±1.04 in Rajshahi and 7.84±0.62 in Sylhet, and Alam et al. (2014) reported that the number of chickens raised by each farmer ranged from 1 to 31 with an average of 10.4. According to the Agriculture Sample Census 2020, there were 9.77 native chickens per household (Shinde and Srivastava, 2006; Sethi, 2007). According to Rawat et al. (2016), flock sizes varied from five to fifty birds. Based on the study of Goromela et al. (2006), the average number of native poultry birds per rural family might range from one to ten. According to Sankhyan et al. (2013), the average flock size was 9.4; however, Bharti and Sagar (2020) indicated that the average flock size was overall 7.38. The size of the native chicken flock varied throughout experiments because data were gathered from various sites and analyses were conducted at various periods. The range of outcomes was likewise rather near to the current investigation.

Native chicken housing management and rearing system in the research regions were closely related to those of Rahima et al. (2023), who reported that semi-scavenging housing accounted for 97.64% of the total, while intensive housing accounted for only 2.35 percent. In the study of Riise et al. (2005), they stated that scavenging production systems account for the majority of poultry production in most tropical countries, with an estimated 80% of the population in Asia and Africa being based on these traditional systems. According to Haunshi et al. (2011), raising local Indian breeds of birds on a free-range system is a lucrative endeavour. In addition, Khan et al. (2006) stated that the house's roof was composed of 63% tin, 5% bamboo, 32% wood, 10% tin, 67% wood, 16% brick, and 26% paved floor with mud made up of 74%. According to 70.4% of farmers surveyed in that research, their houses were cleaned regularly, but not with enough disinfection. The results of the present study were agreement with their statement.

In present research, the feed supply quantity of native chicken at various ages in the selected region was slightly different from the results of Rahima et al. (2023) where they reported that the feed supply per chicken was 32.77gm daily, but it was somewhat similar to the findings of Alam et al. (2014) and Faruque et al. (2007) where they stated that the feed consumption at laying stage was observed under intensive management care at 83.7±1.1g/b/d. This discrepancy was noted since the study was conducted in various settings and data was gathered based on varying age groups of native chicken.

The results on production performance and experience of native chicken (commom deshi) raising in the chosen locations mostly related to the findings of Das et al. (2008) indicated that the mature body weight of native chicken was 1141 g/bird, which was almost equivalent to the average body weight of the studied area mature male chicken (1.45±0.29) and mature female chicken (1.15±0.02). While in the study of Rahima et al. (2023), they claimed that the mature body weight of the chicken was 1.19kg; According to Shahjahan et al. (2011), the mature body weight of the full-feathered deshi chicken was 1.28kg for the male and 1.08kg for the female. In the findings of (Uddin, 2002) they stated in a different research that the average body weight of native chicken was 1144 ± 266g. These findings were corroborated by Alam et al. (2014), who indicated 1.19 kg of mature body weight. According to Islam et al. (2007), local chicken from Chandanais had the greatest average body weight (1357.21g) and the lowest (906.64g) of any place in the world. These findings were consistent with the current investigation.

Overall egg production came up at 112.04±2.09, almost matching the results of Bharti and Sagar (2020), who found that the average number of eggs produced, was 96.25. In the study of Weyuma et al. (2015), they observed 44.20±9.6 eggs laid per hen annually; Das et al. (2008) reported 35–40; Sarker and Bell (2006) mentioned 40–54; Rahima et al. (2023) 37.27; Alam et al. (2014) 42; Shahjahan et al., (2011) noted 49.64±1.3. Additionally, according to Sonaiya (2005), chickens in Nigeria reach maturity at 24 weeks of age and may lay 3 clutches of 10 eggs apiece (30 eggs annually). The published data was not as high as the current investigation. The reason for this difference was the small sample size of data that was gathered from certain Native chicken producers in the chosen region of Bangladesh. The age of the native chicken at first egg laying was 177.98±0.41, which was comparable to the findings of Ershad (2005), who reported that the age of the native chicken at first egg laying was 175.00 ±2.02 days. Lower egg output of native chicken under Backyard poultry production system was the indicator of inadequate feeding and management practices. Thus, improvement is required in genetic level to optimize the overall production performance.

In keeping with the findings of Islam et al., (2021), who claimed that 100% of native chicken eggs underwent natural incubation, Hatching Eggs and Broodiness Management practices in the present research was associated with the findings of Islam et al., (2021) indicated that 14.0% of eggs were selected based on size, 17.5% on cleanliness, and 68.50% on soundness; According to Addisu et al., (2013), 88.24% of village chicken owners in the North Wollo zone chose eggs based on size; Argaw, (2015). mentioned that 53 percent of respondents chose incubation eggs based on size, shape, and season of laying, while 23 percent chose based on the age of the egg and 16% on the size of the egg. Based on egg size, the majority of Ethiopian respondents were choosing their eggs, mentioned by Lemma et al., (2019). In the findings of Argaw (2015), they reported that farmers stored eggs directly on the laying nest (58%), in a

cold room (8%), or on grain (33%). The most common egg storage materials in Ethiopia's low, medium and high-land regions were plastic (28.8%), basket (28.4%), and bamboo basket (34.1%), followed by pot made of clay or cow dung (23.9%), pot (23.8%), and basket (25.4%) stated by Lemma et al., (2019). Egg storage materials varied widely; the most common ones were hari, bamboo cages, egg trays/pots, and refrigerators, which were located in a select few farmers' homes and were dependent on their availability.

The current findings were comparable to those of Lemma et al., (2019), who mentioned that the methods used in Ethiopia to remove broodiness included disturbing the nest (19%), moving to neighbour's (12.7%), disturbing, and hanging (20.7%). The results on broodiness and broody hen management of native chicken was closely similar to the findings of Sarker and Bell (2006) who mentioned that a clutch length comprises 11-21 days, Egg production per clutch was 12-18, incubation of eggs takes 21 days, and for brooding and rearing of chicks a hen spends 70-90 days. Three to five brooding cycles occur annually, lasting an average of 96-122 days was reported by Hossen (2010). Following hatching, the mother hen raises the chicks for up to 63-84 days or resumes egg-laying. Non-Descript Deshi (ND) chickens were to be good egg producers, laying 12.03±0.11 eggs per clutch and 4.15±0.07 clutches annually represented by Jahan et al., (2017); In the study of Das et al., (2008), they stated that the average length of a single clutch was 2-3 weeks or 14–21 days and that every clutch produced 12–17 eggs. According to Islam et al., (2007), the birds of Chandanais produced the most eggs—14.24 eggs per clutch—while the birds of Dhamrai produced the fewest—12.54 eggs per clutch. According to Shahjahan et al., (2011), there were 3.38 clutches on average year, 15.64 egg productions per clutch, and 18.07 days for clutch duration. The reproductive cycle of native chickens in backyard production systems is 20 and 21 for the laying phase and incubation phase, according to Moredaa and Mesekel (2016), which was almost identical to the results of the current study.

In the findings of Demeke (2007), who noted that chick brooding is relevant to the early age (0–8 weeks) of young chicks which were comparatively higher than the present study where they also mentioned that chicks brooding were required for young chicks who were unable to maintain their normal body temperature without the aid of supplementary heat, either naturally occurring from a broody hen or artificially, such as with charcoal, wood, gas, or electricity which supports the present research findings. The reason for the difference between the results and the above findings was that farmers mostly engaged in natural brooding of chicks, and they were unaware of artificial chick brooding techniques.

Key Informant Interviews (KIIs) explains the difficulties in raising Native chickens

a. Low-quality chicks with inadequate productivity

Backyard farming systems were the primary means of raising native breeds of chicken. Though less prolific than other kinds, those birds hardy enough to withstand the harsh climate of Bangladesh. They possessed lower egg production potentiality.

b. Unsatisfactory housing conditions

Majority of farmers reared their chickens with ducks, geese, and other poultry species. A few farmers kept their hens in their home premises during the night without providing them the proper shelter. For native chickens, the housing space allotment and ventilation were inadequate. Due to thieving and predator attacks brought on by poor housing management, they lost their chickens.

c. Ignorance of Native poultry production

The majority of indigenous chicken farmers had limited knowledge and expertise in chicken growing and management techniques. Consequently, this subsector generates little income and low productivity.

d. Inability to get native chicks and hatching eggs

The lack of high-quality chicks from government, non-governmental, and commercial hatcheries was a problem for farmers in Bangladesh. The growth of commercial farms and entrepreneurs was greatly hampered by the lack of high-quality chicks and hatching eggs.

e. Ineffective feeding techniques and increased feed costs

Chickens were given inadequate amounts of feed by farmers. Because feed costs were greater and they lacked feeding management expertise, they failed to give a balanced ration.

f. Disease outbreak and ignorance of biosecurity management

In the local poultry farm, disease outbreaks were frequent. The farm was unaware that Native chickens needed to be dewormed and vaccinated. High chick and native chicken mortality resulted inadequate biosecurity measures to the native chicken farmer's. According to a key information interviewer, inadequate treatment facilities and farmers' unwillingness to cure their native birds were significant problems in the chosen areas.

KIIs Suggestions to Get Over the Obstacles in Native Chicken Farming

- For native chicken farming, sophisticated technology and technological know-how are required.
- Need to grow the improved chicken variety through the genetic improvement of Native chicken.
- Good feeding techniques provide an additional source of balanced nourishment.
- Raising awareness among indigenous chicken farmers on deworming, vaccination, and biosecurity protocols.

- Disease screening and routine observation of both domestic and foreign birds to control new diseases.
- Creating plans (short, medium and long-term) to prevent diseases in native chickens.
- Training is required in native chicken farming, proper housing, and brooding control techniques
- Transformation of native chicken farming into a commercial enterprise through entrepreneurship development.

4. Conclusion

In Bangladesh, home poultry farming serves as a "standby income generator" for the poultry industry, especially during natural catastrophes and when consumer prices for beef and mutton spike too high. Farmers raise native chickens for family consumption and as a secondary source of cash. The majority of farmers raised chickens using a semi-scavenging method and have limited housing options for their native chicken. Farmers often supply feed ingredients from their households, with few purchasing from markets or others farmers. Inadequate practices in brooding, hatching, and chick management negatively impact on native chicken production. Therefore, implementing the systematic and scientific approaches to native chicken farming and awareness development could significantly enhance the production performance and boost the income generation of native chicken farmers.

References:

1. Addisu, H., Hailu, M. and Zewdu, W. (2013). Indigenous Chicken Production System and Breeding Practice in North Wollo, Amhara Region, Ethiopia. Poult Fish Wild Sci., 1:108.

2. Alam, M., Ali, M., Das, N. and Rahman, M. 2014. Present status of rearing backyard poultry in selected areas of Mymensingh district. Bang. J. Anim. Sci., 43, 30-37.

3. Alders, R.G. and Pym, R.A.E. (2009). Village poultry: still important to millions, eight thousand years after domestication. World's Poultry Science Journal, 65, 181-190.

4. Argaw, F.A. (2015). Assessment of Common Practices of Egg Incubation and Chick Brooding of Backyard Poultry Production System in Wolaita Zone, Southern Ethiopia. Journal of Biology, Agriculture and Healthcare. 5(17), 15-22.

5. Bharti, Rita, and Sagar, M. (2020). Production performance of backyard poultry reared by rural women in Budelkhand region of Uttar Pradesh. International journal of livestock research, 8(11), 158-163.

6. Chowdhury, S.D., Ahmed, S. and Hamid, M.A. 2006. Improved feeding of Desi chicken reared in confinement. The Bangladesh Veterinarian 23:29-35.

7. Das, S.C., Chowdhury, S.D., Khatun, M.A., Nishibori, M., Isobe, N. and Yoshimura, Y. (2008). Poultry production profile and expected future projection in Bangladesh. World's Poultry Science Journal, 64 (1), 99–118.

8. Demeke S., 2007 Suitability of homemade hay box chick brooder to the Jimma and Bedele areas of Oromia Region. Livestock Research for Rural Development, 19(1),1-10.

9. Ershad, S.M.E. (2005). Performance of hybrid layers and native hens under farmers` management in a selected area of Bangladesh. Int. J. Poult. Sci, 4, 228-232.

10. Faruque, S., Sarker, N.R., Islam, M.N. and Sarker, M.S.K. (2007). Performance of native chickens under intensive system. J. Bangladesh Agril. Univ. 5(2), 283-288.

11. Goromela, E.H., Kwakkel, R.P., Verstegen, M.W.A, and Katule, A.M. (2006). Strategies to optimize the use of scavenge able feed resource base by smallholders in traditional poultry production systems in Africa: A review, African Journal of Agricultural Research, 1 (3), 91-100.

12. Haunshi, S., Niranjan, M., Shanmugam, M., Padhi, M. K., Reddy, M. R., Sunitha, R., Rajkumar, U., and Panda, A.K. (2011). Characterization of two Indian native chicken breeds for production, egg and semen quality, and welfare traits. Poultry Science, 90, 314-320.

13. Hossen, M.J. (2010). Effect of management intervention on the productivity and profitability of indigenous chickens under rural condition in Bangladesh. Livest. Res. Rural Dev, 22(10), 192.

14. Islam, M.S., Bhuiyan, A.K.F.H., Bhuiyan, M.S.A. and Islam, S.S. (2007). Variability in performance of indigenous chicken. J. Bangladesh Agril. Univ. 5(1), 111-116.

15. Islam, R., Kalita, N., Sapcota, D., Sheikh, I.U., Mahanta, J.D., Sarma, M. (2021). Characterization of Free-range Indigenous Chicken Production System in North-East India (Assam). Journal of Animal Research; 11 (1), 59-70.

16. Jahan, S., Islam, F., Bhuiyan, M.S.A. and Bhuiyan, A.K.F.H. (2017). Productive and reproductive performances of indigenous chicken in the rural condition of Bangladesh. Bang. J. Anim. Sci. 46 (2), 121-127.

17. Khan, M.M.H., Miah, M.Y., Bhuiyan, M.M., Begum, S., Hussain, M.M. and Khanum, R. (2006). The status of homestead poultry production in Sylhet region. International Journal of Poultry Science, 5(11), 1092-1095.

18. Lemma, S., Terefe, T. and Abebe, B. (2019). Assessment of the Prevailing Chicken Egg Storage Materials and Length at Rural Household in Different Agro Ecology of Eastern Ethiopia. Agriculture, Forestry and Fisheries. 8(2), 54-63.

19. Moredaa, E. and Mesekel, K.G. (2016). A Review on Importance of Traditional, Small Scale and Commercial Poultry Production in Ethiopia. British Journal of Poultry Sciences, 5, 01–08.

20. Rahima, Farzana & Jalil, Hossain, M.D., Rahman, M.D. and Shaheenur, M.D. (2023). Management system and productivity of backyard poultry in Jhenidah district of Bangladesh: a survey. Asian Journal of Medical and Biological Research. 9. 1-8.

21. Rawat, S.K., Gupta, R., and Narain, S. (2016). Study on the performance of backyard poultry production reared by rural woman in Mahoba. Indian Research Journal of Extension Education, 15(4), 24-28.

22. Riise, J.C., Permin, A. and Kryger, K.N. (2005). Strategies for developing family poultry production at village level: Experiences from West Africa and Asia. World's Poult. Sci. J. 61, 15-22.

23. Sankhyan, V., Katoch, S., Thakur, Y.P., Dinesh, K., Patial, S. and Bhardwaj, N. (2013). Analysis of characteristics and improvement strategies of rural poultry farming in north western Himalayan state of Himachal Pradesh, India, LRRD Newsletter. 25, (12).

24. Sarker, K. and Bell, J.G. (2006). Potentialities of the indigenous chicken and its role in poverty alleviation and nutrition security for rural households. INFPD Newsletter, 16(2), 112.

25. Sethi, B. (2007). Backyard Poultry in Orissa", Orissa Review January, 48-52.

26. Shahjahan, M., Amin, M.R. and Bhuiyan, A.K.F.H. (2011). Diversity in performance of indigenous chicken in some selected areas of Bangladesh in-situ. Ninth Asia.

27. Shanta, I., Hasnat, M.A., Zeidner, N., Gurley, E., Azziz-Baumgartner, E., Sharker, M., Hossain, E., Khan, S., Haider, N. and Bhuyan, A. (2017). Raising backyard poultry in rural Bangladesh: financial and nutritional benefits, but persistent risky practices. Transboundary and emerging diseases, 64,1454-1464.

28. Shinde, P.K. and Srivastava, N. (2006). Adaptive Research Interventions on Household Poultry: Lessons Learned and Feedback for Further Research. In: Sasidhar, P.V.K. (Ed.). Poultry Research Priorities to 2020, Proceedings of National Seminar, November 2-3, 2006. CARI, Izzatnagar. pp. 239-243.

29. Sonaiya, E.B. (2005). Research, development and outreach in family poultry in Nigeria. Proceedings of 4th International Poultry Show and Seminar, World's Poultry Science Association, Bangladesh Branch, pp. 157-161.

30. Uddin, M.H. (2002). Geographical Distribution, Classification, Characterization and Conservation of Different Native Chicken Varieties of Bangladesh. M.S. thesis, Department of Poultry Science, Bangladesh Agricultural University, Mymensingh.

31. Weyuma, H., Singh, H. and Megersa, M. (2015). Studies on Management Practices and Constraints of Back Yard Chicken Production in Selected Rural Areas of Bishoftu. J Veterinar Sci Technol S12, S12-003.