

**A study on knowledge of biosecurity and waste management
among the farmers in poultry production in Chandanaish
Upazilla, Chattogram, Bangladesh.**



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Abstract

Commercial poultry production in Chandanaish Upazilla, Chattogram is low. The low level of poultry production is improving due to adopting biosecurity measures and modern husbandry practices. A study was conducted among 85 poultry farmers in the Upazilla with the use of questionnaire to assess their knowledge of biosecurity and poultry husbandry. The findings showed that 60.0% of poultry production was rural while the rest were backyard (semi commercial) poultry. About 64.7% of poultry kept were under extensive management. Biosecurity was poor as 92.9% of respondents did not have footbath or hand wash disinfection; 70% would throw away poultry litter in the refuse dump; 12% would use the poultry litter as manure while 11% would sell out the litter. In addition, 64.7% of the poultry farmers obtained their rearing stock from the live bird market and other unknown sources while only 35.3% obtained theirs from the hatchery. The findings of this study showed that the low level of commercial poultry production in Chandanaish Upazilla might be due to the poor husbandry practices undertaken by the farmers. It is recommended that government should train poultry farmers on biosecurity, disease prevention and the adoption of modern husbandry practices suitable for the traditional poultry production system.

Key Words: biosecurity, husbandry practices, poultry

Chapter 1: Introduction

Biosecurity refers to all the management practices aimed at excluding or reducing the potential for the transmission and spread of diseases to animals, humans or an area initially free from the diseases causing agents (Conan *et al.*, 2012). It is a term coined from two words: Bio – life, and Security – protection, with the two main objectives of biosecurity being bio-exclusion and bio-containment (Waage and Mumford, 2007). Either of the two objectives of biosecurity has three components consisting of isolation, containment and sanitation.

Biosecurity is of much importance in poultry production in so much that the FAO based the classification of poultry production systems on the levels of biosecurity (Conan *et al.*, 2012). Strict biosecurity measures in addition to vaccinations, are strategic prevention and control policies adopted to control some contagious poultry diseases as vaccinations alone are not enough to control them under field conditions (Rimi *et al.*, 2017). Good husbandry practices such as adequate feeding, housing and stocking to avoid overcrowding, good ventilation, proper disposal of wastes, cleaning and disinfection of poultry premises help to keep out infections and their spread (Jordan 1990).

Traditionally, based on management, poultry production is grouped into intensive and extensive management systems (Das *et al.*, 2008). The main management criteria used in these groupings are feeding, housing and biosecurity. Under the intensive management system, feeding, housing and other management requirements are adequately provided while feeding and housing are rarely provided under the extensive system (Conan *et al.*, 2012). It is well known that poultry production under extensive management do not receive proper nutrition, suffer from effects of harsh weather and are exposed to various diseases than the intensive system of management (Das *et al.*, 2008).

In Chandanaish Upazilla, commercial poultry production is low, with majority being rural poultry kept under extensive system of management (Sarker *et al.*, 2009).

This study was designed to access the knowledge of biosecurity and poultry husbandry practices in Chandanaish Upazilla, Chattogram, so as to know the causes of the low level of poultry production and prefer solutions to the problems. Primary data were obtained from the retrieved copies of the administered questionnaire to poultry farmers in the Upazilla.

Chapter 2: Materials and methods

The study was carried out in six of the 10 Unions of Chandanaish Upazilla. Three of the six Unions surveyed were those with high volume of poultry production while the other three were those with low volume.

Eighty five (85) copies of a structured questionnaire were administered to respondents who were considered as poultry farmers with follow up interviews. The participants included in the study were Upazilla Livestock Officer, Chandanaish employed by the government, intern doctor, backyard poultry farmers, rural poultry farmers and live bird marketers.

The farmers answered questions on flock ownership, sources of poultry, purpose of rearing, management and production systems used, disease preventive measures in use and methods of handling sick and dead poultry.

Data generated from the retrieved copies of the questionnaire were analyzed using Statistical Package for Social Sciences Version 17 (SPSS Inc. Chicago, IL., USA, 2008) by descriptive statistics to calculate the frequency and percentages, presented in tables and charts.

Chapter 3: Results

The 85 respondents were interviewed by Upazilla Livestock Officer, Chandanaish & an intern Veterinary Doctor. Respondents consist of 32 backyard poultry farmers, 21 rural poultry farmers and 32 live bird marketers. Eighty-five of the respondents represented farmers and live bird marketers that owned chickens directly while the remaining nine (9.6%) respondents did not own chickens but were engaged in healthcare and production activities.

Based on occupation, the 85 respondents that owned chickens were made of 14 (16.5%) civil servants, 23 (27.1%) poultry farmers, 32 (37.6%) live bird marketers, 7 (8.2%) house Wives and 9 (10.6%) students (Table 1).

Ownership of rural poultry was in the hand of children and women with women being more among the live bird marketers than men. In addition, 61.2% of the farmer's sourced chickens for rearing from the live bird markets, 35.3% from hatchery while 3.5% had their chickens given to them as gift (Table 2).

On production systems, 60.0% of poultry produced were rural poultry while 40.0% were backyard poultry (Figure 1 and Table 2). Based on the Unions survey, Borkol had 50% of poultry under backyard (semi commercial) production followed by Dohajari, 41.7% and Kanchabad, 41.2% respectively (Table 2). Equally, Borkol and Dohajari Unions had 40% of poultry under intensive management system while Kanchabad union had the highest percentage, 68.8% of poultry under extensive management system (Table 2). On sources of poultry for rearing, Borkol union is highest in sourcing

poultry from the hatchery while Kanchabad union sourced 66.7% of its poultry from the LIVE BIRD MARKET (Table 2).

However, only 7.1% of the respondents, who were backyard poultry farmers, had footbath or disinfectant for hand washing in their poultry facilities while 92.9% had none (Table 3). Chickens produced under intensive management system were 35.3% while the remaining 64.7% under extensive (free-range) management system were both rural and exotic chickens (Tables 2 and 4). On the assessment of handling of poultry waste, 6 (7.1%) of the respondents would bury the litter; 62 (72.9%) of the respondents would throw them in refuse dump while 17 (20.0%) of the respondents would use them as crop manure (Figure 2).

Occupation of respondents	Backyard poultry (%)	Rural poultry (%)	Live bird market (%)	Total (%)
Farmer	17 (73.9)	6 (26.1)	0 (0.0)	23 (27.1)
Civil servant	14 (100.0)	0 (0.0)	0 (0.0)	14 (16.5)
Marketer	0 (0.0)	0 (0.0)	32 (100.0)	32 (37.6)
Housewife	1 (14.3)	6 (85.7)	0 (0.0)	7 (8.2)
Student	0 (0.0)	9 (100.0)	0 (0.0)	9 (10.6)
Total	32 (37.6)	21 (24.7)	32 (37.6)	85 (100.0)

Table 1: Occupation of respondents and ownership of poultry in different production sectors in Chandanaish Upazilla.

Local Government Area	Production System		Management System		Sources of Birds		
	Backyard (%)	Rural (%)	Extensive (%)	Intensive (%)	Gift (%)	Hatchery (%)	Live bird market (%)
Kanchanabad	7 (41.2)	10 (58.8)	11 (68.8)	5 (31.2)	0 (0.0)	5 (33.3)	10 (66.7)
Zoara	5 (33.3)	10 (66.7)	10 (66.7)	5 (33.3)	1 (6.7)	5 (33.3)	9 (60.0)
Harla	4 (33.3)	8 (66.7)	8 (66.7)	4 (33.3)	1 (10.0)	4 (40.0)	5 (50.0)
Borkol	8 (50.0)	8 (50.0)	9 (60.0)	6 (40.0)	0 (0.0)	6 (42.9)	8 (57.1)
Dohajari	5 (41.7)	7 (58.3)	9 (60.0)	6 (40.0)	0 (0.0)	5 (38.5)	8 (61.5)
Hashimpur	5 (38.5)	8 (61.5)	8 (66.7)	4 (33.3)	1 (7.7)	5 (38.5)	7 (53.8)
Total	34 (40.0)	51 (60.0)	55 (64.7)	30 (35.3)	3 (3.5)	30 (35.3)	52 (61.2)

Table 2: Sources of birds for rearing, production and management systems used by poultry farmers in Chandanaish Upazilla.

Poultry farmer	Hand/Footbath (%)	No hand/footbath (%)	Total (%)
Backyard poultry farmers	6 (18.8)	26 (81.3)	32 (100.0)
Live bird marketers	0 (0.0)	32 (100.0)	32 (100.0)
Rural poultry farmers	0 (0.0)	21 (100.0)	21 (100.0)
Overall	6 (7.1)	79 (92.9)	85 (100.0)

Table 3: The use of hand wash and footbath by backyard, rural poultry farmers and live bird marketers to prevent diseases in poultry facilities in Chandanaish Upazilla

Type of chicken	Management system	
	Extensive /Free-range	Intensive
Broilers	1 (6.3)	15 (93.7)
Cockerels	8 (61.5)	5 (38.5)
Layers	0 (0.0)	13 (100.0)
Rural	43 (100.0)	0 (0.0)
Overall	52 (61.2)	33 (38.8)

Table 4: Type of chickens reared by backyard and rural poultry farmers under different management systems in Chandanaish Upazilla

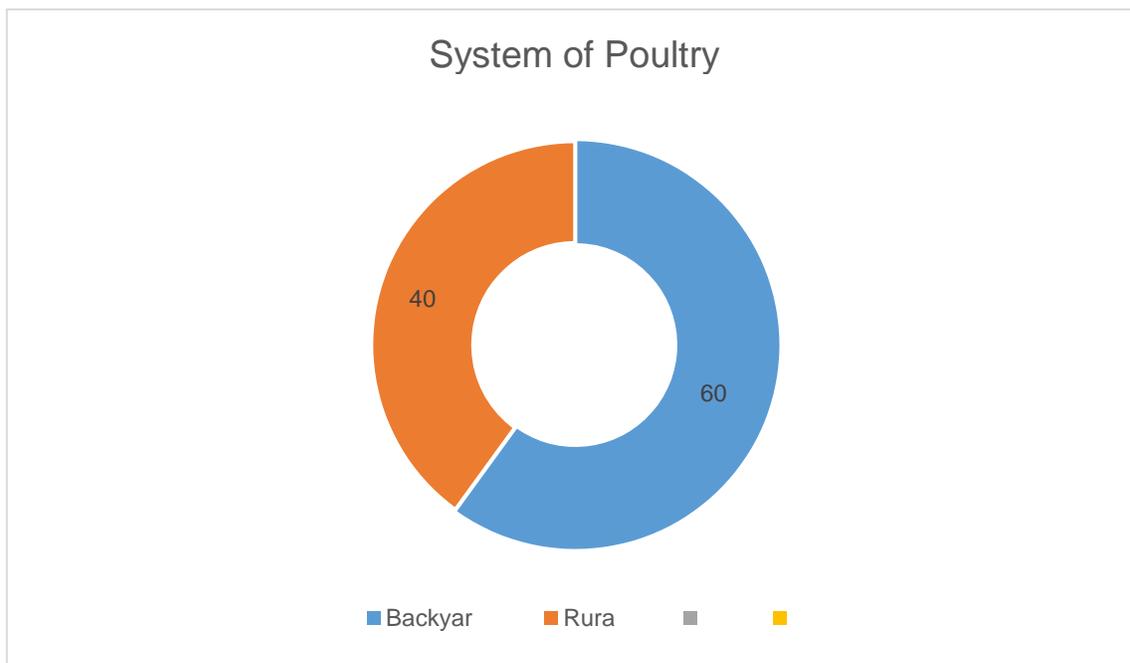


Figure 1: Systems of poultry production being used by farmers in Chandanaish Upazilla.

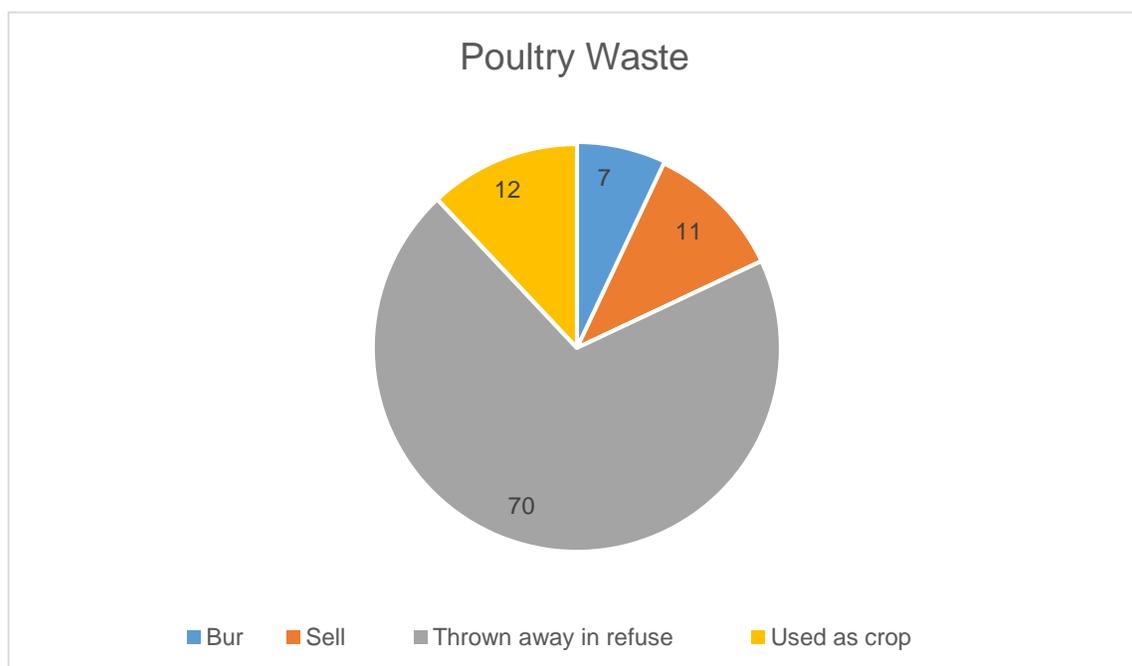


Figure 2: Poultry waste management by producers in the surveyed areas of Chandanaish Upazilla.

Chapter 4: Discussion

Borkol and Dohajari unions have more poultry under backyard production probably due to high commercial activities in the two areas which make commercial poultry production profitable. Dohajari with more economic activities and human traffic than the other areas surveyed. In the same vein, Borkol and Dohajari unions had more poultry under intensive management system and sourced most of their rearing stock from the hatchery probably for similar reasons in addition to the ease of access of poultry farmers to new innovations and information on poultry farming. Awareness campaigns on diseases and agricultural innovations by government agencies are more in urban centres with high media coverage than in rural areas (Rahman and Islam, 1985).

Kanchabad union had the highest percentage of poultry under extensive management system as well as the highest in sourcing birds for rearing from the LIVE BIRD MARKET. This may be due to the structure of poultry producers in this area which may not know the benefits of intensive management over extensive management system. In most parts of Bangladesh, farmers keep poultry for hobby, sacrifice and family use (Das *et al.*, 2008) and not as a commercial enterprise. Hence, the poultry are kept at a subsistence level under extensive management system with little inputs for increased productivity. Equally, the present study indicate the likelihood of flaws in husbandry practices by most poultry farmers that may lead to disease introduction and spread. Bio-exclusion and bio-containment are important components of biosecurity (Ndem and Ogba, 2017) hence, their absence will lead to disease incursion and spread. The actions of poultry farmers in the disposal of poultry waste in the refuse dump as well as being used as crop manure increase the risk of disease spread (Sarker *et al.*, 2009). In addition, sanitation is poor, as greater majority of poultry farmers do not have footbath or hand washing provisions in their poultry facilities. These have serious implications on the spread of contagious poultry diseases by people and vehicles as well as being of public health importance regarding zoonosis such as

HPAI (Biswas *et al.*, 2008). Rural poultry have low productivity either in terms of egg or meat production (Das *et al.*, 2008). This poor yield maybe one of the reasons apart from the effects of diseases why poultry production is low in the Upazilla. However, backyard poultry in this study is considered different from rural poultry because of difference in size, breed of poultry and commercial value. From this study, backyard poultry are mainly of local breed kept for commercial purpose though, in small quantity of 50 – 2,000. This is an indication of transition from the traditional system of rural poultry that are kept for hobby, sacrifice and family use towards a commercial enterprise which should be encouraged. Furthermore, majority of poultry production in the Upazilla is done under extensive management. This finding agrees with previous reports that there are two management systems of poultry production in Bangladesh with the extensive management predominating over the intensive management (Sarker *et al.*, 2009; Conan *et al.* 2012; Das *et al.*, 2008). Poultry under extensive management system are poorly kept in terms of feeding, housing and healthcare (Barua 1997). The end-point of these effects is low productivity arising from myriad causes such as poor nutrition, harsh weather condition, and disease impacts. In conclusion, the production system is mainly traditional, of low productivity and it is associated with some flaws in biosecurity measures and poor husbandry practices. The husbandry practices undertaken by poultry producers fall below standards and account for these noticeable flaws. Equally, it shows that poultry production is still traditional in spite of the concerted efforts to transform it globally into a commercial enterprise to guarantee food security.

It is recommended that government should undertake the training of poultry farmers on the adoption of standard and wholesome husbandry.

Limitations

Sample size is small. The study did not cover the all farmers of Chandanaish Upazilla related to poultry production due to the effect of **Corona Virus**. So actual view of the farmers of the Upazilla may be different. The responses, given by the farmers were not verified whether they are telling the truth or not.

Conclusion

Poultry production in Chandanaish Upazilla is low. One of the main causes of this problem is not having adequate knowledge of **biosecurity**. Also farmers are yet to adopt modern husbandry practices. Government and non-government organization have a few activities in this area. This is also intensifying the problem. It is recommended that government should introduce effective training programme of poultry farmers on the adoption of standard biosecurity measure and modern husbandry method.

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Biography

I am **Md. Rajibul Hasan Rony**, only son of **Abdus Salam Matabbar** and Mrs. **Rashida Begum**. I passed SSC examination in 2011(G.P.A-5.00) followed by HSC examination in 2013 (G.PA-5.00). Now I am an intern veterinarian under the Faculty of Veterinary Medicine in Chittagong Veterinary and Animal Sciences University. In the future I would like to work as a veterinary practitioner.

***Questionnaire on knowledge of biosecurity &
Waste management among the poultry farmers.***

Name:

Address:

Occupation:

Put tick mark (✓) on your answer

- 1. Type of Chicken: Broiler / Layer / Cockerel / Rural.**

- 2. Production System: Backyard poultry / Rural.**

- 3. Management System: Extensive/ Intensive.**

- 4. Source of Bird: Gift / Hatchery / Live bird Market.**

- 5. Adopted Biosecurity Measure: Foot Bath / Hand wash.**

- 6. Social economic status: Rich / Middle class / Poor.**

- 7. Using waste: Bur/ Sell / Thrown away/ as crop.**