



# **AN ASSESSMENT OF POULTRY POLICIES AND GUIDELINES AND STAKEHOLDER PRACTICES: EXPECTATION VS REALITY**

**Syeda Munira Dilshad**

Roll no.: 0121/02

Registration no.: 965

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the degree of Master of Science in Epidemiology**

**Department of Medicine and Surgery**

**Faculty of Veterinary Medicine**

**Chattogram Veterinary and Animal Sciences University,**

**Khulshi, Chattogram-4225, Bangladesh**

**AUGUST 2023**

## **Authorization**

I hereby declare that I am the sole author of the thesis submitted in fulfillment of the requirements for the Degree of Master of Science (MS) in Epidemiology in the Department of Medicine and Surgery, Faculty of Veterinary Medicine, Chattogram Veterinary and Animal Sciences University (CVASU). I authorize CVASU to lend this thesis or to reproduce the thesis by photocopying or by other means, in total or in part, at the request of other institutions or individuals for the purpose of scholarly research.

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**Syeda Munira Dilshad, DVM**

**AUGUST 2023**



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**This is to certify that we have examined the above Master's thesis and have found that it is complete and satisfactory in all respects, and all revisions required by the thesis examination committee have been made**

*Robyn Alders*

---

Supervisor

**Md. Ahasanul Hoque, PhD**

Professor

Department of Medicine and Surgery,  
Faculty of Veterinary Medicine,  
Chattogram Veterinary and Animal  
Sciences University, Khulshi,  
Bangladesh

---

Co-Supervisor

**Robyn Alders, PhD**

Honorary Professor

Development Policy Center,  
Crawford School of Public Policy,  
Australian National University, New  
South Wales, Australia

---

**Chairman of the Examination Committee**

**Professor Pankaj Chakraborty, PhD**

**Head of the Department, Department of Medicine and Surgery,  
Chattogram Veterinary and Animal Sciences University,  
Khulshi, Chittagong-4225, Bangladesh.**

**AUGUST 2023**

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## List of abbreviations

Abbreviations	Elaboration
%	Percentage
<	Less than
/	Or
AMR	Antimicrobial Resistance
AMU	Antimicrobial Usage
APA	Annual Performance Agreement
BBS	Bangladesh Bureau of Statistics
BD	Bangladesh
BDT	Bangladesh Taka
CDIL	Central Disease Investigation Laboratory
CGPA	Cumulative Grade Point Average
COVID-19	Corona Virus Disease
CS	Cultural Sensitivity
CVASU	Chattogram Veterinary and Animal Sciences University
DGDA	Directorate General of Drug Administration
DLS	Department of Livestock Services
DVH	District Veterinary Hospital
DVM	Doctor of Veterinary Medicine
FAO	Food and Agriculture Organization
FIAB	Feed Industries Association Bangladesh
GDP	Gross Domestic Product
HSC	Higher Secondary School Certificate
ICU	Intensive Care Unit
i.e.	Id est (that is)
LDDP	Livestock and Dairy Development Project
LEO	Livestock Extension Officer
LSP	Livestock Service Provider
MS	Master of Science
MS	Microsoft
NGO	Non Government Organization
NID	National Identity Card
PDN	Poultry Production and Distribution Networks
PDR	People's Democratic Republic
PRTC	Poultry Research and Training Center
R & E	Research and Extension
R FDIL	Regional Field Diseases Investigation Laboratory
SALO	Sub Assistant Livestock Officer
SDG	Sustainable Development Goal
SO	Strategic Objective
SOP	Standard Operating Procedure
SSC	Secondary School Certificate
Tk	Taka
TV	Television

ULO	Upazila Livestock Officer
UNDESA	United Nations Department of Economic and Social Affairs
UNO	Upazila Nirbahi Officer
US	United States of America
USD	United States Dollar
UVH	Upazila Veterinary Hospital
VS	Veterinary Surgeon
WHO	World Health Organization

## Summary

Bangladesh's poultry sector has experienced significant expansion in the past few decades and certain policies have been created to offer instructions and directions to stakeholders (farmers, traders, feed dealers, animal health experts, and others involved in poultry production and distribution networks). However, the policies are not well known to many stakeholders and many of those who are aware of the regulations are not adhering to them. In this study, the present state of poultry farmers' awareness of the selective policies was explored in seven upazilas (sub-districts) of Chattogram District. The aim was to provide an insight into the existing policies of poultry sector of Bangladesh and assess key stakeholders' (especially medium-scale exotic broiler and Sonali farmers) knowledge and implementation of these policies. Firstly, a policy review was done on the Animal Disease Act-2005, Fish Feed and Animal Feed Act-2010, Animal Welfare Act-2019 and antimicrobial usage and antimicrobial resistance guidelines in National Drug Policy-2017. A total of 42 men farmers (four broiler and two Sonali farmers per upazila) and the respective Upazila Livestock Officers of the seven upazilas were interviewed in person (four) and via a voice over internet platform (three). A policy awareness program was implemented in eight upazilas incorporated with the farmers' training program. Later, transcription of audio recordings was carried out, translated into English and thematic data analysis was performed. It was discovered that most farmers are unaware of farm registration. Lack of knowledge, a lack of supporting documents, farmers' reluctance to invest money were mentioned as factors to low rate of farm registration. Less than one-third of all farmers were aware of the Fish and Animal Feed Act. Farmers mentioned hearing that growth promoters, meat and bone meal, antimicrobials, and tannery waste were being added to the feed. 80% of farmers were not aware about the Animal Welfare Act. In a developing country like Bangladesh, ensuring animal welfare at the grassroot level is complex. Additionally, it was found that more than 50% of farmers were ignorant of the usage of antimicrobials and the development of antimicrobial resistance. In most cases, farmers only turn to veterinarians as a last resort. Farmers were unaware of the withdrawal period and banned drugs. Increasing awareness of the stakeholders by means of different creative tools and easy to understand guidelines is very important to improve policy compliance.

**Keywords: Poultry, Policy, Awareness, Knowledge, Partnership**

## Chapter 1: Introduction

Bangladesh is the third most urbanized country in South Asia, resulting in a strong concentration of disposable income. As a result, remarkable growth is expected to be seen in the consumption of animal-based food (poultry meat, eggs, beef, milk and fish) for (at least) the next 10 years (Larive-LightCastle, 2020). The United Nations' post-2015 agenda, as expressed in the Sustainable Development Goals (SDGs)- expresses the aim to end hunger, achieve food security and ensure improved nutrition, and promoting sustainable agriculture, with a particular focus on young children, adolescent girls, pregnant and lactating women (UNDESA, 2014). Poultry offers a potential source of high-quality protein and micronutrients to complement cereal-based diets and alleviate seasonal food shortages (de Bruyn et al., 2015).

As a South Asian country, the livestock sector of Bangladesh is endowed with 403 million terrestrial animals, contributing about 1.9% of the gross domestic product (GDP) to the national economy. Among all animal protein meat consumption, 37% of the meat originates from poultry in the country (Hamid et al., 2017). Commercial chicken production is expanding day by day to meet the increasing demand for animal-source food for humans, thereby playing a significantly important role in food value chain. This sector is also contributing to the economy by providing full-time and part-time employment to 20% of people in the country (DLS, 2020).

In many low and middle-income countries, including Bangladesh, small scale producers are the key producers of the commercial poultry sector and they are mostly dealer dependent to buy day-old chicks and poultry feed on credit (Masud et al., 2020). The same dealers also supply and promote using antimicrobials (Masud et al., 2020). Such small-scale commercial broiler farms are more likely to use antimicrobials without veterinary supervision for therapeutic and preventive purposes. In most of the cases, dealers were typically the primary decision-makers for farmers, especially when it came to the use of antimicrobials as a critical component of production cycle risk management (Masud et al., 2020). Sub-optimal antimicrobial prescribing and use are also prevalent in poultry sector as a means of managing risk (Hennessey et al., 2021). Due to the absence of an adequate government animal healthcare system, insufficient monitoring and regulatory services on antibiotic usage and high occurrence of diseases, farm owners mostly depend on informal and unqualified healthcare providers (local

health care providers, drug dealer, animal feed dealer) for the treatment of their animals (Al Amin et al., 2020)

To ensure drug safety, quality and control of drug prices for human health, the Government of Bangladesh formulated the first National Drug Policy in 1982 (DGDA, 2016). In 2023, the Cabinet of Bangladesh passed the Drugs and Cosmetics Act, 2023 recently, banning the sale of antibiotic drugs without a registered doctor's (human and veterinary) prescription with non-compliance resulting in a fine of 20,000 BDT. The law also proposed life time imprisonment and BDT 10 lakh fine as the maximum punishment for manufacturing medicines without registration or for producing fake medicines. The Bangladeshi government passed the "Bangladesh Fish Feed and Animal Feed Act-2010" in order to prevent the use of antimicrobials in animal feed during the manufacturing process (DLS, 2010). Nonetheless, providing broiler chickens drinking water mixed with antibiotics is an informal legal violation often committed by chicken producers. Furthermore, there is inadequate oversight and governance of small-scale farmers (Masud et al., 2020).

There are also some other policies and guidelines for poultry farming, slaughtering and trading in Bangladesh. Such as, Bengal Cruelty to Animals Act, 1920; Animal Disease Act, 2005; Bangladesh Animal and Animal Product Quarantine Act, 2005; National Livestock Development Policy, 2007; National Poultry Development Policy, 2008; Avian Influenza Compensation Strategy and Guidelines, 2008; Bangladesh Zoo Act, 2009; Animals Slaughter and Meat Control Act, 2011; Fish Feed and Animal Feed Act, 2010; National Livestock Extension Policy, 2013; Animal Welfare Act, 2019 etc. However, the main stakeholders (farmers, traders, feed dealers, animal health experts and others involved in poultry production and distribution networks) are unaware or ignorant of these policies and guidelines. Those who have some awareness are generally not practicing or following the policy or guidelines. On the other hand, some clauses of different policies are not much suitable in the Bangladesh context (such as aspects of the biosecurity guidelines). These policies and regulations are currently regulating some components of the poultry production and distribution networks of Bangladesh. Non-compliance, as well as mismatches between policies and their feasibility for implementation on the ground, are causing inefficiencies and increasing risks of infectious disease. Many policies formulated over the past decades are no longer relevant and the new challenges presented by intensification are resulting in few or no

tangible health or any other impactful outcome. Moreover, governance and monitoring of small- to medium-scale chicken farms is weak, thereby making it more difficult to apply the policies in the root level.

This study is therefore proposed to provide an insight into the existing policies of poultry sector of Bangladesh and assess key stakeholders' (especially medium-scale exotic broiler and Sonali farmers) knowledge and implementation (or lack thereof) of these policies. The aim is for this study to help policymakers and animal health experts better understand the current status of poultry farmers in terms of policy compliance and policy awareness.

The specific objectives of the study are to:

- i) To investigate the status of poultry policy compliance and policy awareness among medium-scale exotic broiler and Sonali farmers in Chattogram district.
- ii) To identify the gaps between existing policy and expectations from the perspective of medium-scale exotic broiler and Sonali farmers (2501-5000 birds per farm) regarding the implementation of policies.

The next section provides a literature review on the evolution of the different production system of poultry sector in Bangladesh and the status and gaps of existing policies and guidelines. Then, chapter three will detail the materials and methods of the study following study design, participants, data analysis. The fourth and fifth chapters will cover the results and discussion of the study, respectively. The list of references and appendixes are placed afterwards.

## **Chapter 2: Literature review**

The goal of this chapter was to appreciate past literature and review the findings of previous relevant published and unpublished literature to identify policy gaps and accordingly better understand the current situation in the field. Various published and unpublished literature was obtained by searching online sources like PubMed, Research Gate, Google Scholar as well as through personal communications. This chapter is arranged in a series of sections including a literature review on:

- 2.1. History of different poultry production systems in Bangladesh
- 2.2. Overall promise and challenges of poultry sector
- 2.3. Existing Acts, rules, regulation and standard as well as practices
- 2.4. Any gaps in existing Acts
- 2.5. Policy awareness tools
- 2.6. Summary of the literature review

### **2.1. History of different poultry production systems in Bangladesh**

The poultry industry is one of the most promising sectors providing various opportunities to increase GDP, growth rate and assuring food security. It has turned into a prosperous agricultural industry by impacting the economy by dint of ensuring employment to the youth, creating purchasing power and reducing poverty at a large scale (Islam et al., 2014; Mili et al., 2022). A huge population's regular protein needs and financial support are being met by the rapidly growing poultry farming industry in both rural and urban areas (Islam et al., 2020).

Livestock production systems in Bangladesh (poultry and food-animal) are diversified from household small-scale farms to medium- and large-scale commercial farms (Roess et al., 2015). Mainly broiler, layer, and Sonali (a cross-breed of Rhode Island Red male and Fayoumi female) farms are the core types of intensive farms in the commercial chicken industry (Dolberg et al., 2008; Hennessey et al., 2021). Small- to medium-scale commercial broiler poultry farms, defined as those having <5,000 birds in each batch (Begum et al., 2013), comprise 81% of the commercial poultry sector providing about 78% of the total poultry meat supply in Bangladesh (BBS, 2017). Small-scale broiler



farms are typically traditional open-system broiler houses with natural ventilation, manual feeding and open-sided walls. They are usually built on the land surrounding the homestead with locally available low-cost materials and often rely on family labor (Islam et al., 2010).

However, in recent years, unstable global situation of the feed market has affected the poultry industry of Bangladesh as well. The main constituents of poultry feed are maize and soybean meal. Feed companies are importing maize and soybean to meet the growing demand for feed. Also, feed prices are dependent on several factors including the price of ingredients, electricity and diesel, ocean freight, and foreign exchange rates. Severe inflationary pressure has been seen all over the world since the beginning of the war in Ukraine. As a result, prices of all items have gone up substantially in almost all over the world, including Bangladesh. All of these factors have been played a role in the huge feed price escalation in recent times.

This poultry industry provides 22%-27% of the country's total meat supply (Hamid et al., 2016; Sabuj et al., 2019). Bangladesh has a poultry population of more than 3.64 million, which contributes to the country's GDP (DLS, 2022). Smallholder poultry and dairy farming has great potential due to its scope to provide employment to the rural poor; particularly the most disadvantaged classes of people, i.e., marginal and landless farmers, women, indigenous people.

## **2.2. Overall promise and challenges of the poultry sector**

Poultry farming is one of the key elements of the agricultural economy and is seen as a strategy for reducing poverty in Bangladesh. It serves a variety of roles, including those related to food, nutrition, income, savings, and social and cultural aspects (Rahman et al., 2020). However, as compared to wealthy nations, the average levels of meat and egg intake remain low. Bangladesh has seen a sharp rise in the demand for poultry products as a result of urbanization, lifestyle and dietary changes, low income, and rapid population increase (Rahman et al., 2021).

Despite the potential for growth, some obstacles are preventing Bangladesh from developing its small-scale chicken industry. Unstable markets, high input costs and low product prices, disease outbreaks, or other natural disasters like floods are cited as reasons for the observed drop-out of chicken farms (Jabbar et al., 2011; Islam et al., 2014). Dealers from all over the nation are essential in establishing a connection

between major integrators and small-scale farmers (Mandal et al., 2017). As a result, there is a disruption in direct integration between big businesses and small farms, which raises operating costs. Farmers in the country are unable to offer their goods directly to consumers because of the intricate marketing system (live bird market) (Rahman et al., 2021). Moreover, the incidence of illnesses presents the biggest challenge for commercial chicken growers. Comprehensive animal husbandry practices, such as vaccines and antimicrobial medication, are necessary for commercial chicken production (Roess et al., 2013). Small-scale poultry farms' improper management of chicken raising and biosecurity procedures frequently allow for uncontrollable infectious disease outbreaks that result in financial losses (Parvin et al., 2020). Instability of feed prices is also an important constraint to the poultry industry. Small-scale poultry farming must change in order to meet the issues facing the farmers, and these changes can only be fueled by public investment, government regulations, and increased national and local awareness (Rahman et al., 2021).

### **2.3. Existing acts, rules, regulations and standards as well as practices**

For the comprehensive and sustainable development of the livestock and poultry sector, many rules and regulations have been passed by either the Ministry of Fisheries and Livestock Services or the Department of Livestock Services in Bangladesh over the last 20 years. Some of the most important and key policies of the livestock sector are as follows: i) National Livestock Development Policy, 2007, ii) National Poultry Development Policy, 2008, iii) Animal Disease Act, 2005, iv) Animal Quarantine Act, 2005, v) Animal Disease Rules, 2008, vi) Animal Slaughter and Quality of Meat Control Act, 2011, vii) The Fish Feed and Animal Feed Act, 2010, viii) Animal Feed Rule, 2013 and ix) Animal Welfare Act, 2019 (DLS, 2023).

There were also some key Acts on food safety such as: i) Food Safety Act, 2013, ii) Food Safety (Food-Hygiene) Regulations, 2018, iii) Food-Safety (Contaminants Toxins and Harmful residues) Regulations, 2017, iv) Food Safety (Packed Food Labeling) Regulations, 2017 and v) Food Safety (Sample Collection and Testing) Regulations, 2017 (DLS, 2023).

The aforementioned list of legislations will continue to be updated from time to time in accordance with policy changes and production trends. In any given country, it is the role of a government ministry to develop appropriate policy guidelines for the

development of the sector the ministry is involved in. While constructing the policies, involvement of all stakeholders is necessary.

National Livestock Development Policy was prepared in 2007 to address the key challenges and opportunities and increase the productivity of milk, meat and eggs. This policy was supposed to promote activities to improve income, nutrition, and employment for landless and small farmers, and invites greater participation and investment of the private sector. This policy also provided opportunity and reduces vulnerability and risk in an effort to harness the full potential of the livestock subsector, there by accelerating economic growth for the reduction of rural poverty.

The investment of private sector in the animal health sector remains low and is unlikely to expand in the future, unless provided with adequate policy support and extension services. A comprehensive policy for the livestock sector was launched only in 2005 whose effective implementation and success remains to be seen (Rahman et al., 2014).

#### **2.3.1. Animal Disease Act-2005**

Animal Disease Act-2005 denotes that, every established farm (breeder and commercial) has to be registered. Biosecurity measures, litter management, sick and dead bird disposal, have to be done in a planned way, according to the Act.

According to the DLS, the total number of different registered commercial dairy, beef, buffalo, sheep, goat, broiler, layer, and duck farms throughout the country is presented herewith (Table 2.1). However, there are also a considerable number of commercial farms which are not yet registered.

**Table 2.1:** Registered commercial farms with the Department of Livestock Services (DLS, 2020).

<b>Farm type</b>	<b>Number</b>
Dairy farm	65,834
Beef Fattening Farm	283
Buffalo farm	40
Goat Farm	4,770
Sheep Farm	3872
Layer Farm	20,152
Broiler Farm	56,043
Duck Farm	8,107
Hatchery/ Parent stock farm	248

There are 261 recognized feed mills in Bangladesh, which directly involved with feed production contributing to the economy of the country (Islam et al., 2021). Additionally, thousands of additional individuals benefit indirectly from Bangladesh's expanding chicken feed sector in terms of their way of life.

In the country, the DLS is the main regulatory body to execute the policy directives with Acts and rules for the export and import of livestock and products. Here, there's a livestock office in each upazila and 1–2 registered government veterinarians at each upazila level to provide treatment care.

Different researchers have mentioned the limitations of the livestock sector. The small-scale poultry raisers rely more on the local poultry feed dealers than the government providers, due to their availability outside of office hours and on weekends making them more accessible (Rimi et al., 2018). They were also less expensive and dispensed advice and medication upon request (Rimi et al., 2018). It was also mentioned that, small to medium-scale poultry raisers do not take treatment advice from government veterinarians because government livestock offices were far away from their home and seemed to focus on large animal veterinary medicine more than poultry medicine. Moreover, due to the less attachment of the government officers with the general

farmers, the rate of registration is also low in poultry sector than in large animals (Table 2.1).

Regarding common biosecurity measures followed by the small-scale and medium-scale farmers, as a measure of disinfection, most of farms use spray in the shed and remove feces, which were the only regular cleaning and disinfection activities (Rimi et al., 2017). It was also stated that, future interventions, might investigate the feasibility and effectiveness of low-cost alternative biosecurity strategies (Rimi et al, 2017).

### **2.3.2. Antimicrobial usage and antimicrobial resistance in the livestock sector of Bangladesh**

As a developing country, Bangladesh is vulnerable to developing antimicrobial resistance (AMR). Irrational use of antimicrobials is growing in the livestock production system at the same time as its exploding livestock sector. Different antimicrobials (Colistin, Ciprofloxacin, Tylosin, Neomycin, Amoxicillin, Trimethoprim sulfonamides, Doxycycline, and Tiamulin) represent the most frequently used antimicrobials in each of the eight antimicrobial classes (Polymyxins, Quinolones, Macrolides, Aminoglycosides, Beta-lactams, Tetracyclines, Sulfonamides, and Pleuromutilins) are frequently used on poultry farms in Bangladesh (Imam et al., 2020). Farmers typically self-prescribe antimicrobials or follow recommendations from distributors. A widespread practice among farmers is the use of antimicrobials for preventative measures (Roess et al., 2013; Ferdous et al., 2019; Imam et al., 2020; Masud et al., 2020). Prophylactic or preventive application refers to lowering the chance of disease occurrence, whereas therapeutic application concentrates on treating birds who exhibit clinical signs of an infectious disease (WHO, 2020).

It is of concern that most of the time; these antimicrobials are administered without seeking any prescription from a registered veterinarian (Imam et al., 2020).

The government of Bangladesh has already implemented regulations and laws governing the prudent use of antimicrobial drugs. So far, there are two drug laws, Drugs Act, 1940 and Drugs Control Ordinance, 1982. The government adopted the National Drug Policy in 1982. Later in that year, Drugs (Control) Ordinance, 1982 was promulgated to implement it.

The National Drug Policy ensures easy accessibility to essential drugs with affordable prices, maintain standard quality of drugs and ensure rational use of drugs through

appropriate prescribing and dispensing the health care professionals. The Ordinance controls manufacture, import, distribution, sale, pricing, advertisement of all essential allopathic drugs and medicines and for prohibiting the production, sale and use of non-essential and unnecessary or less necessary drugs and medicines in the country.

Recently, in April 2023, the national cabinet of ministers of Bangladesh passed the “Drugs and Cosmetics Act, 2023” banning the sale of antimicrobial drugs without prescription from a registered medical or veterinary doctor. The customer is to be fined 20,000 BDT if guilty.

Many researchers have studied antimicrobial usage (AMU) and its consequence in the poultry industry. Hassan et al. (2020) stated in their paper that, inappropriate and indiscriminate AMU is leading to the emergence, transmission, and persistence of AMR in the agricultural production system (Hassan et al., 2020). It is also evident that antimicrobial residues in food products have the consequence of developing AMR in humans and animals (Ferdous et al., 2019; Hassan et al., 2021).

It is evident in many studies that, vendors reported dispensing antimicrobials indiscriminately, which might increase AMR (Laxminrayan et al., 2013), providing motivation for calls to reduce irrational antimicrobial use.

A survey in Bangladesh showed only three percent of respondents reported unusual poultry deaths to the relevant authorities, whereas 73% of the respondents did not know how to report poultry deaths and the rest 24% did not think reporting was important (Shanta et al., 2017).

### **2.3.3. Fish and Animal Feed Act-2010**

Bangladesh's poultry sector is valued 4.6 billion US dollars currently (Islam et al., 2021). The local yearly need for poultry feed is about 65 million tons. At present, the feed industry produces 6.3- 6.7 million tons of compound feed annually (Islam et al., 2021). Major feed ingredients e.g., maize, soybean meal, fish meal, corn gluten meal, distillery dried grains with soluble and feed additives.

In 2010, the Fish and Animal Feed Act was passed to provide safe feed to the fish and animals. But the authority is not full-functioning properly due to lack of action plans and monitoring cells. The statute itself has problems with the need for DLS approval to file a case, the severity of the punishment, the kind of bail, the lack of DLS employees'

judicial authority, and the absence of a laboratory for feed and medication analysis. Additionally, there is a lack of legal enforcement for regulating contaminated, dangerous, and expired feed, as well as for maintaining feeding standards and licenses and removing counterfeit labels from bags (Haque et al., 2020). Lack of feed certification authority is also visible (Haque et al., 2020).

#### **2.3.4. Animal Welfare Act-2019**

Animal welfare is becoming a growing concern worldwide. Animal welfare problems are always related to providing inadequate facilities to animals, causing obstruction of animal movement, lack of training of caring personnel, and improper handling. Nowadays, animal welfare problems receive great attention and scientific research activities are increasing (de la Cruz et al., 2018; Alam et al., 2020). To improve the animal welfare condition in Bangladesh, Animal Welfare Act-2019 was passed in the parliament of Bangladesh, replacing the century-old Cruelty to Animals Act-1920. This law significantly increases the punishment for treating animals cruelly and unjustly while still leaving possibility for additional clarification through regulations and gazettes. It also includes a more thorough list of such offenses. With a view to ensuring humane treatment, responsible animal rearing, and prohibiting harsh treatment, the Act was put into effect. The Act's goals include assuring humane treatment of animals, promoting responsible animal raising, and avoiding harsh treatment.

#### **2.4. Limitations and gaps of the rules**

Despite addressing diagnostic facilities in the rules, the scope of diagnosis at the field level is not enough. Diagnostic services are primarily provided by the District Veterinary Hospitals (DVH), Regional Field Disease Investigation Laboratories (R-FDIL) and Central Disease Investigation Laboratory of DLS. However, due to a shortage of skilled manpower and funds, they cannot provide the desired services (Karim et al., 2010).

In Bangladesh, laws, acts, are passed in the parliament. Most of the parliament members being businessman is not able to understand the technicalities of formulating the law. Haque et al. (2020) suggested that, livestock experts may be elected as parliament members and ministers to produce more practical and implementable laws (Haque et al., 2020).

#### **2.4.1. Antimicrobials and antimicrobial resistance**

In many studies, it is well reflected that, there are very few applications of legislation in the country for assessing the competence of prescribing formal and informal medical practitioners. Most drug traders and shop keepers have no formal training in drug handling, transportation, storing, and dispensing and readily sell drugs such as antimicrobials, hormones, and sedatives without prescription (Karim et al., 2010).

On occasion, these feed and medication vendors will change the antimicrobial medications and dosages that have been given by licensed veterinarians. The feed and medication vendors frequently advise the poultry farmers to use antimicrobials since they depend on them for many elements of poultry production. However, the feed and medicine vendors commonly suggest antimicrobial treatments to the farmer without a prescription or any specific understanding of pharmacology, such as dosage, duration, interval, maintaining the withdrawal phase, and residual effects (Lembke et al., 2016). In this way, they violate laws and provide inappropriate suggestions of antimicrobials at the farm level, resulting in an increased AMR burden for the country (Masud et al., 2020).

Despite the fact that there are no symptoms of infection just yet, dealers frequently advise the farmers taking a variety of antimicrobials on a set timetable for the entire flock. To improve the output of their small-scale poultry farming, farmers further take into account the drug dealers directly (Masud et al, 2020).

In other countries, the situation is just the same as Bangladesh. Syhakhang et al. (2001) showed that 73% of women who visited medicine shops, preferred saving money over quality of the drugs in Lao PDR (Syhakhang et al., 2001).

#### **2.4.2. Fish Feed and Animal Feed Act-2010**

The dynamic potential of the emerging poultry sub-sector thus requires critical policy attention. Very few researchers have worked on the existing policy on feed. Some of the gaps in the policies are described. In the Act, there is a definition of the feed control authority. But it is not clear who will do the implementation (Section 3, Fish and Animal Feed Act). In section 10, it is written that the feeding standards and the quality of feed ingredients should be displayed. But questionable thing is, there is still scope of adulterated, polluted, fungal and expiry-dated feed to be sold due to lack of operation



in the field (Haque et al., 2020). In section 11, ensuring the quality of feed is narrated. However, there is still chance of low-quality imported feed ingredients (Haque et al., 2020). In section 12, banning harmful and adulterated feed production, importing, exporting, selling, transporting and marketing are stipulated. But illegal, radioactive, poisonous and irrelevant standardized feed might still be running in the supply chain due to non-cooperation of the port authority. The most important part of the act is section 14, where it is written that, antimicrobials, growth hormones, steroids and insecticide using in animal feed is strictly prohibited. But the unregistered feed mills can hide the real information on production and processing places as they lack in laboratory facilities. Another important point is in section 18, prosecution and cognizance for trial and delivery of justice. The application of the law is done via mobile court where the punishment is given on the spot. So, there might be chance of hurried decisions and misjudgment. Here, Haque et al. (2020) suggested that, judicial magistracy power may be applied in place of existing executive magistrate. Giving special power of the magistrate in imposing a fine (stated in section 21) can result in non-judicial discretionary power, practice and harassment of traders.

It is evident in many studies that, the farmers do not know about the acts. Sixty three percent farmers do not know about the feed act due to a lack of proper steps to create awareness about the feed act (Haque et al., 2020). The same goes for the dealers, 70% of dealers and distributors do not know the Feed Act. Only in the study, it is reflected that, around twelve percent of the government personnel plays to familiarizing the feed act among dealers and distributors. This is quite concerning because field demonstration plays only account for 1.4% and training only accounts for 5.7% of the dissemination of Feed Act.

#### **2.4.3. Animal Welfare Act-2019**

The Animal Welfare Act identifies a number of behaviors that constitute animal cruelty, but it does not limit the list to those behaviors alone; in section 6(2), it provides a pathway for future additions through official gazettes. The current law specifies behaviors like overfeeding, underfeeding, lengthy and pointless restraints, failing to provide medical care, using animals for recreation without a license, using unsuitable animals for reproduction, etc. The restriction of injecting or feeding dangerous and

superfluous medications is an essential addition to the list; this is particularly pertinent given the pervasive practice of treating farm animals with excessive antimicrobials.

The offenses listed in section 6 are punished by up to six months in jail and/or a fine of up to 10,000 BDT, with the exceptions listed in subsection (4). The use of animals in research and academic settings, as well as the sacrifice of animals for religious reasons, are examples of the permitted exceptions. The Act also permits the government to publish gazettes defining the proper methods for animal sacrifice, as stated in section 5 of the same section. Thus, a good balance between religious activities and the requirement to uphold animal welfare standards may be ensured.

Although it isn't stated specifically, the activities they cover imply that section 6 essentially governs how domesticated animals should be treated. The Act, however, also covers penalty for killing a stray animal. It does not just apply to household animals. However, even though the High Court has previously issued directives against it, no explicit mention of cruelty to strays has been made (for instance, dog culling). Along with this, the Act makes crimes like poisoning animals or causing the loss of their organ(s) punishable by up to two years in jail and/or a fine of up to 50,000 BDT.

Additionally, the Act recognizes the use of euthanasia with the advice and written consent of a veterinary surgeon for the painless death of an ill animal. The Act further specifies that registration and formal authorization are required for agricultural operations and, separately, the use of animals for training and demonstration purposes. Moreover, it grants authorized individuals the authority to go to and check any registered or unregistered farms that are under their control, as well as to take the necessary actions in accordance with the Act or its later laws. However, in the absence of any requisite frequency of such inspection, the well-formulated provisions of the Act will remain largely ineffective.

But the application of this Act is still not notable in the field. One of the important reasons is lack of awareness. Most of the stakeholders are not very much aware of the Act due to no advertisement or specific activities for reaching the mass people.

Restricted financial and material resources, inadequate feed supply, restricted access to veterinary services, a lack of proper regulation, and a disregard for the needs of livestock as sentient beings are compromising wellbeing and resulting in cruel treatment in India and Nepal (Acharya et al., 2019; Nayak et al., 2020).

## **2.5. Policy awareness tools**

Many researchers have proposed various tools for increasing the awareness of policies. Findings of some researchers are presented below.

Studies prove that, in a resource-poor country like Bangladesh, backyard poultry farmers are mostly dependent on the local care providers in villages (Rimi et al., 2018). Farmers chose nearby medical professionals or dealers because they sought to save money on travel expenses to government vets. As members of the community, the local care providers were accessible to the villagers and were willing to visit their homes (Rahman et al., 2021).

Due to this, local care providers may be a more reliable source of information and communication for poultry farmers than their government counterparts. They may also help to raise awareness among the farmers and offer them useful advice on how to practice precaution. Due to the fact that these neighborhood healthcare providers are members of the community, including them in communication campaigns may boost community participation, include local viewpoints, empower the community, and lead to a long-lasting improvement in awareness and behavior (Rimi et al., 2017). Because they are the ones that rural raisers turn to for assistance when their birds are ill, neighborhood poultry care providers may thus also Act as a conduit between the government and those raisers.

Educational interventions, including capacity building, training programs for informal healthcare providers/dealers were the most common recommendation by many authors (Sudhinaraset et al., 2013).

Co-operation and mutual understanding between government service providers and local care providers might be a better and effective way (Leonard et al., 1999; Bloom et al., 2011) to increase veterinary service capacity.

## **2.6. Summary of literature review**

This chapter has reviewed existing relevant policies across a variety of contexts and described the current situation of policy compliance in Bangladesh and other countries. The above discussion concludes that there is a huge gap in the field on the application of the policies. It may be concluded that there is lack of an action plan for the implementation of the policy. Very few studies have been done on the status of farm

registration and the constraints of registering. A number of studies on Feed Act and Welfare Act is also not notable. For this reason, this study will increase the insight into the application of the policy at the root level in Bangladesh and the findings are likely to serve as a foundation for future research works.

## **Chapter 3: Materials and methods**

### **3.1. Policy review**

The existing policies of the livestock sector were collected either by personal communication or by downloading from the internet. Firstly, the extracts of the existing policies and guidelines were entered into MS Excel 2020. Among the all policies, four policies were chosen (Animal Disease Act-2005, Animal Feed Act-2010, Animal Welfare Act-2019 and guidelines on AMU and AMR in National Drug Policy-2017) as these policies are well related with the objectives of this research. Then an interview guide was constructed focusing on these four policies.

### **3.2. Study design**

A descriptive qualitative study was conducted (Bernard, 2006).

### **3.3. Study period**

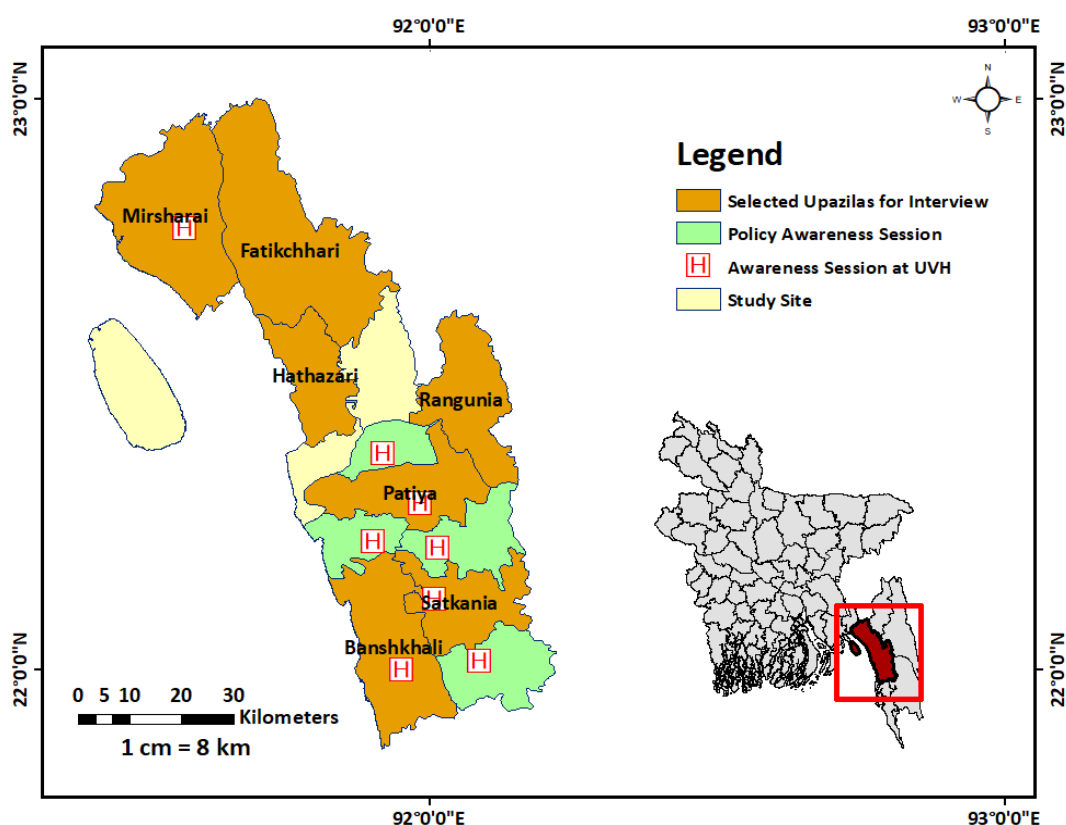
Data collection was performed from January–June, 2022.

### **3.4. Study setting**

Chattogram district, which is located in the south-eastern part of Bangladesh, contributes to a vital role in the country's GDP harboring port, export processing zone and many industries. This district is chosen by considering one of the vital poultry-rearing zones in Bangladesh.

### 3.5. Study area

Seven selected upazilas of Chattogram (Banskhali, Fatikchhari, Rangunia, Patiya, Satkania, Mirsharai, Hathazari) for farmer's interview and the Upazila Livestock Officer's (ULO's) interview and eight upazilas (Anowara, Satkania, Banskhali, Lohagara, Patiya, Boalkhali, Chandanaish, Mirsharai) for the policy awareness sessions (Figure 3.1). These Upazilas were selected based on their distribution in the map to cover all directions (East-West-North-South) of Chattogram district.



**Figure 3.1:** Showing map of seven selected upazilas of Chattogram (For interviews) and the eight Veterinary Hospitals (for the policy awareness sessions).

### 3.6. Interviews

Information was collected from 42 medium-scale (having flock size of 2500-4000) exotic broiler and Sonali farmers (28 broiler and 14 Sonali, all men farmers as in the study area, women farmers with medium-scale poultry farms could not be found) by face-to-face interviews. In each upazila, four broiler and two Sonali farmers were interviewed for the study. These farmers were purposively sampled with the help of the livestock service providers working in each upazila. Both credit (farmers that buy day-

old-chicks, feed on credit from the feed dealer) and non-credit (farmers that buy day-old-chicks, feed on cash from the feed dealer) farmers were interviewed. Additionally, the local government officer of the seven upazilas was also interviewed to learn about their role in terms of policy implementation (face-to-face: four and Zoom platform: three). Interviews were conducted in Bengali generally, in some cases, in Chittagong's local dialect for easy understanding of farmers. Interviews were audio-recorded after taking the consent of each participant.

### 3.7. Developing interview guide

In-depth and key-informant interview guidelines were developed based on the research objectives and relevant literature. The key points of the interview guide are mentioned below and details are given in Appendix-A and B.

**Table 3.1:** Semi-structured interview guide containing questions asked of farmers during interviews.

Topics	Important questions asked to the farmers
Farm registration	<p>Are there any government policies relating to registration of farm? If yes, what are the pre-requisites of farm registration?</p> <p>Is your farm registered? If no, what were the causes?</p>
Animal Feed Act-2010	<p>Are there any government regulations on animal feed? If yes, what does it say?</p>
Animal Welfare Act-2019	<p>Are there any regulations relating to animal welfare? Can it be implemented in the country?</p>
Antimicrobial use guidelines (National Drug Policy-2017)	<p>Are there any rules and regulations on antibiotic usage on animals?</p> <p>What is your usual practice of antimicrobials use?</p>

### **3.8. Ethical approval**

Research ethics (CVASU ethics-CVASU/Dir (R & E) EC/2021/319/1/7) and verbal consent of the participants were ensured before commencing data collection.

### **3.9. Policy awareness session**

A special addition to the study was conducting policy awareness sessions in eight (including four of the studied areas and additional four upazilas) upazilas of Chattogram. The important clauses of the existing four policies and biosecurity guidelines were presented in a story format in five posters. The posters were explained to the farmers in the policy awareness session. Then “**Promises to keep**” session was conducted where the farmers promised to follow the guidelines. Farmers mentioned the challenges and constraints they face while abiding by the rules and policies. Their comments about these policies during those sessions were noted and recorded by the researcher.

### **3.10. Data analysis**

Transcription of audio recordings was carried out and translated into English language. Based on the literature review and research questions, we used a thematic data analysis, which is a systematic approach to data analysis used to analyze classifications. It provides a flexible approach to organizing qualitative data that facilitates the identification and interpretation of patterns and also codes and categorizes data into themes; presents themes (patterns) that relate to the data; illustrates the data in great detail, and deals with diverse subjects via interpretations (Nowell et al., 2017). Transcripts were coded by the fellow researcher and compiled with in MAXQDA software (MAXQDA Plus 2022, version 22.3.0). The recommended steps of the thematic approach were followed, such as data familiarization; generating initial codes; searching for probable themes; reviewing the potential themes; defining and naming the themes and producing the report. The codes were reviewed by supervisors before developing central themes.



## Chapter 4: Results

In the interviews with government veterinarians and the farmers, it was discovered that the majority of farmers are not aware of farm registration. Farmers mentioned about registering farms to receive free vaccines and medications from the UVH, to be given priority in the DLS incentive program, and to obtain bank loans. On the other hand, the process of farm registration was hindered by farmers' unwillingness to spend money, lack of awareness, lack of supporting documentations, and lack of strict action from the DLS. Regarding Fish and Animal Feed Act-2010, it was unknown to more than one-third of farmers in general. Farmers reported receiving information about the addition of growth promoters, meat and bone meal, antimicrobials, and tannery waste to the poultry feed. The government veterinarians mentioned using mobile courts in feed and medicine stores to implement this Act. Regarding Animal Welfare Act, the majority of farmers are ignorant. Regardless of their understanding of animal welfare laws, farmers care deeply about and are acutely aware of the needs of their animals. It was also found that farmers are ignorant of the association between AMU and AMR. The majority of farmers treat the birds themselves, only turning to veterinarians for help in dire circumstances. Furthermore, farmers are not well-known in banned drug and drug withdrawal periods. Training initiatives for the farmers are essential to ensuring judicious use of antimicrobials.

### 4.1. Farmer's view on farm registration

#### 4.1.1. Reasons for not farm registering

1. Lack of awareness

During the face-to-face interviews with farmers, when they were asked about farm registration, more than half of the farmers had not heard about registration in their entire life. Most of the responses were negative.

*“No, I have never heard about this, not even from a single farmer. No one ever told me about the benefits too.” (Banskhali Farmer, Age-45, Male)*

2. Confusion with other legal procedures (Trade license, incentive):

Some of the farmers mistook “farm registration” for a “trade license” from Union Parishad which is needed for the legalization of their poultry business.

*“I did not know that there is a separate registration in the livestock office. I just learned it from you. I thought getting Union Parishad certificate is called registration.” (Satkania farmer, Age-58, Male)*

During the COVID-19 pandemic, the Government of Bangladesh distributed 471 crore BDT incentives to livestock and poultry farmers in two phases during the 2021-2022 period. For the incentive registration program, some basic information about the farmers was collected by the representatives of the Upazila Livestock Office. After that program, many farmers were also confusing COVID-19 incentive registration as farm registration. When asked about farm registration, their reply was –

*“Yes, I am registered. People from the livestock office came to take information for farm registration.” (Fatikchhari farmer, Age-35, Male)*

But after asking probing questions, it was revealed that their farms are not registered. The data collection by the Upazila Livestock Office was for COVID-19 incentive registration.

#### **4.1.2. Reasons for farm registration**

##### **1. Mandatory by law**

Almost one-third of the farmers knew about registration or had some preliminary level of ideas on farm registration though only two of them knew that it is mandatory by law to register their farms.

*“Yes, it is mandatory by law. I do not know the details, but I do know that govt. has made it mandatory.” (Patiya farmer, Age-46, Male)*

##### **2. Good connection with Upazila Livestock Office and Veterinary Hospital**

Farmers who knew well about farm registration, have links or communication with the Upazila Veterinary Hospital (UVH). They were either closely connected with the Livestock Service Providers (LSPs) or with the officers (ULO, VS or LEO).

*“Yes, it is mandatory to do registration. When I go to UVH for any work, they always pressurize me to do registration. X Sir, Y sir always tells me to do registration.” (Banskhali farmer, Age-32, male)*

*“I have visited the UVH several times. They told me to do registration. They also said that they will help me in getting registration.” (Rangunia farmer, Age-28, Male)*

3. Awareness raising through various training activities

The farmers who have done training in the UVH at any time in their life, also knew about farm registration. They have learned about it during the training.

*“I have learned about it during the training in the UVH. Moreover, I also heard from Chittagong Veterinary University. I went there once for training and my birds’ treatment.” (Satkania farmer, Age-55, Male)*

4. Awareness raising through the COVID-19 incentive program

Many of the farmers have learned about farm registration while they went to the UVH for COVID-19 incentive program.

*“A few months ago people from UVH came to different farms for COVID-19 incentive registration. During that time, they said registered farmers will get prioritized in giving incentives. Then I realized that I should have done registration long ago. (Hathazari Farmer, Age-45, Male)”*

5. Awareness raising via neighbouring farmers

Some farmers have also heard about farm registration from other neighbouring farmers.

*“I have heard from other farmers. I know about it. Some farmers from my neighbouring village have done registration” (Hathazari farmer, Age-35, Male)*

6. To avoid confrontation with neighbours

Among the farmers who have knowledge about farm registration, only three of them were registered. Only one of them knew that farm registration is mandatory by law. The reason for his registration was to avoid confrontation with his quarrelsome neighbor regarding bad odour from his poultry farm.

*“Making a poultry farm in the locality brings a lot of problems. Such as, sometimes neighbors complain about the bad odor from the birds. They will form a group to eject your farm. If you have documents from the government, they can do nothing. Similar thing happened to me. My neighbours complained about our farm. But as we were registered, we could able to avoid the collision.” (Patiya Farmer, Age-28, Male)*

#### 7. For installing the electric meter

Another farmer happened to register his farm while applying for electricity pillar and industrial meter.

*“I installed a pillar of electricity (For installing industrial meter) in front of my farm. For that, I was compelled to do registration of my farm. (When I went to the electricity office, they told me that, in order to get an industrial meter, you must get your farm registered) (Mirsharai farmer, Age-56, Male)”*

#### **4.1.3. Probable benefits of farm registration**

##### 1. Priority in incentive program

Those who have knowledge on farm registration were asked about the benefits of farm registration. Most of them answered that registered farmers get prioritized during any incentive program from the government.

*“During COVID-19 outbreak, I applied to the UVH for COVID-19 incentives. On the first try, I did not get it. In the 2<sup>nd</sup> try, they told me to submit certain documents. But still I did not get any incentive. They said the reason is not being a registered farmer.” (Banskhali farmer, Age-40, Male)*

*“A few months ago people from UVH came to different farms for COVID-19 incentive registration. During that time, they said registered farmers will get prioritized in giving incentives. Then I realized that I should have done registration long ago.” (Hathazari farmer, Age-35, Male)*

## 2. Free treatment, vaccine, medicine

Another benefit of farm registration is getting free treatment, medicines or vaccines or any other support from the UVH.

*“They tell us that, they will give some facilities if we do registration. They said they will visit the farm more often and provide treatment. They will give us free medicine etc.” (Banskhali farmer, Age-42, Male)*

## 3. To get bank loans

Another significant benefit of being a registered farmer is getting agricultural loan from any bank of Bangladesh. One of the mandatory pre requisites of getting agricultural loan is farm registration.

*“I also took a loan from Krishi Bank. For taking that loan, I had to register in the livestock office as it was in the terms and conditions.” (Satkania farmer, Age-38, Male)*

### **4.1.4. Barriers to farm registration**

#### 1. Lack of awareness

While exploring the reasons of farmers being non-registered, most of the farmers do not know that there is a process called farm registration and it is mandatory by law. It is the most common answer by the farmers when asked why did not register their farm.

*“First of all, we have to know about farm registration. We need to know what the pre-requisites are. Then we can go for it. If we do not know about it, how can we do farm registration?” (Banskhali farmer, Age-31, Male)*

Having learnt about farm registration and its probable benefits, farmers have also expressed the importance of training program and awareness program on the existing laws.

*“I think government should give training to the farmers so that their awareness increases in such topic. Emphasis should be given in registration. It should also be circulated to the farmers that you cannot*

*make a farm without certificate (Livestock Department's approval). Only then the awareness on this will increase. Now the thing is, most of the farmers start farming without any prior plan or goal. They find someone who has done farming previously, and run the farm by him. 95% farmers are like this. So, it is going nowhere.” (Satkania farmer, Age-40, Male)*

## 2. Lack of documents

Another barrier was assembling and arranging all the documents and submitting it to the UVH, because most of the farmers do not usually have some of the documents or could not manage the document (environment certificate) from the respective department.

*“There's no such lengthy process and hassles as registration.”  
(Mirsharai Farmer, Age-55, Male)*

Another farmer's opinion was -

*“I have heard that if any farm got registered in the livestock office, he might get some benefits if he's in any trouble. But this is kind of tough (To get help from UVH), to get help of 10,000 tk, you have to spent 20,000 tk. So that is why I say, I do not need that 10,000 tk. Suppose, I face loss of 10 lakh tk. In return I get one lakh tk help from govt. if I got the help directly, it would have been better. But the reality is, to get this one lakh tk help, I have to suffer more. That is why I felt no interest in farm registration.” (Mirsharai Farmer, Age-36, Male)*

So clearly mentioned that farmer avoiding farm registration and its subsequent benefit to avoid the hassles involving government processes.

## **4.2. Upazila Livestock Officer's view on farm registration**

When asked about the “Farm Registration”, the ULOs shared their opinions on the reasons for farmers' lack of interest in registration.

#### 4.2.1. Reasons for low registration rate

##### 1. Lack of personnel in the UVH

One of the profound reasons was the lack of personnel in the livestock office for which they cannot arrange programs for farm registration or motivate the farmers for registration in a mass way. One of the comments were like-

*“The first issue is lack of personnel in the livestock dept. That is why we cannot motivate the farmers for registration. There are 18 unions in my upazila. Only 3 SALOs are there for covering 18 unions. The VS is recently transferred to another place. There is only one LEO for such a large upazila. Moreover, I have to remain busy for training. There are almost 6-7 trainings per year. I have to stay busy for preparation of training.” (ULO-1)*

*“To be honest, I have not seen any single awareness program in my UVH in the last 3 years on farm registration. We are not in touch with the rural farmers. This is the reason.” (LEO-2)*

##### 2. Farmers’ lack of knowledge

Another reason for not registration is lack of awareness of the farmers (which is also reflected in the farmers’ interviews).

*“There are some farmers who are very much aware of farm registration. At the same time, there are also some farmers who do not know what farm registration is.” (ULO-3)*

Another opinion was –

*“I think it is due to lack of awareness. When I started my job in 2020, my 16 staff went to different unions and asked the farmers if they are registered. It was circulated that only registered farmers will be part of the program. After that, the rate of registration increased a lot. From this, I have realized that, most of the farmers do not even know about farm registration.” (LEO-2)*

*“To make the farmers understand the benefit of registration, we need manpower. But we do not have that. But the rate of registration of poultry farms is increasing.” (ULO-4)*

### 3. Money

Another reason for farm registration was money. Farmers tend not to spend money for registration. During the farmer interviews, the same opinion was given by the farmers as well.

*“The common nature of Bangladeshi is, they are not willing to pay any money to the govt. They will only want service. So, money is one reason for not getting registered.” (ULO -5)*

Contradictory ideas were also raised regarding awareness of the farmer on farm registration. One of the ULO’s comment was that they (farmers) very much know about farm registration. But they do not want to do it for the sake of money.

*“Actually in our country, we cannot cover the whole population under regulation. Farmers do trade license for their own sake, they know that they cannot run their farm without that. But why they are not doing registration? It is not that they do not know about it. They very much know about farm registration. But they will not do it for the sake of money. They will spend money in other work, but spending 700-1000 tk for registration is too much for them. They say, “Why will I give money? What is my benefit?” but they would not say it in terms of trade license.” (ULO-3)*

### 4. Flexibility of the authority in terms of registration of farms

One of the reasons was flexibility of the Livestock department in terms of registration. So far, the livestock department is not taking hard and fast actions for the non-registered farms. That is why farmers know that they will not face any consequences or trouble for that.

*“Because farmers know, if they do not do registration for the trade license, they will face hassles from the Upazila Nirbahi Officer (UNO)/local chairman etc. But we do not have such person in the root level to do the same thing.” (ULO-3)*

### 5. Lack of documents

Another reason is arranging the documents right (which has been reflected in the farmers’ interview as well). The necessary documents are –



*“For farm registration farmer have to submit National Identity Card (NID), land deed, trade license, document of lease/rent (if rented), plan of the farm etc.” (ULO-1)*

Among the necessary documents, farmers usually have trouble arranging the environment certificate.

*“Environment certificate is an issue for the farmers. The fact is, we say poultry farm is detrimental for our environment. But in reality we are doing so many other things which are much more harmful to the mother nature. Such as making brick fields, raising sand from river banks-these are much more harmful for the nature.” (ULO-1)*

Farmers as well as the ULOs have reportedly said that farmers face trouble while applying for the approval certificate from the environment. It takes lot of hassles to get that. The process is also time-consuming.

*“Sometimes, Dept. of environment create issues regarding farm establishment, does not give approval for farm registration. One of the main reasons for low registration rate is trouble to get environment certificate and all the other documents.”(ULO-6)*

*“If the dept. of environment gives negative report the whole application gets rejected. So, their role is much prominent than ours.” (ULO-7)*

The need to provide land deeds and trade licenses is also the reason for the lack of interest in farm registration.

*“The main problem of the farmer, is the excess number of documents. You have to submit a lot of documents for farm registration. Land deed, trade license these are the factors for which farmers cannot manage those and fail to do registration. Suppose, someone has land on his father’s name, not on his own name. So he cannot manage the land deed. Someone has made the farm on rent. So where will he get the land deed? There is also some fee. If all the documents are not submitted, the application is sent back from the DLS office. It takes 2-2.5 months to complete the whole process of registration. If the documents were less, more farmers would be interested in registration.” (ULO-5)*

*“They sometimes create trouble in giving the clearance.” (ULO-3)*

But some of the livestock officers are showing flexibility in some of the documents. Such as land deed, environment certificate etc. If the farmers have other documents right, environment certificate/land deed is not mandatory to submit.

*“Environment certificate should be taken, but we do not ask for that. I have been working here since 3 years but I have not seen that. In the field, it is not practiced.” (LEO-2)*

*“To reduce this ‘Environment certificate’ problem, now I have decided that if Union Parishad chairman gives approval to any farmer, it will not need any environment certificate.” (ULO-4)*

At the same time, there are also some officers who are not flexible in terms of environment certificate.

*“Usually I am not flexible with environment certificate. I always tell the farmers to submit this. But sometimes farmers bypass me and get registration form the Zila office directly. Such occurrences happen too.” (ULO-3)*

#### 6. Process of registration is time consuming

The process of registration does not take much time if all the documents are submitted. But among the documents, environment certificate takes the most amount of time.

*“Actually we do not take much time to complete the process. The fact is, farmers do not come to the UVH for registration. If they came, they would see how fast I am completing the whole process. There is only one stoppage where is trouble ‘Environment Certificate’. There is scope of negotiation in terms of that from us.” (ULO-3)*

The rate of registration varied between upazilas, ranging from the lowest at 10% and the highest at 40%. The most frequent rate was 10-15%. The following table (Table 4.1) represents the rate of registration and renewal rate of registration in the seven studied upazilas of Chattogram District.

**Table 4.1:** Estimate of the status of registration rate in seven upazilas of Chattogram  
(Derived from interviews of the respective government officers of the seven Upazilas)

Upazila	Rate of farm registration	Renewal rate of registration
Upazila 1	10-15%	5-10%
Upazila 2	15-20%	20-30%
Upazila 3	10%	5%
Upazila 4	7-10%	5%
Upazila 5	5%	5%
Upazila 6	30%	10%
Upazila 7	30%	5%

The registration of the farm has to be renewed every year according to “Animal Disease Act-2005”. The renewal rate among the farmers is very poor.

*“The renewal rate is very poor. Only the large-scale farmers/ persons associated with the poultry association does the renewal. Other than that, no one does renew the registration.” (LEO-2)*

#### **4.2.2. Recent rise in the registration rate**

But recently the rate of registration is rising. One of the reasons is increased relationship between government and the farmers. The bond between them has increased leading to a good relationship between the government officials and the farmers.

*“The reason is, there’s an increase of liaison/relationship between farmer and us. Day by day, interaction between us is increasing. When interaction between two person increases, one is willing to sacrifice for another, this is human psychology.” (ULO-5)*

Government officers usually give priority to the registered farmers in various facilities.

*“We always give priority to registered farmer when it comes to any training, consultancy, vaccine, deworming etc. (that may be one small dose of vaccine or small dose of anthelmintic).” (ULO-5)*

*“Moreover, a huge amount of vaccine comes in our UVH. We mostly give them to the registered farmers. Moreover, the registered farmers are the main beneficiary of our different projects.” (LEO-2)*

COVID-19 incentive program has also played an important role in the rise of farm registration. During the selection of the farmers for giving incentive, there were conditions to be fulfilled. Farmers who fulfill those conditions were told to be prioritized in terms of getting incentive. One of the conditions was being a registered farmer. That is why there have been rise in registration rate. Farmers thinking that getting registration will pave their way to get such incentives in the future.

*“During COVID-19, we got 2.5 crore tk under my project (Livestock and Dairy Development Project-LDDP). So we mainly gave them to the registered farmers as incentive. In the form it was written that registered farmers get priority. The rest went to the normal farmers.” (LEO-2)*

*“After the COVID-19 incentive program, farmers are thinking that they will get money if they do registration. So after that, number of registered farms has increased.” (ULO-1)*

One of the important reasons is to avoid conflict with the neighbors (this was stated above by farmers as well). To avoid such collision, poultry farmers do register their farm so that they have some grounds.

*“These types of incidents are very common in upazila-1. To avoid this, farmers tend to do farm registration. Their thinking is, if their farm is registered, it will not be very easy for others to stop their farm by any cost.” (ULO-1)*

When a farm is registered, it means that it has approval from the government. As a result, many problems can be avoided because of being registered, which is also another reason for farmers' interest in registration.

*“Another scenario is, in upazila-1 there are some forest reserve which is owned by Dept. of Forestry. When your farm is located in the forest areas, it is possessed by forest dept. To avoid this, farmers tend to do registration.” (ULO-1)*

There are also some mischievous reasons for getting farm registration. Such as:

*“There are some cases like- some farmers do registration to get donations from govt. or NGOs. Some do it to evade income tax (as tax rate is lower in agriculture). Some do it to turn black money into white. They are not real*

*farmers. They are the bad people hiding under the veil of ordinary farmers.” (ULO-2)*

*“There is also another aspect in terms of registration. Some people want to show farming as a source of income and hide some other sources of income to evade income tax or pay lower amount of income tax. For that, he does register his farm. On the other hand, if a farmer wants to take loan from the bank, he has to be registered. These two groups of farmers will come to UVH even when not needed.” (ULO-4)*

There are some feed dealers who also have been running farm. They also want to get farm registration certificate.

*“There are also some farmers who are running feed shop with farms. When they get registered, they get some benefits in running the business. It is like, when they have license from DLS, they feel like they have strong backbone.” (LEO-2)*

#### **4.2.3. Farm registration on policy awareness session**

While being asked at the policy awareness session about the farm registration, all but 15 farmers did not know about farm registration before that day. Only 15 farmers among the eight groups had some idea or prior knowledge on farm registration.

During discussion, farmers talked about the barriers for farm registration. One of the important barriers was the registration fee (also stated by the interview of farmers and ULOs), considering that farmers not willing to spend money on that. They wanted registration process to be free at cost from the livestock department. On the contrary, the fee submission is established by law. So, it cannot be denied/defined at any cost.

*Farmers gave their opinion that they want registration free of cost. (Poster and Promise Session, Mirsharai)*

Another profound reason was lack of knowledge or awareness on farm registration, which was also stated in our previous section (Farmers’ interview and ULO’s interview).

Among the barriers for farm registration, lack of manpower was another reason, as same as our previous finding.

*One farmer said that the officers remain busy and cannot give time for registration. (Poster and Promise session, Anowara)*

At the same time, assembling the documents (land deed, environment certificate) is also another point for lack of interest in farm registration-stated by the farmers in the policy awareness session. This also relates to our previous finding in the farmers' interview and ULO's interview.

However, after discussing the probable benefits of farm registration like free vaccines, incentives, training etc., farmers felt motivated to do farm registration and promised to register their farms within short time.

### **4.3. Fish Feed and Animal Feed Act-2010**

#### **4.3.1. Farmers' view on Fish and Animal Feed Act-2010**

Farmers were asked if they have heard about any types of adulteration being used in the feed. Almost one- third of the farmers (13 out of 42) said that they have heard about such incidence of adulteration in their farming life.

*"Yes, I have heard about it. And also seen it. There are some products which some other farmers have suggested me. They told me, 'Feed this to your birds and see the result!' I replied, 'My birds are in good shape, I do not need any additional supplement'. (Mirsharai farmer, Age-55, Male)*

*"Once a farmer asked me, 'What do you use at the last week to gain weight?' from there, I have learnt that some farmers use additives in the last week to gain weight." (Hathazari farmer, Age-50, Male)*

Some farmers have also said about using a particular medicine to gain weight in the last week.

*"Some farmers give Oradexin tablet to gain weight. But I never used this. These are health hazards." (Banskhali Farmer, Age-45, Male)*

*"I have heard that Cataphos medicine increases the weight of the bird. There are also some other additives for gaining more weight. But we do not use any of that." (Banskhali farmer, Age-31, Male)*

When asked about the Animal Feed Act, only one fourth of the total interviewees had basic ideas about it. According to their opinion, there have been adulteration in the feed previously, but for the past few years, such practice has been stopped.

*“Yes, previously there were uses of adulterants in the feed. But the govt. has banned these products and force stopped using these in the feed. So these are no longer used in feed materials.” (Fatikchhari farmer, Age-34, Male)*

*“Previously feed was sold as loose feed. During that time, there scope of addition of such material in the feed. But later, it was stopped due to some law from the govt.” (Patiya Farmer, Age-60, Male)*

Those who knew about the law, learnt that such additive used feed is detrimental for the health.

*“Addition of such material is harmful for the health of birds. That is it was stopped. Now we are having ready feed where there is not much scope of such addition.” (Patiya Farmer, Age-60, Male)*

The use of tannery waste has been banned by the Government, few farmers knew it.

*“Tannery waste and such additives were used in the feed back then. During that time, the weight gain was also higher than today. Then the govt. officers and the doctors had prohibited the use of such additives in the feed. They went to the feed mills and banned such usages. As a result, it stopped.” (Satkania farmer, Age-38, Male)*

*“Once I heard from Somoy News (a particular TV channel of BD) that tannery waste is being added in the feed material.” (Fatikchhari farmer, Age-29, Male)*

Banning of meat and bone meal by the act of this law is also known to a few of the farmers.

*“For the action of this law, using meat and bone meal is now banned to use in the feed. I have seen in news that containers of meat and bone meal were ceased in the port. So after stopping the meat and bone meal, the weight gain has become lessened.” (Satkania farmer, Age-55, Male)*

Another farmer also said,

*“For example, meat and bone meal was previously being used in the feed which was against the Muslim Sharia. Now it has banned.” (Fatikchhari farmer, Age-38, Male)*

*“Adulteration of poultry feed with vulture meat was also reported by one farmer. A few days earlier I was watching TV. There I saw that, in chicken feed and fish feed (imported), they have the adulteration with vulture meat and fat. This very harmful for human as these birds are ultimately consumed by human.” (Patiya farmer, Age-40, Male)*

About adulterating the feed with antimicrobials, one farmer has knowledge on that.

*“But I know that antibiotic addition is restricted in feed.” (Hathazari farmer, Age-60, Male)*

Some farmers also gave opinion that pig offal is banned to be used in the feed recently, which were being used previously.

*“Previously I have heard that pig offal, steroids are being used in there.” (Fatikchhari farmer, Age-38, Male)*

*“Some farmers also use injection to gain weight of the birds.” (Mirsharai farmer, Age- 42, Male)*

Only one of the eleven farmers knew that loose feed selling is prohibited by “Animal Feed Act -2010”.

*“I know that selling loose feed is prohibited. But people do not actually follow it.” (Patiya farmer, Age-46, Male)*

Two third of the total farmers have no idea about any types of addition in the feed or any law regarding this.

*“No there is no such practice. I have never heard about this in my entire life.” (Banskhali farmer, Age-45, Male)*

However, they agreed that such law is a much needed for the well-being of the health of birds and humans.



*“I am not sure, but I feel that this law is very much needed.” (Mirsharai farmer, Age-46, Male)*

*“I have not heard about any such law. But I feel that these laws are needed. Because we can never know what is in the composition in the feed. These birds are eventually consumed by us. So we will be the ultimate losers.” (Patiya farmer, Age-28, Male)*

#### **4.3.2. View of Upazila Livestock Officers on Fish Feed and Animal Feed Act-2010**

The main application of Animal Feed Act lies in the conduction of mobile courts in the feed shop to check the feed quality, storage condition, loose feed selling etc.

*“In terms of the Animal Feed act, it is applied in the field through mobile court.” (ULO-3)*

*“We perform mobile courts at feed shop to check if they are selling loose feed, or any other additives that are harmful for the poultry.” (ULO-5)*

Among the feed shops, ready/retail feed shops are mostly visited by the government officers in the mobile court.

*“We often visit feed shop where they sell ready feed in sealed packets. We do not usually go to loose feed shop (unpacked feed and sell at the rate of small amount).” (ULO-7)*

*“Mobile courts are usually run in the retail feed shops and medicine shop. There is certain target 10-12 per year. But we can cover 4-5 mobile court per year.” (LEO-2)*

The application of mobile court is mostly confined in the feed shops and the medicine shops.

*“But we mostly emphasize on Animal Feed Act-2010. Based on this, we run one or two mobile court (s). These courts are run against the feed dealers or the sellers. We are still not in the condition of running a mobile court against the farmers.” (ULO-5)*

During mobile court activities, quality of the feed and the storage equality is usually checked.

*“We also check the feed quality and the preservation of the feed. In the medicine shop, we see if there is any date expired product.” (ULO-7)*

Mobile court also restrains the probable addition of any adulterants in the feed by dint of Animal Feed Act -2010.

*“Moreover, some people are selling adulterated feed by copying different brand names. These are punishable Acts by law. We are trying our best to prevent such wrong doers.” (ULO-1)*

But the condition and the quality of the feed has increased than before.

*“But now the condition has improved. Now all the feed companies are registered and maintain a standard protocol. So the condition has improved.” (ULO-5)*

The feed mills are visited by the DLS officials once in per month to as a part of their quality control part.

*“There is an Annual Performance Agreement (APA) program from the DLS regarding visiting the feed mill. They send the sample in the PRTC, our government officers visit the mill, analyze the report, see the production process etc. After seeing all of these, they give a certificate. If the certificate is not satisfactory, the company cannot market their feed. It is the liability of the UVH, upazila-2.” (LEO-2)*

But rural areas are still out of the supervision of the DLS. That is why rural farmers often buy loose feed from the shops.

*“But in the rural level, loose feed is being sold. Upazila-2 is a large upazila, we do not have the capacity to cover such a big area. Moreover, there are some farmers who have 50 chickens or 100 chickens, he cannot buy the whole sack. He has to buy loose feed. So company sells in big packets, but the retail shopkeepers are selling it in one to two kg pack. As a result there is chance of deterioration of the quality of the feed. We do routine visit, but we cannot reach to the remote level.” (LEO-2)*

Lack of manpower is acting as a profound reason to not reach to the remote farmers by DLS.

*“The implication of these laws depends on manpower. Our main problem is manpower. All the officers of UVH are very busy with their own official responsibilities. Logistic support is very weak in here. So we cannot actively take action in enforcement of these laws.” (ULO-4)*

#### **4.3.3. Policy awareness session on Fish and Animal Feed Act-2010**

When discussing about Animal Feed Act and its application in the policy awareness session, farmers stated that they were not aware of this law. However, they restrain from using any types of additives or medicines to increase the weight. Only six farmers complained about such addition or hearing about such additives (tannery waste, pig offal, growth promoter) in the feed.

Farmers’ demand was to increase the monitoring on the feed mills by DLS to avoid such addition in the feed and ensure safe feed. Another opinion was to check on the dealers and the dealer shop frequently to restrain any loose feed selling, poor storage condition etc.

During the promise session, farmers promised that they will provide safe, additive free feed to their birds and become more careful in choosing the good quality feed for their birds.

#### **4.4. Animal Welfare Act-2019**

##### **4.4.1. Farmers’ view on Animal Welfare Act-2019**

When asked about Animal Welfare Act, 34 out of 42 farmers had no idea about any such law in Bangladesh.

*“I have not got any specific instructions or have not heard about any law.”  
(Mirsharai farmer, Age-55, Male)*

Farmers also think that thinking about animal welfare in Bangladesh is nothing but a day dream.

*“I do not think there is any law for that. This is Bangladesh. There is no justice for human, so how can there be justice for animal being?” (Mirsharai farmer, Age-35, Male)*

*“No I have not heard anything like this. But I do not think this type of law will ever be implicated in Bangladesh. Where there is no law (or less compliance of law) for human, then how can be there’s law for animals? Money is the law in Bangladesh.” (Fatikchhari farmer, Age-30, Male)*

However, farmers are cordial towards their animals and sincere about taking care of the birds.

*“Yes of course, I do believe that this type of laws exist internationally. But in our country I do not think it is in action. But as a Muslim, it is prohibited in Quran even to give pain to an ant. Giving pain or killing an animal is considered a sin in Islam.” (Fatikchhari farmer, Age-49, Male)*

*“I have not heard about it. But such law will be beneficiary to the birds’ welfare as well as farmers’ welfare.” (Banskhali farmer, Age-45, Male)*

*“No, I have never heard about any such laws. It is true that, we feel bad when we see such things happen. So we try to prevent the occurrence of such incident. But I have never heard about any laws of animal welfare.” (Fatikchhari farmer, Age-38, Male)*

Some farmers have become aware of animal welfare from TV or social media.

*“I have seen some posts in the social media regarding this. But in reality I have never seen anyone being punished for any types of cruelty against animals. I did not even see anyone to give any explanation to the police after doing wrong towards animals. In my farm, I always try to give optimum amount of space to the birds.” (Rangunia Farmer, Age-20, Male)*

*“I have not got any specific instructions or have not heard about any law. But in TV, I have seen protests going on against the cruelty towards animals. I have seen movements going on for animal rights in TV. From this I have learnt that giving pain towards animal is a punishable crime.” (Rangunia farmer, Age-38, Male)*

While asked about Animal Welfare Act, one fifth of the total participants (eight out of 42) farmers said that they have knowledge on the existence of such a law.

*“Yes. It is a punishable crime. Torturing any types of animals (that maybe bird or dog cat or anything else). But this law is not practiced. People do not follow/abide by the law. Not all people are of same mentality.” (Satkania farmer, Age-45, Male)*

However, there is still question how much this law is implicated in the field.

*“Yes, I have heard that there is a law for conservation of animals. But I do not think there is any application, because I have never heard of any incidences like someone is getting punished for his mischievous deed towards animal.” (Satkania farmer, Age-45, Male)*

*“I think there is law for that. But I do not think its presence creating any difference to the current practice. It is not being implemented.” (Patiya farmer, Age-25, Male)*

In some cases, the socio-economic status of Bangladesh does not support such welfare practices for animals.

*“In our society, 90% of the laws are not being practiced (which are laws for the welfare of human). The case is even tougher in animal. Suppose, while transporting the birds, my allotted time is 1.5 hours. If I take the birds gently or one by one it will take 7-8 hours. But I cannot let it happen. That is why I am telling that abiding this law is very tough.” (Mirsharai farmer, Age-43, Male)*

However, the farmers are very much sensitive towards their animals regardless of the existence of the law because of their love and affection towards the animals.

*“If any vehicle owners maltreat any of my birds, I take care of him. I would not give birds to him. I even scolded my staff not to mistreat any birds. They are ought to handle birds with care and affection. These birds are my Rizik (Arabic word: meaning my way of income). So torturing them is equal to hampering my Rizik.” (Mirsharai farmer, Age-48, Male)*

#### **4.4.2. Views of Upazila Livestock Officers on Animal Welfare Act-2019**

When asked about Animal Welfare Act and its implication in the field, ULOs have admitted that there is still a lot of room to work on in this context.

*“We still could not force this Animal Welfare Act that well. You know the situation of Bangladesh. Now we are still in the awareness stage. We still have not reached that level to force them follow this law.” (ULO-3)*

*“I still believe that there is a lot of room for work in this regard.” (LEO-2)*

Livestock officers have also showed concern on the lack of welfare of the animals in the field.

*“Regarding welfare issue, let me tell you an incident. In my upazila, there’s a place called 11 mile. In the place, the seller will feed two or three liters of water forcefully to his goats just to increase the weight. As a result, the weight will increase four to five kg. If its previous price was eight thousand, the new price will be 12 thousand. So this is the so called ‘Animal Welfare in Bangladesh’. This practice is also happening in cattle before selling.” (ULO-5)*

When any situation arrives that threatens the welfare of the animals, ULOs have tried to mitigate the situation by making aware of Act.

*“Once in the monthly meeting, it was raised from the union parisad that we should kill the street dogs. But then I convinced them saying that they are also important for the environment balance. It will also be considered as a crime under Animal Welfare Act. We can do vaccination of the street dogs so that they cannot create any issues of zoonotic disease.” (ULO-7)*

*“A few days earlier, we were giving training to the slaughter house personnel. There I told them to not do any inhuman practice to the animals, specially to the street dogs. It is the most common inhuman practice-killing the street dogs. We have discouraged them to do any such practice and also let them know about the Animal Welfare Act. They are the natural cleaner.” (ULO-5)*

The lack of manpower is one of the reasons for which awareness by farmers of these law is still very poor.

*“The implication of these laws depends on manpower. Our main problem is manpower. All the officers of UVH are very busy with their own official responsibilities. Logistic support is very weak in here. So we cannot actively take action in enforcement of these laws.” (ULO-1)*

*“So if I am ought to maintain welfare, I need more manpower.” (ULO-4)*

#### **4.4.3. Policy awareness session on Animal Welfare Act-2019**

While discussing about the Animal Welfare Act, only two groups of farmers knew about the Act. The rest were unaware of the Act.

Despite being unaware, farmers were well concerned about the wellbeing of their chickens. Farmers were also concerned about the traders who handle the birds in a mischievous way while transporting them from farm to van. According to their opinion, this is also another reason for breaching of animal welfare.

At the promise session, farmers promised that they will tell their family and their staff about this Act and make them more aware about the welfare of the animals.

#### **4.5. Antimicrobials, antimicrobial usage and antimicrobial resistance**

##### **4.5.1. Farmer’s’ knowledge of antimicrobials, antimicrobial usage and antimicrobial resistance**

When asked about any government rules and guidelines on antimicrobial use, 33 of 42 farmers said that they have no idea about any such rules.

*“No I have not reached any such notice or guideline. If there were any, I would have heard about it.” (Patiya farmer, Age-18, Male)*

However, they have got the suggestion from the veterinarians to not misuse the existing antimicrobials.

*“No there is no such thing. But when we go for advice to any govt. doctors, they always tell me that try to rear birds without antibiotics. They always give this advice.” (Rangunia farmer, Age-35, Male)*

Another farmer pointed lack of training to be the reason of not knowing such guidelines from the govt.

*“No I do not know if there is any such guideline. The point is, I have not received any training. If I received one training, my knowledge in this regard would have been much better.” (Hathazari farmer, Age-30, Male)*

Another farmer also expressed his view regarding AMU, their economic benefit is restraining their ability to follow the government guideline about antimicrobials.

*“I do not care what government says about antibiotics. Government will not give me money when I face loss. So why would I care about government’s guideline.” (Satkania farmer, Age-38, Male)*

While being unaware about the government rules on AMU, farmers have been noticing that some of the previously used antimicrobials are not being found at the medicine shop (as they are already banned).

*“No there is no particular rule. But I have seen that some medicines are not there which we used previously. The shop owners do not keep medicines in their shops, as a result we cannot get access to them (Mirsharai farmer, Age 27, Male)*

It is also questionable how many farmers will abide by the government guidelines on antimicrobials.

*“No I have not reached any such news. I also think that if there’s any such law, it is almost impossible to convince the farmers to follow that” (Patiya farmer, Age-28, Male)*

On the contrary, nine of 42 farmers are aware of the government guideline on AMU and AMR.

*“Yes, there is instruction from the government regarding which antibiotic can be used and what cannot be used in animals.” (Hathazari farmer, Age-35, Male)*

*“I have heard in the news that antibiotic use is prohibited. It is also prohibited in human without doctor’s prescription. You cannot even sell those except prescription.” (Mirsharai farmer, Age-55, Male)*

Regarding the indiscriminate use of antimicrobials, most of the farmers use antimicrobials on their own upon arrival of a disease outbreak.

*“Most of the time I try to resolve the situation on my own. When I cannot resolve the situation, I consult with the dealer or medicine shop owners. Then they call doctors.” (Mirsharai farmer, Age-35, Male)*

*“Yes, I use antibiotics on my own. I do not call X sir all the time. Firstly I will try to resolve the situation myself.” (Banskhali Farmer, Age-45, Male)*



Some farmers have their own course/schedule of antimicrobials to be used as preventive purpose.

*“I use cefa-1 during the first few days to cure naval. Then no antibiotics is given until 10-12 days. In the 17-18<sup>th</sup> day, we give Coccidistat medicine dose. During that time, if there is any cold occurrence, then I give Levofloxacin.” (Banskhali farmer, Age-45, Male)*

Doctors have also taken it as granted that farmers would use some antimicrobials before his visit to the farm.

*“Whenever any doctor comes, the first question they ask, ‘What medicine have you already used? Give me the names.’ He takes it very normally that I have already used many antibiotics.” (Patiya farmer, Age-50, Male)*

Some farmers (three out of 42) also prefer taking advice from neighbouring farmer or any friend farmer on the treatment.

*“I do not call doctor. My partner is a very experienced person. He understands everything (meaning what is happening to the birds). He is involved with poultry farming from 17-18 years (since childhood). So he decides what medicine to give in the diseased flock.” (Rangunia farmer, Age-26, Male)*

*“When I face any issues with my birds, I consult with my friend who is also an experienced farmer.” (Satkania farmer, Age-58, Male)*

Likewise, some of the farmers (three out of 42) also take advice from the medicine shop or the dealer shop according to their advice.

*“I consult with other farmers or with the shop owners. If the condition is very serious, I consult with the man from who I have bought the birds (feed dealer). Whatever he says, I do it accordingly. When he is not available, I consult with the medicine shop. Then he tells me what medicines to give to my birds.”(Satkania farmer, Age-58, Male)*

*“I firstly try to resolve the situation. When I cannot resolve the situation, I consult with the dealer or medicine shop owners.” (Mirsharai farmer, Age-35, Male)*

When farmers fail to treat the birds by their effort or their friend/dealers' effort, they go to the doctor.

*“When I or my friend fails to control the situation, then I go to the doctor. I consult with doctors from Square, Acme Company and then give treatment according to their advice.” (Fatikchhari farmer, Age-38, Male)*

*“When the condition becomes worse, getting out of my hand, I then call the dealer. Then dealer will call doctor and give medicine.” (Patiya farmer, Age-18, Male)*

On the other hand, there are also some farmers (20 out of 42 farmers), who are very much concerned and strict to doctor's advice.

*“I call the doctor for the slightest of abnormality in the birds. Even in dullness, depression I consult the doctor. I do not use antibiotics on my own.” (Hathazari farmer, Age-21, Male)*

*“Before giving any medicine, I will ask the doctor. I never use any medicine on my own. The doctors will do post mortem and then prescribe medicine.” (Banskhali farmer, Age-45, Male)*

Seventeen out of 42 farmers knew that antimicrobials have some level of bad effects. The probable effects are lessening the weight.

*“Antibiotics lessen the weight of the bird. So if I use less antibiotic in a batch, the weight comes good in that batch.” (Mirsharai farmer, Age-38, Male)*

*“It creases the cost in the farm. Also, it lessens the weight of the birds. The birds become dull and depresses during the course of antibiotics.” (Hathazari farmer, Age-30, Male)*

Other side effects of antimicrobials were kidney, liver damage etc.

*“I have heard that antibiotics treated birds cause cancer in human. That is why we should avoid antibiotics.” (Hathazari farmer, Age-50, Male)*

*“If we use excess antibiotics, it will create harm in human. Specially Colistin and such antibiotics. It may damage the kidney.” (Banskhali farmer, Age-31, Male)*

One of the major problems of AMU is inactivation of the good bacteria as well as the bad ones.

*“Antibiotics kills all types of bacteria. In the body there are good bacteria as well. Antibiotics kill the good bacteria also, which is not good for body.”*  
(Banskhali farmer, Age-31, Male)

Some farmers are also known to the fact that antimicrobials will cause bad health effects to the human body as well.

*“Antibiotic is not good for human body. Suppose I am giving antibiotics to the birds and the bird is growing faster and gaining more weight. This antibiotic treated bird will ultimately affect human health. So why do I do something that is harmful to humans?”* (Banskhali farmer, Age-42, Male)

*“Antibiotic is being used vigorously in the chicken. In another word, birds are grown on antibiotics. I believe it is harmful for the human kind. The birds which are reared on antibiotics will not last long than the one without antibiotic. (He is meaning that, antibiotic treated birds are much weaker than the birds that are naturally reared). Those birds will be loose even at the slightest change of the temperature.”* (Patiya farmer, Age-14, Male)

20 out of 42 farmers reported using antimicrobials judiciously. They are well aware of the possible problems with antimicrobials and its consequences.

*“I always try not to use antibiotics in normal condition. Previously we used more amount of antibiotics. But recently the doctors are becoming very conscious about antibiotic use. My doctor has told me not to use antibiotic in normal /healthy state. That is why I always try to be careful in antibiotic use.”*  
(Mirsharai farmer, Age-56, Male)

*“I think, antibiotic should not be used in healthy birds. It should only be used when necessary, when the birds are sick. I also follow this rule for me too. I even do not consume the medicine of gastritis without need.”* (Rangunia farmer, Age-20, Male)

Farmer should focus on good management rather than more antimicrobial drug for their economic and health benefits.

*“I think antibiotics are bad. You should not use antibiotics unless the problem  
Suppose you have ammonia gas accumulated in your farm. You are not taking  
your curtains up, your birds will have respiratory problem. You cannot solve  
this issue with antibiotics. So what am I trying to say is, antibiotics cannot solve  
all of your problems. Most of the farms’ problem is faulty management.”  
(Rangunia farmer, Age-35, Male)*

When asked about banned antimicrobials, 15 out of 42 farmers knew that there are some antimicrobials (i.e., Colistin, combined drugs) are banned from the government.

*“Govt. has banned Colistin and such type of drugs. Sulphadiazine (combined  
sulpha drug), Azithromycin cannot be used in animals or birds. Moreover, high  
power antibiotics should not be used in birds.” (Fatikchhari farmer, Age-45,  
Male)*

*“There are some medicines which are banned for animal use, but can be used  
in human (Such as, Amoxicillin). But farmers buy it from human medicine shop  
and been using it in their farm. Some medicines are banned for local farmers,  
but can be used in hatcheries. Some medicines are sold in large amount in 5  
litre pack (he was talking about Colistin), farmers buy it as 100ml pack after  
dividing the 5 litre pack in places like Hazarigoli”. (Fatikchhari farmer, Age-  
43, Male)*

*“About antibiotics and its use, I have heard that there is a certain antibiotic  
which are given in ICU of human hospital. That antibiotic was previously given  
in birds. But now it is completely restricted to use in chickens. Otherwise, it  
would not work in human being.” (Hathazari farmer, Age-60, Male)*

The rest of the farmers (27 out of 42) were unaware of any such banned antimicrobials.

*“I do not know about it.” (Satkania farmer, Age-58, Male)*

#### **4.5.2. Antimicrobial resistance**

When asked about AMR, ten out of 42 farmers had some basic knowledge on it.

*“About human consequences, when a person eats chicken that has been fed  
antibiotics, these antibiotics will enter into the human body after consumption.  
Then that human being will be habituated to that particular antibiotics and the*

*germs will get adjusted with the antibiotics. As a result, it will not work against the bacteria. That is why, our priority is rearing the birds without antibiotic. I have learnt these things from Facebook and other sources.” (Fatikchhari farmer, Age-39, Male)*

*“The antibiotics which being used in human (shared antibiotics) should not be used in animal. It can create antibiotics resistance. We can check the resistance via different tests (he meant cultural sensitivity/CS testing). I know this fact because one of my family member undergone with this situation. From this I have learnt about AMR.” (Hathazari farmer, Age-60, Male)*

The rest (32 out of 42) farmers are unaware of AMR.

*“No, it does not create any harm. Doctors have invented antibiotic for the benefit of mankind. Why it will create harm?” (Satkania farmer, Age-38, Male)*

*“No there is no bad effect of antibiotics on human.” (Fatikchhari farmer, Age-49, Male)*

#### **4.5.3. Withdrawal period**

About withdrawal period, twelve out of 42 farmers had idea on withdrawal period.

*“When you see the label of any medicine, it is written that ‘You should not consume this for 10-14 days’. In that case, I sell the birds 8-10 days after the completion of antibiotic course. Otherwise, it will go to human body and create problem.” (Hathazari farmer, Age-35, Male)*

*“I have heard that, after antibiotics treatment, that bird cannot be eaten within six days. After passing six days, you can eat this. That is why it is told to not use antibiotics in the last week of rearing.” (Hathazari farmer, Age-60, Male)*

*“Antibiotic is not good for poultry. Suppose I have given antibiotics around the time of sell. It will remain in the body as it did not get time to come out of the body. It will enter the food chain. Eventually it will end up in our plate. As a result, we are facing more disease.” (Mirsharai farmer, Age-49, Male)*

#### **4.5.4. Views of Upazila Livestock Officers on antimicrobials**

The Upazila Livestock Officers arrange training on AMR on regular interval to make the farmers aware of the bad effects of antimicrobials and its consequences.

*“Yes we do talk about AMR in each and every training because it is a major issue. From our LDDP project, every officer and staff are trained under this project on AMR.” (LEO-2)*

*“In the monthly meeting of the UVH we always run a session on AMR. In every other program, we always incorporate a small session on antibiotic use and its problem.” (ULO-7)*

One suggestion from the upazila office is to make the farmers as well the general public of AMR.

*“I think AMR training should be done in two ways. One is for general people. They think that they will die if they eat broiler. So we have to train both the common people as well as the farmers. Then the market will be in good shape.” (LEO-2)*

Farmers see UVH as tertiary helpers, whereas feed dealers are their first option, which might be a reason for the farmers to have less knowledge on AMR.

*“To the farmers, we are the tertiary helpers. The firstly go to the medicine shop, or discuss with the neighbouring farmer or quack doctor. When all of them fails, then they will come to us.” (ULO-3)*

*“Farmers do not usually come to UVH for advice. They will take advice from the dealers or the company doctors.” (ULO-4)*

The use of banned drugs has been reduced than previously according to the government officers.

*“I believe, the use of Colistin has been reduced. This is one success of govt. Colistin is now not available in 100 ml pack. It is sold in one litre pack. As a result, root level farmers have stopped using Colistin, though the large-scale farmers are still using it. In the last six months, I have not found Colistin use in small to medium scale farmers.” (LEO-2)*

*“I think the use of banned drug has reduced up to 90%, only 10% is still at the market. The use of Colistin, Nitrofurantoin has decreased to almost zero, hope that this rate continues.” (ULO-6)*

One possible way to restrain the easy access of antimicrobials is to limit the sources of it.

*“In case of antibiotics, we also have to establish such check points. After constructing the check points, we have to crosscheck the entry of antibiotics and explore the probable ways of their ending up in the farm. So we have to work on the probable sources of antibiotics-where farm can get access. If we can stop the sources, it will be easier for us to change the antibiotic scenario. By regular checking we can reduce the use of antibiotics.” (ULO-7)*

Another option is to train the quacks as well as the farmers on the AMR.

*“Besides making the farmers aware, we also need to work on the feed dealers or the local veterinary care providers. For this, we also need to train them as well.” (ULO-7)*

*“If we can train the local veterinary care providers regarding AMR, it would bring great impact. Though I am very much aware of the fact that they neither have any legal right to do training or prescribe antibiotics. But we can give training as a farmer.” (LEO-2)*

In spite existence of law on buying, selling of antimicrobials, it is mostly not followed in the country.

*“There is a law for not using antibiotics in the feed, not buying antibiotics without prescription etc. But hardly any application of these laws.” (ULO-4)*

The fact is there is still a lot of awareness programs are needed to make the farmers aware of the laws and guidelines on AMU.

*“My last say is, we are still on the awareness level, we can be strict with the laws after all farmers are aware of this.” (ULO-5)*

#### **4.5.5. Policy awareness session on antimicrobial usage and antimicrobial resistance**

Among all the farmers, only four farmers knew the meaning of AMR. The rest were unaware of the fact.

Upon discussion, it was found that farmers were using antimicrobials as preventive measure, especially during the brooding period. It is almost like an established fact to

the farmers that antimicrobials must be used during brooding regardless of infected naval. However, some farmers also knew that, good quality chick does not need antimicrobials if it has good naval.

After the session, farmers promised that they will become more careful in AMU from that day. They also promised that they would not buy/use antimicrobials without registered doctor's prescription or advice.

Regarding a promise which indicates "only using antimicrobials in the sick birds, not in healthy birds", all farmers agreed that they will make this promise and keep it.

The last promise on this topic was to maintain withdrawal period of antimicrobials. Farmer farmers said that they could not maintain that in 80% of cases to avoid loss. Regarding reserve group antimicrobials, farmers stated that they commonly use those specially Colistin in the flock even from the 1<sup>st</sup> week of rearing. During *E. coli*, *Salmonella* infection, even the doctors are compelled to use Colistin.



## **Chapter-5: Discussion**

Upon conducting the interviews of the farmers and the government officers, it was found that the majority of farmers are unaware of farm registration. Some people had the wrong idea about farm registration and thought it was the same as the COVID-19 incentive registration and trade license registration. Lack of knowledge, a lack of supporting documentation, farmers' reluctance to invest money, and a lack of stern action from the DLS were mentioned as obstacles to farm registration. Only one-third of farmers overall were aware of the Fish and Animal Feed Act-2010. Farmers reported learning that tannery waste, meat and bone meal, growth promoters, and antimicrobials were being added to the diet. Regarding Animal Welfare Act-2019, most of the farmers are unaware of the Act. Additionally, it was discovered that farmers are not aware of how AMU contributes to AMR. Most farmers only seek veterinary medical attention as a last option. Farmers also have little knowledge about drug prohibitions and withdrawal times.

### **5.1. Farm registration**

#### **5.1.1. Current status of farm registration**

It is evident that most of the farms were non-registered and most of farmers had no prior knowledge of farm registration. Only two farmers knew about the existing policy on farm registration and its obligatory nature. An earlier study also supports this finding (Chattopadyay et al., 2018). Compliance of farm registration remains questionable, as a result, it is very difficult to trace all the farms in Bangladesh (Chattopadyay et al., 2018). This reflects the existing dearth of poultry policy awareness among the farmers. One of the profound reasons for the low level of awareness among the farmers is the communication gap between government veterinarians and the farmers. Commercial poultry farmers, small- to medium-scale farmers hardly come to UVH as feed company veterinarians are more accessible to them. The ULOs interviewed for this study mentioned that there is a performance evaluation system from DLS named APA that sets certain strategic objectives (SO) to be filled up by the completion of the financial year. This SOs vary between upazilas and are set according to the number of population and unions on that upazila. For farm registration, the annual goal is to register three to five farms (dairy and poultry) and they try to fulfill that goal. However, the number of registered farms is still very low. Upazila Livestock Officers provided further

justifications for the low registration rate. One of the associated factors for the low turn-over of farm registration is lack of manpower in the office, which limits their capacity to arrange extensive programs for motivating the farmers about policy awareness. In the majority of government offices, two or three officials are responsible for managing administrative tasks and giving treatment recommendations to patients who are being admitted to UVH. As a result, there is still little room to implement or launch special programs to raise farmer awareness.

In the policy awareness session run in eight upazilas, farmers mentioned that, government employees are overworked at the hospital and unable to give sufficient attention to farm registering.

### **5.1.2. Ways to encourage farmers to register**

Therefore, taking into account the state of the livestock department in our country, it is likely that the best course of action is to coordinate an awareness campaign that includes members of the poultry farm association, feed dealers, local health care providers, and both public and private company veterinarians. There are several private veterinarians and dealers who work more extensively with poultry farmers and other types of farmers in each upazila. Additionally, the association is particularly powerful in several upazilas and has close ties to the neighborhood farmers. These three counterparts might be a more effective source of communication and a trusted source for poultry raisers compared to government offices and could play a crucial and effective role in both raising awareness among the farmers and providing practical solutions to adopt precautionary behavior. Since these stakeholders are integral part of the community, involving them in the campaigns might increase community participation, include a local perspective to the communication, shifting power to the community level, and result in sustainable development in farmer's awareness and behavior. So teaching the private veterinarians and dealers and the poultry farmers' association members along with the government veterinarians about relevant policies and allowing them to disseminate the information to the farmers can be a fruitful solution.

### **5.1.3. Barriers to farm registration**

Farmers who contacted the livestock office to register their farms reported that they encountered several challenges while organizing the paperwork. The environment certificate was the document that was referenced the most frequently by both farmers

and government veterinarians. Farmers have also reported having issues obtaining the property deed and business license (trade license). Therefore, even when a farmer has the best of intentions, he cannot register his farm under certain situations. The solution could be for the government officials to be more accommodating when it comes to document submission. If farmers can manage the local Union Parishad chairman certificate, the officials in some upazilas would informally let them to register their farms. However, environment certificate issue can be discussed with the relevant authority to make it easy and farmer-friendly.

Farmers' reluctance to pay cash to register their farms is cited by both the authorities and the farmers as another factor for not registering their farms. Farmers are hesitant to spend the prescribed charge, even though it is a little sum because of their mindset. They strive to avoid it because they see it as an additional and unneeded expense. Farmers sought “free registration” at the policy awareness sessions, which reflected the same results as previous.

Interviews with farmers and ULOs revealed that farmers frequently request benefits from government offices in exchange for registering, and they are often more receptive when direct benefits (rather than indirect ones) are offered. Incentives to encourage farmer compliance (for example, free vaccines, free diagnostic tests and health care services, inviting to the training program) can be helpful to encourage farmers.

## **5.2. Fish and Animal Feed Act-2010**

Regarding the Feed Act, one quarter of the total interviewed farmers had some level of idea about the Act. The rest of the farmers are ignorant of the Act, which was also supported by some other earlier studies (Haque et al., 2020; Siddiki et al., 2022). For dealers, private veterinarians, and government veterinarians, however, the application of this legislation is more crucial than it is for farmers. Farmers have little ability to assess if a feed supplier is supplying safe feed or not. The corporations are entirely responsible for this, and the government official is in charge of monitoring it. However, government efforts to increase comprehension of the Feed Act are insufficient (Haque et al., 2020). As a result, feed dealers and feed companies should pay greater attention to the compliance of the Feed Act.

On the other hand, it is questionable whether the feed companies are maintaining the standard protocol and guideline in terms of feed production. The scope of assessing that

is still limited. As a part of the APA from the DLS, they visit the feed mill once in per month and analyze the feed (LEO, personal communication). But the unregistered feed mills and mill that are situated in the rural areas are still out of the radar of DLS. So, the supervision of the feed mills has to be robustly maintained by DLS to avoid any addition of additives in the feed. In the policy awareness session, farmers' demand was to increase the monitoring on the feed mills by DLS to avoid such addition in the feed and ensure safe feed. Therefore, DLS must vigorously maintain the feed mill oversight in order to prevent the addition of any additives to the feed. Farmers' requests to improve DLS's surveillance of feed mills were heard at the policy awareness workshop.

Mobile courts are conducted two times a year by the DLS in the feed and medicine shops to check the feed quality, storage condition, loose feed selling etc. It also restrains the probable addition of any adulterants in the feed. But the number is not enough to check on the large number of shops in each upazila. It should be run all the year round. Moreover, the power to punish for the crime should be in the hands of the veterinary officer rather than UNO. Therefore, the policy needs to be revised according to practicality.

### **5.3. Animal Welfare Act-2019**

The awareness among farmers on Animal Welfare Act is very poor. Farmers also mentioned several occasions where cruelties happen with the birds. Most of the farms do not have cooling system (adequate number of fans), they think it as an unnecessary and extra cost. Moreover, too much heat might lead to bird heat stroke and considerable production losses. Another sign of bad bird welfare in our nation is overcrowding of the animals. Poor handling has been reported as a particular risk to animal welfare before slaughter (Gregory, 2005; Seng and Laporte, 2005; Terlouw et al., 2008; de la Cruz et al., 2018). The most prevalent instance of poor welfare is the loading and unloading process of the birds in the vehicle while transporting. The vendors throw the birds to the vehicle which leads to injury to heads, breakage of wings or death of the birds. These are the examples of cruelty towards animal which are punishable by law. According to other reports (Alam et al., 2007; Ahsan et al., 2014), the welfare of animals during high-risk periods of transport and slaughter in Bangladesh is found to be subpar. So, awareness is very important in this regard to stop the cruelty against animals. Mass awareness campaigns via TV and social media is essential for the circulation of the message.

## **5.4. Antimicrobial usage and antimicrobial resistance**

### **5.4.1. Farmers' knowledge on judicious antimicrobial usage**

It was revealed in the interview that most farmers are unaware of existence of any guidelines of AMU in poultry. The usual practice of the farmers is to self-prescribe the antimicrobials or taking suggestion from the dealers. Using antimicrobials as preventive purpose is also a common practice by the farmers. Many other studies also support the findings of the present study (Roess et al., 2013; Ferdous et al., 2019; Imam et al., 2020; Masud et al., 2020). Some farmers use them also for growth promotion in order to increase feed conversion (Islam et al., 2016). In the policy awareness session, farmers mentioned that they frequently used antimicrobials in the brooding period to cure the naval ill. Contractual arrangements with the feed and chick dealers, who provide all production inputs (such as day-old chicks and feed) on credit to farmers and then buy the chicken products from farmers at predetermined prices, may have an impact on the AMU (Masud et al., 2020). These agreements raise the likelihood of antimicrobials being misused on chicken farms and make them more accessible in Bangladesh. Bangladesh is not the only Southeast Asian nation with simple access to antimicrobials; India, Indonesia, Nepal, Bhutan, Thailand, Sri Lanka, and the Maldives have all been mentioned (Goutard et al., 2017).

### **5.4.2. Ways to ensure judicious antimicrobial usage**

The Upazila Livestock Officers arrange training on regular interval to make the farmers aware of the bad effects of antimicrobials and its consequences. Under LDDP, every staff and officers are trained for AMU and AMR. But the amount and extent of training is not sufficient to meet the demand of all the farmers of the poultry industry. Only a fraction of farmers are being trained in the UVH, whereas the majority remains without scope of training. In the interviews, many farmers have mentioned that they have not received a single training in their entire life and started poultry business without any prior knowledge. Farmers are forced to prescribe for their own flock due to their lack of knowledge or the lack of a trained veterinarian or any formal training during a period of disease outbreak and immunization (Roess et al., 2013). So, number of training programs should be increased (Imam et al., 2020). Programs to educate commercial poultry farmers on the value of enhancing biosecurity rather than utilizing antimicrobials to lower the likelihood of the emergence of poultry diseases and reduce

the AMU (Imam et al., 2021). An intensive extension effort, educational initiative, and governmental legislation on safe AMU may result in a safe AMU indiscriminately in Bangladeshi farms (Ferdous et al., 2019).

Another important thing to consider is, whether the same chain of farmers is being trained in every training programs of the UVH (repeated training of same farmers). This increases the chance of repeated training of the same farmers, where the remotely located farmers are being deprived of training. So, another approach can be setting training arrangements in the union level, so that farmers who do not live in proximity to UVH can also get chance to come in the light of training.

To solve the problem with the manpower for conducting the training, collaboration with the private feed and medicine company veterinarians can be a good option. As the companies have both the resources and personnel to run training program, coordinating with them can be good for the farmers. In such a scenario, co-operation between government service providers and private veterinarians rather than mutual exclusion, might be a better approach.

#### **5.4.3. Farmers' knowledge on antimicrobial resistance**

It was reflected in the study that farmers do not have basic knowledge on AMU and AMR. Antimicrobial misuse can lead to treatment failures in both humans and animals (Weese et al., 2015; Ferri et al., 2017) and the formation and spread of AMR. The most common answer on bad effect of antimicrobials is lessening the weight of the chicken (as it concerns economic benefit). Some farmers also mentioned that eating antimicrobials treated birds will cause liver and kidney damage. Another misconception was antimicrobial causes cancer, ascites etc.

#### **5.4.4. Farmers' knowledge on banned drugs**

Regarding banned drugs, one third of the farmers have some idea about banned drugs- which is promising. They mostly mentioned Colistin as banned drugs, whereas some other farmers could recall combined Sulpha drugs, Azithromycin etc. Most of them, get to know about banned drugs when they went to the medicine shop for buying that particular medicine. They also mentioned about using Colistin and other banned drugs frequently in their flock. Other studies also support this finding (Imam et al., 2020). These drugs are considered as “Highest Priority Critically Important Antimicrobials”

for public health (WHO, 2019). Infections with *Enterobacteriaceae* and *Pseudomonas aeruginosa* are treated with Colistin as a last resort, but farmers are using it in the least serious diseases as a first line of therapy (WHO, 2017). The government officer also mentioned these banned drugs being used by the farmers. But recently there have been reduction in use and availability of such drugs- stated some of the government veterinarians.

#### **5.4.5. Farmers' knowledge on withdrawal period**

Regarding withdrawal period, farmers also lacked idea on the duration and the cause of maintaining that. Their common misunderstanding is withdrawal period is maintained to regain the lost weight during the antimicrobial therapy. Those who have some level of idea on withdrawal period, do not maintain it. Other studies have also reported the same finding (Ferdous et al., 2019). Farmers' failure to comply with withholding periods has traditionally been attributed to a lack of oversight by governmental bodies (Ferdous et al., 2019). In addition to monitoring antimicrobial residues in accordance with Codex regulations, this also includes monitoring farm management practices (FAO, 1963). Sadly, Bangladesh has few resources for conducting residue analyses in tissues of animal origins (Haque et al., 2017). Establishing public or private laboratories with the tools and knowledge to recognize residues will help with residue detection and monitoring sensible AMU. However, it is doubtful that farmers would really submit samples for residue testing, as regulatory organizations are typically in charge of doing such residue monitoring (Imam et al., 2020). Training of the farmers and strengthening the law is crucial to stop the misuse of antimicrobials.

During the policy awareness sessions, in order to help the farmers comprehend the Acts, various posters and booklets with story-like depictions of the Acts were created. Through these narratives, farmers became more aware of the Acts and demonstrated their intention to follow the regulations going forward. Farmers afterwards participated in a special session called "Promises to keep" where they vowed to strive to abide by the laws and register. These tool-based seminars seem to be quite effective at educating the farmers about different policy options.

### **5.5. Limitations**

This research was conducted with interviews in seven upazilas and policy session in eight upazilas of Chattogram district, so it may not be representative of all types of poultry farmers or veterinary care providers across Bangladesh. This qualitative study also included Zoom interviews (N = 3 ULOs) as well as face to face interviews (N = 46), thereby chance of lack in consistency. This bias has been avoided by making structured and specific questions in the interview guide. There may be a chance of selection bias as the farmers were sampled using snow ball or purposive methodologies; however, we followed defined criteria to select the farmers for interview. Information bias can also be there due to over reporting. There is no database related to the number of farmers or their information. So the LSPs had to be relied on for reaching out the local household farmers. The interviews were taken by three fellow researchers, which includes the possibility of interview bias. However, they were trained for before the study. Recall bias might also have happened as farmer's responses were to be depended on for most of the questions. Interviews with the District Livestock Officer (DLO), Deputy Director, and Director (Chattogram) might have provided further clarification and conclusion of the facts mentioned in this study. These interviews should be done in next stage of the study.

### **5.6. Conclusions**

In a developing country like Bangladesh, the absence of adequate government animal healthcare system, insufficient monitoring and regulatory services are leading to poor policy awareness and implementation. The rate of farm registration is insufficient, and the scope of communication between a government veterinarian and farmer is still very truncated. The monitoring of the Feed Act is primarily limited to the mobile court. Compliance with the Animal Welfare Act is also not notable in the country. Farmers are reportedly using antimicrobials indiscriminately, which might increase AMR, a global concern for both human and animal health. Developing tools to increase the knowledge, skill and awareness level of the farmers is a potentially useful approach that should be considered.



## **Chapter-6: Recommendations and future directions**

### **6.1. Recommendations**

Government officers working in the field have a key role in raising farmer awareness by reaching the grass root level farmers with the help of local politicians, feed dealers along with different company veterinarians. Educating the dealers and the local human and animal health care providers can also bring benefit to reduce the policy non-compliance in the poultry industry. TV and other media public service announcements on the existing policies can be done as awareness program. Increasing collaboration between public and private veterinarians can be very beneficial for farmers. Standard operating procedures and guidelines for each Act should be developed by government and then distributed to the private sector and to farmers. In this way, the existing communication gap between the farmers and the government can be abolished with the assistance of private veterinarians.

### **6.2. Future directions**

1. Identify, develop and test potential tools to improve the relationship between all the stakeholders for improved policy awareness and policy compliance.
2. Conduct and explore the views of more stakeholders (Director-DLS, Deputy Director, DLO, Private veterinarians) for further exploration.
3. Replicate this study in other parts of Bangladesh to explore the situation in those areas.
4. Explore the status of compliance with other relevant policies such as (Animal Slaughter Act and Meat Quality Control Act, National Livestock Development Policy, National Livestock Extension Policy) in the study area.
5. Refine the policies as required and prepare easy-to-understand SOPs and guidelines for the farmers.

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## **Appendix-A: Interview guide for farmers**

### **Background to farm and current practices**

- i. What do you farm? How many birds (flock size) and what kind and strain?
- ii. How many sheds are there in your farm? And how many birds per shed? How many staff do you have? What are their responsibilities?
- iii. Is poultry the only livestock on your farm?
- iv. Tell us about your daily routine in your farm.
- v. What is one of the biggest positives about your business?
- vi. What are the biggest challenges faced in your business?
- vii. Is infectious disease of concern on your farm? Is there anything you do to control disease?
- viii. Tell us about hygiene practices on your farm? How often and what areas do you clean? What reagents you use for that? Do you have footbath or spray?
- ix. How did you learn to farm and decide to do everything you just described in the way you do it? Did anyone teach or guide you?
- x. Has anyone or anything been influential on how you do business/farm since you started?

### **Agreements/contracts shaping the business (Upstream and downstream agreements and contracts with feed dealer)**

- i. Do you have any formal or informal agreement with feed dealers (for credit or cash farmer)? If yes, what are the important features of the formal or informal agreement?
  - a) How did that agreement/relationship develop?
  - b) Are there things you like about the current relationship/agreement you have?
  - c) Is there anything challenging or that they don't like about the (formal/informal) agreement?

- d) Have you ever worked with another feed dealer than the one you currently have an agreement with?
- ii. How are birds sold? Do you sell directly to the retailers or wholesale stalls? Or via any middleman (feed dealer)?
- iii. Do you sell a fraction of birds to the stalls without informing the dealer? If yes, is it in the local market or distant market?

**Questions Regarding Policy areas:**

**1. Farm Registration**

- i. Are there any government policies relating to farm establishment that influence how you established and manage your poultry farm? If yes, what are the pre-requisites of having farm registration; If not, why not?
- ii. Is non-registration due to money issues? Is the registration too complex?
- iii. Is this to avoid govt. oversight? If yes, then what type of government supervision you want to avoid?
- iv. Do Government veterinarians play a role in establishing and registering poultry farms?
- v. Do private vets play a role (feed company/pharmaceutical company/independent consultant) in establishing and registering poultry farms?
- vi. Is there any poultry association in your area? If yes, are you a member? What are the roles of in the association in establishing and registering poultry farms?
- vii. Do feed dealers play any role in establishing and registering poultry farms?

**2. Awareness of policies / regulations around feed use**

- i. Are there any government regulations relating to animal feed?  
Probe: have you heard of regulations relating to the use of antimicrobials and growth hormone, steroids, insecticide contamination, poultry feed mixed with poorer quality ingredients and rotten feed?
- ii. If awareness of regulations demonstration, ask “Do you think these regulations can be implemented?” If not, why not?

**3. Food Safety Regulations and Practices (Animal Disease Act-2005)**

- i. Are there regulations relating to farm-biosecurity and farm hygiene and its implementation? (e.g., like isolation shed for diseased bird, separate suit and boots for entering, disposal pit, compost system for litter management, spray, footbath)
- ii. Are there regulations relating to disease prevention (Probe: e.g. compulsory vaccination against endemic poultry diseases)

**4. Animal welfare**

- i. Are there regulations relating to animal welfare? Probe: what is your opinion of practices such as lifting the chicken by their legs, throwing the chickens in the van while loading, slaughtering in front of others birds?
- ii. Do you think animal welfare practices encouraged by the government vet are practical or logical?
- iii. Can you implement them on your farm? How practical is that?

**5. Slaughter/handling/transportation practice**

- i. Where do you slaughter your birds if needed (sick birds or healthy birds)?
- ii. Where do you dispose of your sick/dead birds?
- iii. What do you do with your sick birds?

- iv. How are birds sold? If yes, is it in the local market or distant market?

**6. Antimicrobial usage**

- i. Are there rules and regulations regarding antimicrobial use? (Probe: What is your understanding of ‘withdrawal period’, not using antimicrobials in the feed, obtaining vet’s prescription for antibiotic use, caution about using watch (Cephalosporin group, Ciprofloxacin, Macrolides) and reserved group (Colistin, Polymyxin B) antimicrobials.
- ii. How practical is that? Do you think it can be implemented? If no, why?

**Others: Practices observed in during field visits and explanations given by the farmers about these practices (Government support, services, subsidies and tax)**

- i. How do you obtain electricity for your farm? (Household / commercial )
- ii. Are there any subsidies for poultry farming, or farming or in poultry feed, medicine or in general that are applicable to you? Do you receive these or not? Why?
- iii. Have you received any support during COVID-19 pandemic? If yes, from government or NGOs or poultry company?
- iv. Are there any training programmes or extension services by the government/NGOs/poultry company/pharmaceutical company/feed company available to you? Do you attend that/ If not, why?
- v. Are your poultry production activities taxed? If yes, how?
- vi. Are there anything you wish had more oversight/guidelines relating to your poultry business? If so, who would you want/expect to implement or oversee this?

## **Appendix-B: Interview guide for the government officers**

- i. Details about your role – describe in detail what your role is, what your daily routine is like, who you interact with for your role/during their day?
- ii. Farm registration: process and benefits for farmers; reasons for farmers' reluctance to register.
- iii. Implementation and enforcement of regulation such as Animal Welfare Act, Animal Feed Act, AMU and AMR guidelines.
- iv. Role of UVH antimicrobial use strategy.
  - v. Role in disease prevention (vaccination, else).
  - vi. Role in oversight of veterinary practitioners.
- vii. Procedures to deal with infringements, including mobile courts and other legal procedures.
- viii. Training, outreach, extension support provided for farmers.
- ix. COVID-19 related support to farmers.
  - x. Reporting to other government offices.
  - xi. Any poultry related sector policy or strategy?

## **Brief biography**

Syeda Munira Dilshad obtained her Doctor of Veterinary Medicine Degree (DVM) in 2019 (graduation held in 2020) from Chattogram Veterinary and Animal Sciences University (CVASU) securing a CGPA 3.84 (in the scale of 4.00). Now she is a candidate for the degree of MS in Epidemiology under the Department of Medicine and Surgery, Faculty of Veterinary Medicine, CVASU. She is interested in conducting research on Epidemiology, Policy and One Health research in the future.