

Impact of COVID-19 Pandemic on Poultry Sector in Northern Bangladesh

Somrita Alam*
Md. Abdul Wadud**

Abstract

The COVID-19 pandemic has created an undesirable impact and uncertainty in the poultry sector of Bangladesh. COVID-19 and its accompanying effects have severely affected about 65–70 thousand commercial poultry farms in Bangladesh. Many small and medium poultry farms are closed down or halted production due to the burden of continuous losses. There have been about 30-45% reductions in day-old chick production, 35-40% reductions in poultry feed production and 40-50% in the sale of medicines and other pharmaceutical products. It has created an unwanted mismatch between the demand for and supply of poultry products. This study attempts to determine to what extent the sector has been affected by the COVID-19 crisis. Data were collected from 81 Layer farms in Paba and Bagmara Upazila, 30 Broiler farms in Chorghat Upazila and 30 Sonali farms in Paba Upazila of Rajshahi district in Bangladesh using a pretested interview questionnaire. Respondents are interviewed between January 2021 and early July 2021. Collected data are analysed, and the result shows that 88% of Layer, 83% of Broiler and 73% of Sonali farmers do not get sufficient market demand for their products during the COVID-19 pandemic. About 90% of Layer, 86% Broiler and 76% Sonali producers do not get enough market price for eggs and meat. Result also shows the loss among Layer, Broiler and Sonali farms and producers. About 81% of Layer, 76% Broiler and 86% Sonali producers say that they do not get financial support from the government to mitigate losses during the COVID-19 pandemic. Government should retaliate by providing financial assistance to poultry producers and could develop long-term, sustainable strategies to ensure further capacity building.

* Assistant Professor, Department of Economics, University of Rajshahi.
Email: somrita.ru14@gmail.com

** Professor, Department of Economics, University of Rajshahi. Corresponding author;
Email: wadud68@yahoo.com

Keywords *COVID-19 · Poultry Sector · Production · Marketing · Price Fluctuation · Government · Northern Bangladesh*

1. Introduction

From Wuhan city in China, Coronavirus (COVID-19) spread to 212 countries worldwide and infected 30 million people by 18 September 2020. The coronavirus disease (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), belonging to the species Severe acute respiratory Syndrome-related CoVs (SARS-rCoV). COVID-19 creates one of humankind's biggest health and economic crises. Around 258 million people have been affected by COVID-19, and around 5 million people died worldwide (World Health Organization, 22 November 2021). In Bangladesh, the first case was registered on 8 March 2020, and up to the 25 November 2021, overall, 1574636 confirmed cases and 27958 people died (IEDCR, 22 November 2021). It has created a severe negative impact not only on the health sector in the country but also on all aspects of living conditions. In addition to its effects on public health, COVID-19 has affected social and economic life in many ways. COVID-19's effects on the significant economic and financial indicators of the economy of Bangladesh, including agriculture, livestock sector, industrial sector, production, wages, price levels, investments, remittances and foreign trade (BBS).

The livestock sector is one of Bangladesh's most promising and hopeful sectors. About 0.3 million dairy farms and about 65–75 thousand commercial poultry farms are currently operating in the country (The Financial Express, 2020). The Department of Livestock Services reported that the contribution of livestock to Bangladesh's Gross Domestic Product (GDP) is 2.9 %, with the GDP growth rate of the livestock sector being 5.5%. The livestock sector contributes 23.2% to the overall agricultural GDP in Bangladesh (BSS, 2021). This sector generates 20% direct employment and 50% partial, which also plays a vital role in the national economy of Bangladesh. More than 70% of rural households are engaged in livestock, contributing a more significant share to the livelihoods of rural people and landless families. But the recent COVID-19 pandemic negatively affected this sector and other sectors of Bangladesh. Government has lockdown people's movements to control the spread of the disease. Like all livelihood sectors, the livestock sector falls into a severe complication. The Poultry product market is also facing continuous loss. Disrupted production and transportation, declining consumer demand and fluctuating market price of chicken and eggs brought substantial financial difficulties. Many small and medium poultry farms are closed as a result of the impact of the pandemic (BPICC, 2020).

Bangladesh's Poultry Industry is one of the critical job generators for people and has an investment of Tk. 350 billion (BPCCI, 2021). The poultry sector contributes to Gross Domestic Product (GDP) by 1.5-1.6 per cent and annually grows at an average 12-15 per cent rate (DLS, 2020). The poultry sector has

incurred a loss of Tk115 billion within just two weeks, from 20 March to 4 April 2020, as it has been hit hard by the Covid-19 pandemic (BPICC, 2020). The prices of poultry products have drowned to a record low in 12 years due to COVID-19 (OHPH, 2020). According to Bangladesh Poultry Industries Central Council (BPICC) data, following the detection of coronavirus in the country, poultry feed production fell by 75%. The unit price of the Day-One-Chick (DOC) came down to Tk1.0 from the production cost of Tk35, and the sale of processed poultry food declined by 95% since 20 March.

In 2018-19, the total production of eggs in Bangladesh was 17.11 billion. It met 98.8% of the country's demand. Overall meat production was 7.6 million metric tons (MOFL-Ministry of Fisheries Livestock, 2020a). After March 2020, these production levels fell by around 50% (Berkhout, 2020). Lockdown effect, disruption to supply and transport was a primary reason for this. It significantly adversely affected all stakeholders along the transaction chain, from producers to sellers, resulting in a sharp fall in chicken and egg prices. Retailers reported that they could not continue regular trading practices in markets and shops. This resulted from government restrictions on all businesses to prevent public gatherings (World Health Organization, 2020b). In addition, all kinds of social, religious and political events such as weddings, parties, religious congregations, and election campaigns, where chicken and eggs were necessary food items, were banned (Ali, 2020). While the closure of restaurants, including those of the fast-food or quick-service restaurants, further greatly impacted the demand, the disruption of transport chains and the closure of several wholesale markets and malls in the cities affected the supply chains. As in the case of eggs, the lack of sufficient storage facilities in large layer farms and cold-chain facilities led to forced disposal of the produce at a through-away price.

Meanwhile, rumours have circulated on social media linking chicken consumption with coronavirus. One rumour that gained public attention was that consuming poultry and poultry products could cause COVID-19 (Islam and Babu, 2020; Mahmud, 2020). Several shocking incidents have been reported from different places of the country, such as burying thousands of live birds to avoid the spread of COVID-19, killing and burning the birds in masses and just giving them for free due to a decline in sales. Several small and medium-scale poultry farms continue the grow-out farming activities with the hope to profit from the sale of the products later.

The backyard poultry sector, small, medium and large scale poultry farms, landless labourers, small hatcheries, and small and medium feed mills probably have been equally affected due to the COVID-19 pandemic. The poultry hatcheries have been badly affected due to almost no demand for chicks from the growers. Small-scale and medium-scale poultry farmers have weak access to formal institutions for support services for finance, birds' health, poultry management and marketing of eggs and chickens.

They are obstructed by a lack of capital, skills, knowledge and modern

technologies (Islam et al., 2014; Rahman et al., 2014). As small-scale farmers are not organised to receive government support, they have received little financial support to mitigate losses due to the COVID-19 pandemic and escape hardship.

2. Literature Review

The COVID-19 crisis has affected the world in an unprecedented way (Loayza and Pennings 2020). Like all the countries, Bangladesh also felt the negative shock of COVID-19. The government has made several attempts to control the pandemic, including national lockdowns, travel restrictions, border closures and controls. These attempts have resulted in some inevitable negative consequences. The livestock and poultry sectors are no exception. (Hamid et al., 2017) found that price fluctuation of live birds and eggs, the rising price of poultry feed, scarcity of DOC, and lack of technical knowledge are significant challenges to developing the poultry sector. Moreover, the insufficient coordination between the country's public-private and research institutions and inadequate government oversight of the poultry sector is hampering the development of this sector. Despite these challenges, COVID-19 still presented a new and extreme challenge to the sector, introducing new problems and exacerbating some of these existing ones.

Abdullah et al. (2021) researched whether seasonal variations could have explained observed poultry price patterns; prices for the first half of 2020 were compared with those for 2016. Forty-three vendors operating in six markets in Dhaka and Chattogram were interviewed monthly about the retail prices of their exotic broiler and chickens to assess price changes over a year. By 25 March, their price had dropped by 28% compared to their 1 January 2020. Feed production decreased by nearly 40% between April and June 2020 (Saeque, 2020).

Several news articles also presented rumours as a major cause of the drop in consumer demand for poultry products (Ali, 2020; Sharma, 2020). These articles describe how misconceptions about the potential transmission of COVID-19 by chickens and other meat products led consumers to cut back on chicken consumption, contributing to a sharp drop in market demand with the result that prices fell by as much as 75% (Mahmud, 2020).

The Bangladesh Poultry Industries Central Council (BPICC) reported that 50–60% of poultry farms closed temporarily in response to COVID-19 (Ali, 2020). 30% of Broiler farms and hatcheries that closed due to the pandemic in April 2020 have remained closed to date (Financial Express, 2021). Many large-scale farms reduced their flock size, resulting in chicken meat production rapidly declining from 900000 to 28000 tons per month (Ali, 2020). Food Agriculture Organization (2020b) says that for Layer farmers, the cost of production per egg was around BDT 5.50, but the market price fell to BDT 4.00. Nevertheless, it was reported that nearly 50% of eggs remained unsold. From the onset of the pandemic until April, 32–35% of the Layer farms were utterly closed (Ali, 2020). Many farmers sold

their laying birds before the end of their laying cycle to reduce financial losses.

Despite government efforts to reduce financial loss across the sector in the form of cash incentives, subsidised feed, medicine and vaccines and health messaging to counteract rumours, small and medium-scale poultry farmers still described the need for financial support from the government and urged national and international NGOs and multinational organisations to help (Amin, 2020; MOFL-Ministry of Fisheries and Livestock, 2020).

This study aims to focus on the impact of COVID-19 on small, medium and large scale Layer, Broiler and Sonali farms production and marketing in northern Bangladesh. The study also explores the role of government, NGOs and feed companies in limiting the losses of poultry farmers during the COVID-19 pandemic.

3. Materials and Methods

3.1 Source of Data

Both primary and secondary data are used for the study. Data has collected from 81 Layer farm owners in Paba and Bagmara Upazila, 30 Broiler farm owners in Charghat Upazila and 30 Sonali farm owners from Paba Upazila using structured questionnaires from January 2021- to July 2021. These samples are selected randomly for the study. Besides, different print and electronic media reports are analysed to understand the effects of COVID-19 on the poultry sector. Secondary data are collected from other organisations, viz. Upazila Livestock Office, Department of Livestock Office (DLS) and Upazila Agriculture Extension office.

3.2 Study Area

This study uses quantitative and qualitative methods to assess the COVID-19 impact on the poultry sector. We select the Rajshahi district using purposive sampling. The study is conducted in Paba, Charghat and Bagmara Upazila of Rajshahi District. Paba Upazila is located 24⁰15' to 24⁰31' north latitudes and 88⁰28' east to 88⁰43' east longitude with an area of 280.42 sq. km. Charghat Upazila is located 24⁰14' to 24⁰22' north latitudes and 88⁰46' east to 88⁰52' east longitude with an area of 164.52 sq km. Bagmara Upazila is located in between 24⁰30' and 24⁰414' north latitudes and in between 88⁰41' east and 88⁰58' east longitude with an area of 363.3 sq. km (Source: Banglapedia).

3.3 Data Collection Method

Primary data from respondents is collected using questionnaire interviews. A set of interview schedules is designed for the study. The questionnaire is designed for both close and open form of questions. The interview schedule is developed logically so that poultry farmers can answer systematically. Each question is explained clearly and asked systematically for their sound understanding.

3.4 Data Processing and Analysis

Mainly descriptive statistics are employed in analysing the data. The collected data are verified to eliminate errors and inconsistencies. Any inconsistencies in the collected data are searched and avoided from the relevant data. Data are processed and entered into the computer using MS Excel (Microsoft Excel) and SPSS (Statistical Package for Social Science) programming and analysed as per objectives by tabular and graphical method.

3.5 Demographic Profile of Survey Respondent

The study analysis was based on 96% male and 4% female farm owner respondents. It is also found that about 66% of respondents have primary to higher secondary education and 6% have graduation and post-graduation education, and the remaining 28% are illiterate.

3.6 Size of Poultry Farms

In this study, out of 141 respondents, 66% are engaged in agriculture, 31% are businessmen, and 3% are in services. Among 81 Layer farms, about 2% of respondents have small size farms (100-500 birds), 6% have medium (501-1000 birds), 88% have large sizes (1001-5000 birds), and the remaining have very large size (5000-above). Among 30 Broiler farms, about 4% of respondents have small size farms (100-500 birds), 30% have medium (501-1000 birds), 65% have large size (1001-5000 birds), and the remaining have very large size (5000-above). Among 30 Sonali farms, about 3% of respondents have small size farms (100-500 birds), 25% have medium (501-1000 birds) and 71% have large size (1001-5000 birds), and the remaining have very large size (5000-above).

3.7 Market Weight and Price of Chicken and Eggs During the Pandemic Period

About 83% of Layer farm owners sold eggs produced in the wholesale market at below 5tk per egg, whereas they claimed that the cost of producing an egg was Tk 6. About 80% of Broiler farm owners considered market weight like 2 kg to 2.5 kg per bird, whereas the rest, 22%, sold Broiler weighing about 1.5 kg to 1.9 kg per bird. Most respondents (78%) sold Broiler for 30 to 38 days, and about 85% sold Broiler in the wholesale market at 105-110 taka per kg. About 86% of Broiler farm owners had a production cost of approximately 95-100 taka per kg live bird. About 83% of Sonali farm owners considered market weight 0.7 kg to 1kg per bird, whereas the rest, 17%, sold Sonali weighing 1kg to 1.2 kg per bird. Most respondents (80%) sold Sonali for 60 to 70 days, and about 75% sold Sonali in the wholesale market at 170-190 taka per kg. About 36% of respondents had a production cost of approximately 160-170 taka per kg live Sonali bird.

3.8 Training, Vaccination and Treatment of Poultry

Among 141 respondents, about 53% of farm owners have taken short training on bird rearing, poultry management, marketing and biosecurity. Around 95% of respondents vaccinated their birds regularly, and 70% of respondents used medicine and vitamin regularly to maintain birds' health.

3.9 Covid-19 Impact at the Household Level

Almost all respondents (94%) reported significantly reduced household income. The study findings confirm that 62% of surveyed households used their savings, and 25% took loans from NGOs and other non-government organisations to manage household expenditure during the COVID-19 pandemic. Around 11% of respondents reported that their household members lost their job or opportunity to earn due to the COVID-19 outbreak.

4. Results and Finding

From the structured survey questionnaire, the responses that were found from Layer farm owners are shown in Table 1.

Table 1: Frequency distribution for the impact of COVID-19 pandemic on Layer production and marketing in Rajshahi district of Bangladesh

| Variables | Options | Frequency | Percentage (%) | Cumulative Percentage |
|--|-------------------|-----------|----------------|-----------------------|
| 1. Do you think the production is hampered during COVID-19 pandemic due to shortage of capital in proper time? | Strongly agree | 63 | 77.7 | 77.76 |
| | Agree | 11 | 13.57 | 91.35 |
| | Neutral | 5 | 6.17 | 97.52 |
| | Disagree | 2 | 2.50 | 100 |
| | Strongly Disagree | 0 | 0 | 100 |
| | Total | 81 | 100 | 100 |
| 2. Do you agree that the optimum level of production is hampered due to lack of forecasting policy regarding the market demand of product? | Strongly agree | 71 | 87.65 | 87.65 |
| | Agree | 5 | 6.17 | 93.82 |
| | Neutral | 4 | 4.94 | 98.76 |
| | Disagree | 1 | 1.24 | 100 |
| | Strongly Disagree | 0 | 0 | 100 |
| | Total | 81 | 100 | 100 |
| 3. Do you think the role of local livestock agency (Govt.) is satisfactory during COVID-19 pandemic? | Strongly agree | 5 | 6.17 | 6.17 |
| | Agree | 18 | 22.22 | 22.22 |
| | Neutral | 12 | 14.81 | 43.2 |
| | Disagree | 41 | 50.62 | 93.82 |
| | Strongly Disagree | 5 | 6.18 | 100 |
| | Total | 81 | 100 | 100 |

| Variables | Options | Frequency | Percentage (%) | Cumulative Percentage |
|--|-------------------|-----------|----------------|-----------------------|
| 4. Do you think the role of NGOs is satisfactory during COVID-19 pandemic? | Strongly agree | 4 | 4.94 | 4.94 |
| | Agree | 9 | 11.11 | 16.05 |
| | Neutral | 11 | 13.58 | 29.63 |
| | Disagree | 31 | 38.27 | 67.9 |
| | Strongly Disagree | 26 | 32.10 | 32.10 |
| | Total | 81 | 100 | 100 |
| 5. Do you think the role of feed companies is satisfactory during COVID-19 pandemic? | Strongly agree | 2 | 2.47 | 2.47 |
| | Agree | 9 | 11.11 | 13.58 |
| | Neutral | 15 | 18.52 | 32.1 |
| | Disagree | 41 | 50.62 | 82.72 |
| | Strongly Disagree | 14 | 17.28 | 100 |
| | Total | 81 | 100 | 100 |
| 6. Do you think the marketing system is hampered during COVID-19 period? | Strongly agree | 49 | 60.50 | 60.50 |
| | Agree | 25 | 30.86 | 91.36 |
| | Neutral | 5 | 6.17 | 97.53 |
| | Disagree | 2 | 2.47 | 100 |
| | Strongly Disagree | 0 | 0 | 100 |
| | Total | 81 | 100 | 100 |
| 7. Do you think the fluctuation of market price of poultry product causes major damage in poultry sector during COVID-19 pandemic? | Strongly agree | 78 | 96.30 | 96.30 |
| | Agree | 3 | 3.70 | 100 |
| | Neutral | 0 | 0 | 100 |
| | Disagree | 0 | 0 | 100 |
| | Strongly Disagree | 0 | 0 | 100 |
| | Total | 81 | 100 | 100 |
| 8. Do you get sufficient market demand for meat and eggs during COVID-19 pandemic? | Yes | 9 | 11.11 | 11.11 |
| | No | 72 | 88.89 | 100 |
| | Total | 81 | 100 | 100 |
| 9. Do you get sufficient market price for meat and eggs during COVID-19 pandemic? | Yes | 8 | 9.88 | 9.88 |
| | No | 73 | 90.12 | 100 |
| | Total | 81 | 100 | 100 |
| Table 1 Continued | | | | |
| 10. Is there any scarcity of DOC during COVID-19 pandemic? | Yes | 55 | 67.90 | 67.90 |
| | No | 26 | 32.10 | 100 |
| | Total | 81 | 100 | 100 |
| 11. Is there any scarcity of poultry feed during COVID-19 pandemic? | Yes | 19 | 23.46 | 23.46 |
| | No | 62 | 76.54 | 100 |
| | Total | 81 | 100 | 100 |

| Variables | Options | Frequency | Percentage (%) | Cumulative Percentage |
|--|---------|-----------|----------------|-----------------------|
| 12. Are there any scarcity of medicine, vitamin, vaccination and others inputs during COVID-19 pandemic? | Yes | 60 | 74.07 | 74.93 |
| | No | 21 | 25.93 | 100 |
| | Total | 81 | 100 | 100 |
| 13. Do you get any financial Support from government to mitigate loses During pandemic? | Yes | 15 | 18.50 | 18.50 |
| | No | 66 | 81.48 | 100 |
| | Total | 81 | 100 | 100 |
| 14. Do you get any financial Support from NGOs? | Yes | 6 | 7.41 | 7.41 |
| | No | 75 | 92.59 | 100 |
| | Total | 81 | 100 | 100 |
| 15. Do you get any financial Support from feed companies? | Yes | 49 | 60.59 | 60.59 |
| | No | 32 | 34.51 | 100 |
| | Total | 81 | 100 | 100 |

From the structured survey questionnaire, the responses that were found from Broiler farm owners are shown in Table 2.

Table 2: Frequency distribution for the impact of COVID-19 pandemic on Broiler production and marketing in Rajshahi district of Bangladesh

| Variables | Options | Frequency | Percentage (%) | Cumulative Percentage |
|--|-------------------|-----------|----------------|-----------------------|
| 1. Do you think the production is hampered during COVID-19 pandemic due to shortage of capital in proper time? | Strongly agree | 25 | 83.34 | 83.34 |
| | Agree | 4 | 13.33 | 96.67 |
| | Neutral | 1 | 3.33 | 100 |
| | Disagree | 0 | 0 | 100 |
| | Strongly Disagree | 0 | 0 | 100 |
| | Total | 30 | 100 | |
| 2. Do you agree that the optimum level of production is hampered due to lack of forecasting policy regarding the market demand of product? | Strongly agree | 23 | 76.67 | 76.67 |
| | Agree | 5 | 16.66 | 93.33 |
| | Neutral | 2 | 6.67 | 100 |
| | Disagree | 0 | 0 | 100 |
| | Strongly Disagree | 0 | 0 | 100 |
| | Total | 30 | 100 | 100 |
| 3. Do you think the role of local livestock agency (Govt.) is satisfactory during COVID-19 pandemic? | Strongly agree | 2 | 6.67 | 6.67 |
| | Agree | 6 | 20 | 26.67 |
| | Neutral | 2 | 6.67 | 33.34 |
| | Disagree | 12 | 40 | 73.37 |
| | Strongly Disagree | 8 | 26.67 | 100 |
| | Total | 30 | 100 | 100 |
| 4. Do you think the role of NGOs is satisfactory during COVID-19 pandemic? | Strongly agree | 0 | 0 | |
| | Agree | 5 | 16.67 | 16.67 |
| | Neutral | 4 | 13.33 | 30 |
| | Disagree | 15 | 50 | 80 |
| | Strongly Disagree | 6 | 20 | 100 |
| | Total | 30 | 100 | 100 |

| Variables | Options | Frequency | Percentage (%) | Cumulative Percentage |
|--|-------------------|-----------|----------------|-----------------------|
| 5. Do you think the role of feed companies is satisfactory during COVID-19 pandemic? | Strongly agree | 2 | 6.67 | 6.67 |
| | Agree | 7 | 23.33 | 30 |
| | Neutral | 8 | 26.67 | 56.67 |
| | Disagree | 10 | 33.33 | 90 |
| | Strongly Disagree | 3 | 10 | 100 |
| | Total | 30 | 100 | 100 |
| 6. Do you think the marketing system is hampered during COVID-19 period? | Strongly agree | 20 | 66.67 | 66.67 |
| | Agree | 6 | 20 | 86.67 |
| | Neutral | 4 | 13.33 | 100 |
| | Disagree | 0 | 0 | 100 |
| | Strongly Disagree | 0 | 0 | 100 |
| 7. Do you think the fluctuation of market price of poultry product causes major damage in poultry sector during COVID-19 pandemic? | Total | 30 | 100 | 100 |
| | Strongly agree | 22 | 73.33 | 73.67 |
| | Agree | 7 | 23.34 | 96.67 |
| | Neutral | 1 | 3.33 | 100 |
| | Disagree | 0 | 0 | 100 |
| | Strongly Disagree | 0 | 0 | 100 |
| 8. Do you get sufficient market demand for meat and eggs during COVID-19 pandemic? | Total | 30 | 100 | 100 |
| | Yes | 5 | 16.67 | 16.67 |
| | No | 25 | 83.33 | 100 |
| 9. Do you get sufficient market price for meat and eggs during COVID-19 pandemic? | Total | 30 | 100 | 100 |
| | Yes | 4 | 13.33 | 13.33 |
| | No | 26 | 86.67 | 100 |
| 10. Is there any scarcity of DOC during COVID-19 pandemic? | Total | 30 | 100 | 100 |
| | Yes | 17 | 56.67 | 56.43 |
| | No | 13 | 43.33 | 100 |
| 11. Is there any scarcity of poultry feed during COVID-19 pandemic? | Total | 30 | 100 | 100 |
| | Yes | 22 | 73.33 | 73.33 |
| | No | 8 | 26.67 | 100 |
| 12. Are there any scarcity of medicine, vitamin, vaccination and others inputs during COVID-19 pandemic? | Total | 30 | 100 | 100 |
| | Yes | 20 | 66.66 | 66.66 |
| | No | 10 | 33.34 | 100 |
| 13. Do you get any financial Support from government to mitigate losses During pandemic? | Total | 30 | 100 | 100 |
| | Yes | 7 | 23.33 | 23.33 |
| | No | 23 | 76.67 | 100 |
| 14. Do you get any financial Support from NGOs? | Total | 30 | 100 | 100 |
| | Yes | 3 | 10 | 10 |
| | No | 27 | 90 | 100 |

| Variables | Options | Frequency | Percentage (%) | Cumulative Percentage |
|---|---------|-----------|----------------|-----------------------|
| 15. Do you get any financial Support from feed companies? | Yes | 6 | 20 | 20 |
| | No | 24 | 80 | 100 |
| | Total | 30 | 100 | 100 |

From the structured survey questionnaire, the responses that were found from Sonali farm owners are shown in Table3.

Table 3: Frequency distribution for the impact of COVID-19 pandemic on Sonali production and marketing in Rajshahi district of Bangladesh

| Questions | Options | Frequency | Percentage (%) | Cumulative Percentage |
|--|-------------------|-----------|----------------|-----------------------|
| 1. Do you think the production is hampered during COVID-19 pandemic due to shortage of capital in proper time? | Strongly agree | 17 | 56.67 | 56.67 |
| | Agree | 9 | 30 | 86.67 |
| | Neutral | 2 | 6.67 | 93.34 |
| | Disagree | 2 | 6.67 | 100 |
| | Strongly Disagree | 0 | 0 | 100 |
| | Total | 30 | 100 | 100 |
| 2. Do you agree that the optimum level of production is hampered due to lack of forecasting policy regarding the market demand of product? | Strongly agree | 15 | 50 | 50 |
| | Agree | 8 | 26.67 | 76.67 |
| | Neutral | 4 | 13.33 | 90 |
| | Disagree | 3 | 10 | 100 |
| | Strongly Disagree | 0 | 0 | 100 |
| | Total | 30 | 100 | 100 |
| 3. Do you think the role of local live-stock agency (Govt.) is satisfactory during COVID-19 pandemic? | Strongly agree | 2 | 6.67 | 6.67 |
| | Agree | 5 | 16.67 | 23.34 |
| | Neutral | 7 | 23.33 | 46.67 |
| | Disagree | 14 | 46.67 | 93.34 |
| | Strongly Disagree | 2 | 6.67 | 100 |
| | Total | 30 | | 100 |
| 4. Do you think the role of NGOs is satisfactory during COVID-19 pandemic? | Strongly agree | 6 | 20 | 20 |
| | Agree | 5 | 16.67 | 36.67 |
| | Neutral | 2 | 6.67 | 44.34 |
| | Disagree | 15 | 50 | 94.67 |
| | Strongly Disagree | 2 | 6.67 | 100 |
| | Total | 30 | 100 | 100 |

| Questions | Options | Frequency | Percentage (%) | Cumulative Percentage |
|--|-------------------|-----------|----------------|-----------------------|
| 5. Do you think the role of feed companies is satisfactory during COVID-19 pandemic? | Strongly agree | 0 | 0 | 0 |
| | Agree | 3 | 10 | 10 |
| | Neutral | 4 | 13.33 | 23.34 |
| | Disagree | 16 | 53.34 | 76.67 |
| | Strongly Disagree | 7 | 23.33 | 100 |
| | Total | 30 | 100 | 100 |
| 6. Do you think the marketing system is hampered during COVID-19 period? | Strongly agree | 22 | 73.33 | 73.33 |
| | Agree | 6 | 20 | 93.33 |
| | Neutral | 2 | 6.67 | 100 |
| | Disagree | 0 | 0 | 100 |
| | Strongly Disagree | 0 | 0 | 100 |
| | Total | 30 | 100 | 100 |
| 7. Do you think the fluctuation of market price of poultry product causes major damage in poultry sector during COVID-19 pandemic? | Strongly agree | 26 | 86.67 | 86.67 |
| | Agree | 3 | 10 | 96.67 |
| | Neutral | 1 | 3.33 | 100 |
| | Disagree | 0 | 0 | 100 |
| | Strongly Disagree | 0 | 0 | 100 |
| | Total | 30 | 100 | 100 |
| 8. Do you get sufficient market demand for meat and eggs during COVID-19 pandemic? | Yes | 8 | 26.67 | 26.67 |
| | No | 22 | 73.33 | 100 |
| | Total | 30 | 100 | 100 |
| 9. Do you get sufficient market price for meat and eggs during COVID-19 pandemic? | Yes | 7 | 23.33 | 23.33 |
| | No | 23 | 76.67 | 100 |
| | Total | 30 | 100 | 100 |
| 10. Is there any scarcity of DOC during COVID-19 pandemic? | Yes | 23 | 76.67 | 76.67 |
| | No | 7 | 23.33 | 100 |
| | Total | 30 | 100 | 100 |
| 11. Is there any scarcity of poultry feed during COVID-19 pandemic? | Yes | 18 | 60 | 60 |
| | No | 12 | 40 | 100 |
| | Total | 30 | 100 | 100 |
| 12. Are there any scarcity of medicine, vitamin, vaccination and others inputs during COVID-19 pandemic? | Yes | 19 | 63.33 | 63.33 |
| | No | 11 | 36.37 | 100 |
| | Total | 30 | 100 | 100 |
| 13. Do you get any financial Support from government to mitigate losses During pandemic? | Yes | 6 | 20 | 20 |
| | No | 24 | 80 | 100 |
| | Total | 30 | 100 | 100 |
| 14. Do you get any financial Support from NGOs? | Yes | 4 | 13.33 | 13.33 |
| | No | 26 | 86.67 | 100 |
| | Total | 30 | 100 | 100 |
| 15. Do you get any financial Support from feed companies? | Yes | 8 | 26.67 | 26.67 |
| | No | 22 | 73.33 | 100 |
| | Total | 30 | 100 | 100 |

From Table 1, Table 2 and Table 3, it is found that most of the farm owners agreed with capital shortage during the COVID-19 pandemic. The optimum capital did not supply during the proper time of production. Most farm owners also agreed that the optimum production level is hampered due to a lack of forecasting policy regarding the market demand for the product. Here, producers showed their dissatisfaction with the government's local livestock agency. Because they think that the agency did not pay any attention to the poultry producer to mitigate losses during the COVID-19 pandemic. Respondents showed quite a dissatisfaction towards NGOs and feed companies. They did not come forward to help poultry producers to limit losses. Respondents strongly agreed that the fluctuation of the market price of poultry products caused significant damage in the poultry sector during the COVID-19 pandemic.

Most respondents did not get sufficient market demand and prices for eggs and chickens. Respondents say there was little scarcity of DOC, poultry feed, medicine, vitamin, vaccination and other input during the lockdown. Relationships between farmers with the hatcheries, feed producers and suppliers were not satisfied. Most respondents did not get any financial support from government, NGOs and feed companies to mitigate losses during the COVID-19 pandemic. Based on the results, the following findings are noted below:

Shortage of Capital due to lockdown and various restrictions on trade and transport hampered poultry production during the COVID-19 pandemic. The value chain system was not properly working due to a lack of capital and proper implementation of regulations and policies during the pandemic period. The lack of transportation facilities and the absence of value chain actors or intermediaries have hampered the appropriate distribution, which has led to the deterioration of farm products and unexpected prices down at the producer level. The lack of proper poultry policy principles was considered a primary restraint to limiting losses of poultry farmers. The relationships among the poultry farmer's associations were not cooperative as the poultry production market price fluctuation caused major damage. Limited access to the veterinary dispensary and minor health care, in the long run, would significantly impact the egg production of the laying birds.

Lack of technical efficiency created a burden to handling the poultry industry properly during the pandemic. Chicken rearing, poultry management, disease handling, production rate and biosecurity of farms were greatly influenced by inadequate knowledge of technology. The improper utilisation of feed, medicine and vaccine during lockdown caused a low production rate and high mortality rate that directly impacted poultry farms. The lack of intense collaboration and participation of government and non-government organisations, academic institutions, and feed industries was a barrier to effective decision-making during the COVID-19 pandemic.

5. Conclusion and Recommendations

This paper aims to assess the impacts of COVID-19 on the poultry sector based on primary data from 141 Layer, Broiler and Sonali farms in the Rajshahi district of Bangladesh. This study reveals some necessary information about the effects of the COVID-19 pandemic based on preliminary findings. This study also focuses on the future challenges of the poultry sector. It sets up some practical recommendations to overcome suffering and hardship and to uplift the present situation of this sector efficiently. Further research would be required to understand the full extent of the impacts that COVID-19 have to impress on this sector in future which is being initiated by this research.

This study implies that the government must develop strategies to prevent and counter the spread of false news and misleading information in anticipation of any future pandemic like COVID-19. Public information campaigns should continue through electronic and print media and other social media and communication platforms to promote the nutritional value of consuming eggs and chicken for health and immunity.

The financial incentives announced by the government must reach vulnerable small and medium-scale poultry farmers. The rapid increase in poultry feed and medicine prices should be controlled. The procedure of getting and repaying bank loans needs to be made more accessible and flexible for the livestock sector as most of this sector's farmers are not educated. Interest-free or flexible repayment-based long-term credit facilities should be ensured for agro-based enterprises to revive from the severe shocks of COVID-19 and run their current business.

Results of this study imply that the government should be declared essential or strategic activities to continue smooth production and marketing during any pandemic like COVID-19. It is also necessary to develop an unhindered and fast transportation system to maintain the proper distribution of agricultural and poultry products around the country. Besides this, the policymaker should establish a constructive pre-plan for rehabilitation and agreement on alternative income-generating activities for stakeholders in this sector affected by any natural disaster in future. Online resources and e-commerce should be extended to connect producers with consumers and explore alternative sales and distribution platforms for poultry and poultry products.

In conclusion, this study's result could be helpful to farmers and researchers in identifying the problems related to the production and marketing of the poultry sector. This study would also help farmers tackle any future pandemic like COVID-19 affecting this sector negatively.

References

- Ali, S. (2020). Poultry Production Falls Alarmingly. Available online at: <https://tbsnews.net/coronavirus-chronicle/covid-19-bangladesh/poultry-production-falls-alarmingly-80857> (accessed 28 December 2020).
- Amin, M. A. (2020). Tackling Coronavirus: PM Announces Tk5,000 crore Package for Bangladesh's Agriculture Sector. Available online at: <https://www.dhakatribune.com/bangladesh/2020/04/12/coronavirus-pm-holds-videoconference-with-district-officials-of-khulna-barisal> (accessed 12 April 2020).
- Berkhout, N. (2020). Bangladesh Poultry Production Plummet. Available online at: <https://www.poultryworld.net/Meat/Articles/2020/5/Bangladesh-poultry-production-plummet-585903E/> (accessed 28 December 2020).
- BPICC (2020). Annual Report: 2019-20, Bangladesh Poultry Industries Central Council, Bangladesh.
- BPICC (2021). Annual Report: 2020-21, Bangladesh Poultry Industries Central Council, Bangladesh.
- DLS (2020). Annual report on livestock 2020. Division of Livestock Statistics, Ministry of Fisheries and Livestock, Farm gate, Dhaka, Bangladesh.
- DLS (2021). Annual report on livestock 2021. Division of Livestock Statistics, Ministry of Fisheries and Livestock, Farm gate, Dhaka, Bangladesh.
- Food and Agriculture Organization (2020a). Mitigating the Impacts of COVID-19 on the Livestock Sector. Available online at: <http://www.fao.org/3/ca8799en/CA8799EN.pdf> (accessed 23 December 2020).
- Hamid, M. A., Rahman, M.A., Ahmed, A., & Hossain, K.M. (2017) Poultry industry in Bangladesh and the role of private sector for its development. *Asian Journal of Poultry Science*, vol.11 (1), p. 1-13.
- Institute of Epidemiology Disease Control and Research (IEDCR), Bangladesh Coronavirus (COVID-19) Update, 2020. Available online at: <http://old.iedcr.gov.bd/> (accessed 24 October 2020).
- Islam, M.K., Uddin, M.F., & Alam, M. (2014). Challenges and prospects of poultry industry in Bangladesh. *European Journal of Business and Management* Vol.6, p.116-124. Available online at: <https://www.iiste.org/Journals/index.php/EJBM/article/view/11443/11790>.
- Khan, M. R. (2021). Lockdown Deals Fresh Blow to Poultry Farmers. Available online at: <https://www.thedailystar.net/business/economy/news/lockdown-deals-fresh-blow-poultry-farmers-2079333> (accessed 24 April 2021).
- Mahmud, N. (2020). Coronavirus: Local Poultry Industry Facing a Massive Loss. Available online at: <https://www.dhakatribune.com/health/coronavirus/2020/04/03/coronavirus-local-poultry-industry-facing-a-massive-loss> (accessed 28 December 2020).
- MOFL-Ministry of Fisheries and Livestock (2020b). Due to the Outbreak of Nobel Coronavirus, the Formulation and Management of Refinancing Schemes Worth

BDT 5,000 Crore for the Provision of Working Capital in the Agricultural Sector. Available online at: https://mofl.gov.bd/sites/default/files/files/mofl.portal.gov.bd/divisional_noc/9646112a_e6ab_47cd_8361_03885933294d/Bangladesh%20bank.pdf (accessed November 2020).

OHPH, 2020. Annual Report: 2020, One Health Poultry Hub, Bangladesh.

Saeque, M. A. (2020). Mitigating the Impact of COVID-19 on Poultry Sector. Available online at: <https://www.aci-bd.com/all-news/mitigating-the-impact-of-covid-19-on-poultry-sector.html> (accessed 26 December 2020).

Satter, A. A., & Mahmud, R. (2021). COVID-19 Impact on Poultry Production and Distribution Networks in Bangladesh. *Frontiers in sustainable food system*, 25 August 2021. Available online at: <https://doi.org/10.3389/fsufs.2021.714649>.

The Financial Express, Dairy Farmers in Trouble, Seek Govt. Support, 2020. Available online at: <https://thefinancialexpress.com.bd/trade/dairy-farmers-in-trouble-seek-govt-support-1585369478>. (accessed 5 February 2020).

World Health Organization (2020b). Bangladesh COVID-19 Situation Report No. 4. Available online at: https://cdn.who.int/media/docs/default-source/searo/bangladesh/covid-19-who-bangladesh-situation-reports/who-ban-covid-19-sitrep-04.pdf?sfvrsn=69b6d931_8 (accessed 23 December 2020).