



Research article

Impact of COVID-19 on poultry market in Bangladesh

Md Ruhul Amin, G.M. Monirul Alam^{*}, Mst Tania Parvin, Debasish Chandra Acharjee*Department of Agribusiness, Faculty of Agricultural Economics and Rural Development, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Gazipur -1706, Bangladesh*

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ABSTRACT

As a result of COVID-19 spread, Bangladesh implemented a range of measures including general holidays, lockdown, no lockdown, and strict lockdown which resulted in the dramatic ups and downs of the price level of the products. This study aimed to examine the influence of COVID-19 on poultry products (meat and eggs) in Bangladesh using Gazipur-an intensive poultry growing area – as a case study. Monthly market price data of poultry meat and eggs, and primary panel data from the same respondents using a random sampling technique through a structured questionnaire-based interview, Focus Group Discussion (FGD), and Key Informant Interview (KII) were collected. The results reveal that after the incidence of COVID-19, the price of poultry products at farmgate, wholesale and retail levels dropped drastically for the first three months (February to April 2020). Following that, the market price of farm (broiler) chicken and eggs increased by 40% and more than 30%, respectively. On the other hand, the price of local (*deshi*) chicken increased by 15%, which was already high on the market. However, in the early phase of COVID-19, many smallholder poultry farmers and hatchery owners were forced to shut down due to less demand/no demand of the product along with high feed cost and inadequate support from external sources. The government should provide financial support with low or no-interest rate to the smallholder growers in order to enhance their resilience against shocks like COVID-19 pandemic, natural disasters, etc.

1. Introduction

Bangladesh's economic prosperity relies heavily on the expansion of its livestock and poultry sectors which in turn helps in creating jobs and to alleviate poverty across the country [1–6]. Commercial poultry farming is becoming increasingly popular in Bangladesh, and new farms are springing up all throughout the country, particularly in and around the country's urban areas [1,7]. The Bangladeshi poultry sector has undergone a significant transition over the past two to three decades due to the country's improved socio-economic condition and a more favorable approach toward meeting nutritional needs [1,8].

Poultry farms sprang up as a result of Bangladesh's rising urbanization and wealth growth and resulting in extensive demand for meat and eggs. All religious, economic, social, and demographic groups have acknowledged the poultry industry's contribution to the nation's supply of high-quality, healthy animal protein in the form of meat and eggs [1,3,9,10]. People in Bangladesh eat a lot of pulses, fish, and meat [11], with poultry accounting for about 20% of protein intake and 35.25% of total meat supply [6,12,13]. The chicken population is dominant among poultry species, at almost 90%, followed by ducks (8%) and a small number of quail, pigeons, and geese [6]. An understanding of small-scale poultry agriculture and the backward-forward links within the poultry supply chain is

^{*} Corresponding author.

E-mail address: gmalam@bsmrau.edu.bd (G.M.M. Alam).

required to fulfill specific policy goals such as poverty alleviation, sustained growth, inequality reduction and national food security [14].

As a result, there is growing interest in establishing an efficient poultry supply chain to assure the industry's continued growth and prosperity for all of its participants. In delivering poultry meat to customers, each market stakeholder contributes a unique puzzle piece. As a result, there is always a value chain in action. A wide range of activities involved in various production and marketing stages are linked throughout the process [15,16]. In addition, various organizations and actors are involved in the backward-forward linkage process [17].

In Bangladesh, only the marketers' association is in charge of effective governance regarding poultry production and marketing at the household level. There is little to no coordination between the various players in the marketing chain. Furthermore, no public institutions are involved in the import, export, production, marketing and processing, and biosecurity, particularly for small-scale poultry producers [18]. Achieving profitability and productivity while minimizing environmental impacts is a challenge for poultry farms in normal times.

Agricultural production in Bangladesh, particularly poultry industry, has been negatively affected by a newly emerged severe acute respiratory diseases-2 (SARS-CoV-2) called the Coronavirus Disease-19 (Shortly, COVID-19) which caused a pandemic effect all over the world for the past two years [19]. Although scientists and authorities have tried to control the COVID-19 pandemic, the situation is still critical due to several global control strategy challenges. The government of Bangladesh also attempted to prevent agriculture from being affected by the pandemic. However, market data reveals that this effort was not entirely successful. As medical waste was dumped into waterways during the early stages of the COVID-19 outbreak [20], there was a notion that fish could carry the virus [21], leading people to turn to meat and pulses as protein sources. Another rumor was that poultry could be infected with the COVID-19 virus [22–24], which further hurt the poultry industry. As a result, market demand and speedy sales were badly affected in the poultry sector this time around [23,25]. Consequently, a rise in consumer price level was noted [22,26–29]. This price increase nearly doubled in developed nations like the USA [30]. Additionally, the supply chain for poultry was severely hampered by restrictions on human movement and logistics [24,31,32].

Burgeoning studies have assessed the impact of COVID-19 on crop, fish and livestock market [1,19,22,25,28,33–35]. Some global research pertinent to COVID-19 and the poultry sector were discovered from the following countries: India [22,23], Canada [32,36], China [32], Nigeria [26], Iran [37], Kuwait [31], England, Italy, Brazil, Germany, Saudi Arabia, Egypt [28], Myanmar [27], USA [28,34], and Poland [38]. However, very little study has been conducted in Bangladesh on the early-stage impact of pandemic on poultry production and marketing [35], and on poultry farming practices and constraints faced by farmers [39]. Smallholder poultry growers in Bangladesh face challenges due to a lack of backward-forward linkages, which is exacerbated by the prevalence of COVID-19. Though incidents like COVID-19 are uncommon, farmers in developing nations frequently experience comparable challenges and undergo slow recovery and growth, necessitating immediate policy intervention to better their situation. It appears that actors involved in the poultry sector went through ups and downs for the last two years of the COVID-19 pandemic [24,40,41]. Considering the importance of poultry sector in Bangladesh, this study focused on understanding how the poultry business operates in the market during COVID-19 and identify existing obstacles and possible solutions to overcome these in an effort to support the smooth growth of the sector in the country.

2. Methodology

2.1. Data

For data collection, the study used a mixed-method approach (quantitative and qualitative data), which included a structured interview schedule-based survey method (face-to-face interviews with the household head), focus group discussion (FGD), and key informant interviews (KII). In each upazila, six focus group conversations with 7–10 family heads were held. Furthermore, conversations with government agricultural officers and workers from non-governmental organizations (NGOs) were held. The sessions' primary goals were to help finalize the interview schedule and get qualitative feedback on the problem and prospects of poultry production and marketing. The information acquired from the surveys and key informant interviews was then cross validated using these opinions.

Data were collected in three stages for this investigation. The initial primary survey was performed in January–February 2020, prior to COVID strike through face-to face interview using structured questionnaire.¹ Before data collection, verbal consent was taken from the respondents. The second period of data collecting took place over the phone during the COVID surge from mid-April until May. After more than a year, the final phase of primary data collection began in September 2021 and continued on a monthly basis until May 2022. Gazipur Sadar Upazila in the Gazipur district (Fig. 1) was chosen purposively as the study region due to the higher concentration of poultry enterprises as well as smallholder poultry farmers as compared to other districts of Bangladesh [42] along with better communication system with the capital city Dhaka [43] which facilitated the data collection even in the presence of COVID-19. The stratified random sampling approach was used to pick samples. Empirical data for market flow analysis was collected from 250 different stakeholders who normally commercialize (i.e., connect the final product with the market) poultry items (meat and egg) in the market.

¹ Questionnaire can be found upon request.

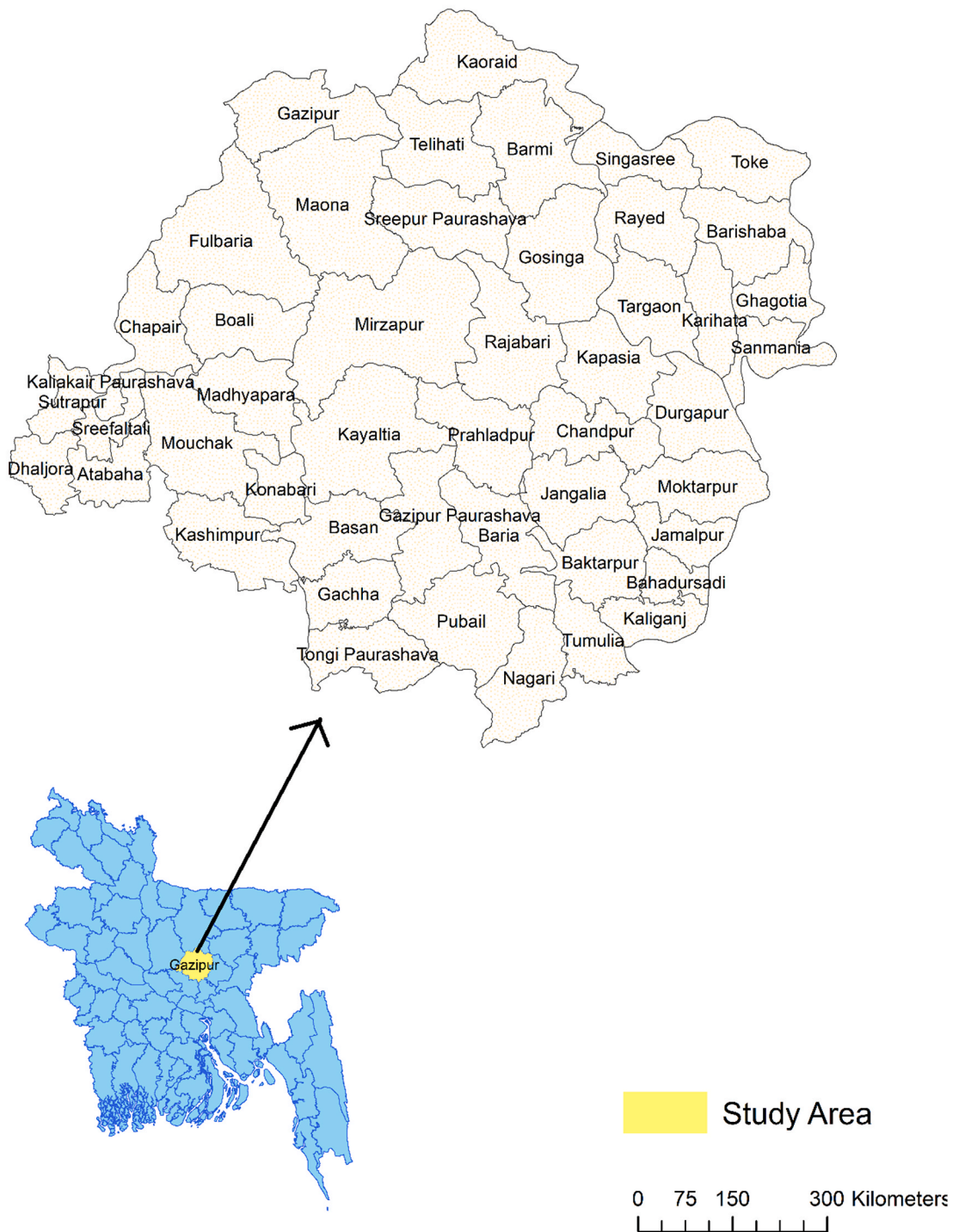


Fig. 1. Study area (Gazipur district).

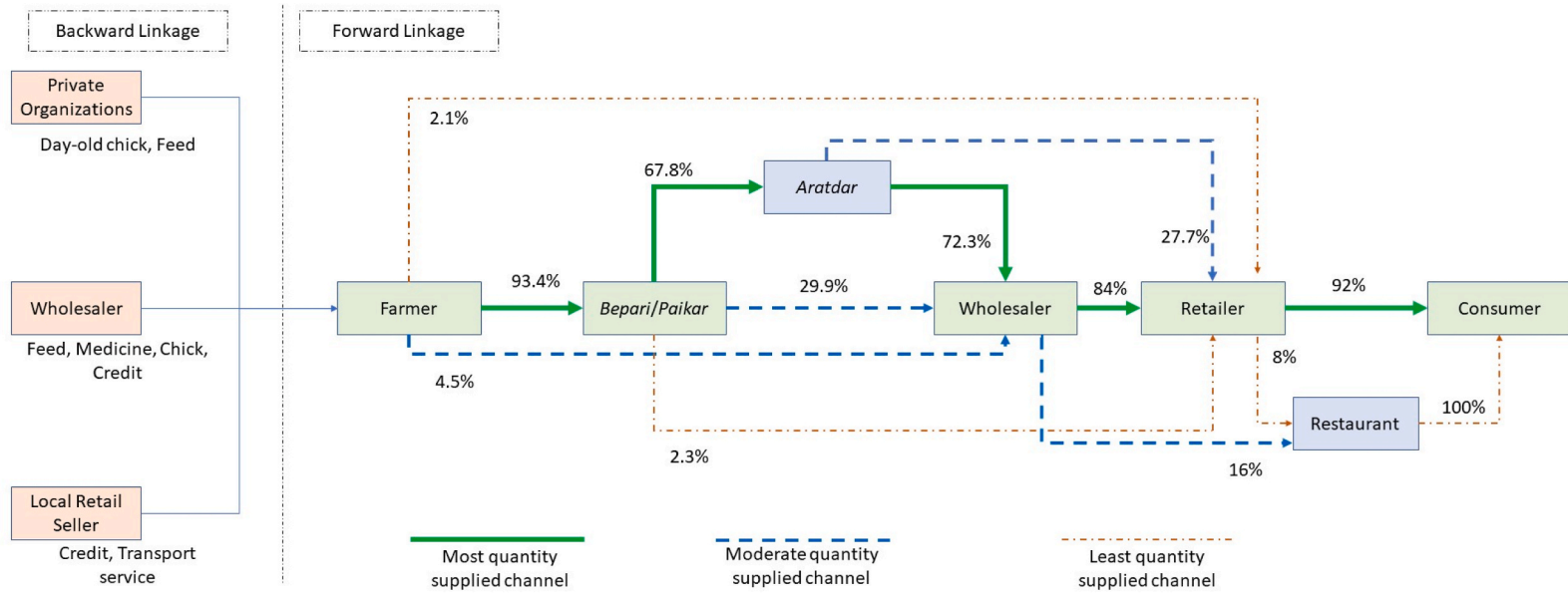


Fig. 2. Backward-forward linkage of poultry sector in the study area (value in parentheses indicates percentage of supply).

In addition to primary data, secondary data was gathered from numerous sources including journal articles, policy papers, reports, the Bangladesh Bureau of Statistics, and the Department of Agricultural Marketing.

2.2. Analytical approach

2.2.1. Price ratio

The pricing of February 2020 was used as the basis month, assuming the pre-COVID-19 situation as normal. The ratio was established by dividing each month's price by the base price. This ratio depicts how the price of poultry and poultry products (egg) in Bangladesh has changed over time.

2.2.2. Constraint facing index (CFI)

For the production and marketing stages, the constraint facing index (CFI) was determined individually. The market participants' constraints were evaluated from low to high. The extent value was used to weigh the response of stated constraints.

$$CFI = \frac{C_h \times 3 + C_m \times 2 + C_l \times 1}{N}$$

Finally, constraints were ordered against their determined CFI value in order to determine the most important constraining factors [44,45]. Tabular analysis was used to determine the most important solution to deal with these constraints.

3. Results

3.1. Poultry market flow in the study area

In Bangladesh, the structure of the poultry market is nearly identical because of the nature of the final products [6]. Local poultry (*deshi*) meat and eggs are highly perishable, fragile, and in almost constant demand in the market. Bangladesh's Department of Livestock Services found that the country had already met its domestic meat and egg needs [9]. The supply chain for our study, shown in Fig. 2, demonstrates that some stakeholders operate behind the consumers' backs to create a smooth and efficient procedure for chicken producers. Backward players in the poultry supply chain for broilers and layers are private farms that sell day-old chicks to farmers.

In some cases, local wholesalers/*beparies*, wholesalers/*paikars*, and even retailers provide critical contractual help, financial support, or logistical support to poultry farmers. In the study area, 65% of farmers solely rely on private organizations for their broiler chicks, while 33% farmers collect half of their chick supply from private farms. According to field survey, wholesalers are the primary source of raw materials for 30% of local (*deshi*) chicken farmers and 15% of broiler farmers (Fig. 2). Besides, private organizations provide day-old chicks to 85% of layer farms. All transactions between stakeholders are typically based on market price and mostly in cash, with some daily post-paid method. Nearly 96% of farmers reported that they had no complaints about the transaction methods they used. According to the data, wholesalers, *paikars*, and *beparies* who buy in bulk have the opportunity to get their hands on the entire harvest from the farmers.

Retailers, wholesalers, *aratdars*, and consumers all play an important role as buyers of farm products in the study area. The *beparies* sell chicken and eggs to *aratdars* who in turn sell them to retailers and restaurants. The *beparies* usually buy from poultry farmers and a small amount from other *beparies*. Retailers occasionally sell to *paikars* as well as restaurants, local superstores, and consumers, but this is the exception rather than the rule.

However, the marketing system of poultry in Bangladesh faced tremendous challenge due to countrywide COVID-19 pandemic. Nationwide general holiday announcement and time-to-time lockdown led to a temporary standstill in the transportation of day-long chick both to and from the producer and supplier. Additionally, limited business hour, high feed cost for rearing a large number of unsold birds for more days, lower income from reduced business volume and failure to reduce the cost of living caused immediate sale of matured poultry birds at a lower price in nearest markets to avoid direct loss of unwanted death of poultry birds. As a result, many small farmers were forced to leave the market. However, the disruption in the poultry sector has been overcome by rest of the actors within a short span of time and in later period they fall short again.

3.2. Pandemic effect on poultry sector

While being on the verge of fourth industrial revolution, the world is moving blazing fast, the world is struck by the pandemic caused by novel corona virus (Covid-19). During the twentieth century, the world knew about the economic crises caused by World War I and II, 1930's economic halt, oil crises, global financial crisis and so on were only examples [46]. Due to this global pandemic, almost every sector of the world has been affected, and Bangladesh, as a developing country, has gone through an unwanted economic fall [47]. The economy of Bangladesh largely relies on agriculture, and to some extent, poultry sector is an important part of it [48].

The effect of COVID pandemic was indirect on the poultry business as the household animals and birds were opted out from being a vector or cause of contamination of the virus [49]. As it spreads due to human respiration and droplets of infected people's cough, nose, and mouth, the impact was directly on the transport sector, production of other raw materials, and labor engagement. Also, the general calls off on all organizations except the country's emergencies lead to an absolute shutdown of all production processes (except agriculture). The control on public gathering, closure of hotels, restaurants, bakeries etc. significantly caused the mismatch between

demand and supply of poultry meat and egg which further resulted in lower income that many small businesses were unable to cope up. Besides, the rumor spread in social media regarding the association of corona virus and poultry birds also hampered the market demand for poultry products during this pandemic [24,33,50]. The following sub-sections describes the effects of COVID-19 on price volatility of egg, farm chicken and local chicken in Bangladesh.

3.2.1. Effect on the egg market

Egg is the most basic nutrition rich food for all classes of people in Bangladesh due to its availability and affordability. Therefore, a change in its price is proportionate with its appeal and livelihood of people [51]. Prior to and during COVID-19, a great fluctuation in egg prices was noticed.

Before the pandemic strike in the country, just before mid-March 2020, the selling price of eggs of *paikars* and retailers were incremental. Just after the inducement, in the end of March, the price ratio has reduced by 3.3% for retail egg sellers, 2.3% for *paikars*/wholesalers and 4.8% for the farmers. After two months of the outbreak, the price started to increase to meet the increased market demand, and reduced market supply, which still was upward moving in the month of July 2020 (Fig. 3). However, the initial price fall was challenge for many marginal egg producing farmers and some of them were wiped out of the scope due to sever economic loss.

This was the scenario for egg price fluctuation while the country was observing general holiday announced due to the COVID surge. At the beginning of lifting general holiday conditions for the upliftment of the national economy, the price ratio of egg in farmgate showed a slight fall, remained stable for a while, and saw a sharp fall within two months of no lockdown condition instead of continuous COVID infection rise in the country. The reduced-price ratio found to be continued for more than five months. From the end of the first quarter of 2021 (April–May), egg price increased again at every level of the marketing as strict lockdown imposed. After the final lockdown ease, the egg price went through massive fluctuation in every month (Fig. 3). At the end of 2021, farmgate prices reached the same level as before the COVID-19 strike. Such a fluctuation at the farm gate level was due to the higher production of egg amid the pandemic situations while sell was lower due to transportation restriction and higher transportation charges. Higher feed cost also led the farmers with no choice but to sell their eggs at a lower rate in the local markets. Wholesale and retail price spikes continued to grow in 2022. Throughout the whole period, wholesale price fluctuations were more elastic than those of other segments, demonstrating the wholesalers' immense market control. Such a rise in price at both wholesale and retail level was caused by the sellers' intention to cover up the losses incurred during the lockdown periods while adjusting the gap in the demand and supply of eggs in the market [24].

3.2.2. Effect on farm chicken (broiler)

Broiler chicken is the first choice of meat for majority of the lower to middle income-group people and this segment comprise largest portion of the consumers in the market. Broiler meat are comparatively cheap in price and widely available [51].

Farmers are the producer of poultry in this study, they purchase broiler chicks from commercial companies and rear it for selling at a higher price. Farmers were the initial seller of farm poultry (broiler). Throughout the whole COVID-19 period, local *aratdars*, wholesalers (*paikars*) were the point of sale of farmers. The transaction took place at prevailing or pre-fixed market price. They sold basically to the same actors all the time and no bargaining usually took place in between which made a steady price for them. After two months of the COVID-19 first patient identification in the country, when country was observing general holiday with limited economic activity, market went through increased demand for broiler that the existing supply failed to fulfill and increased the selling price ratio

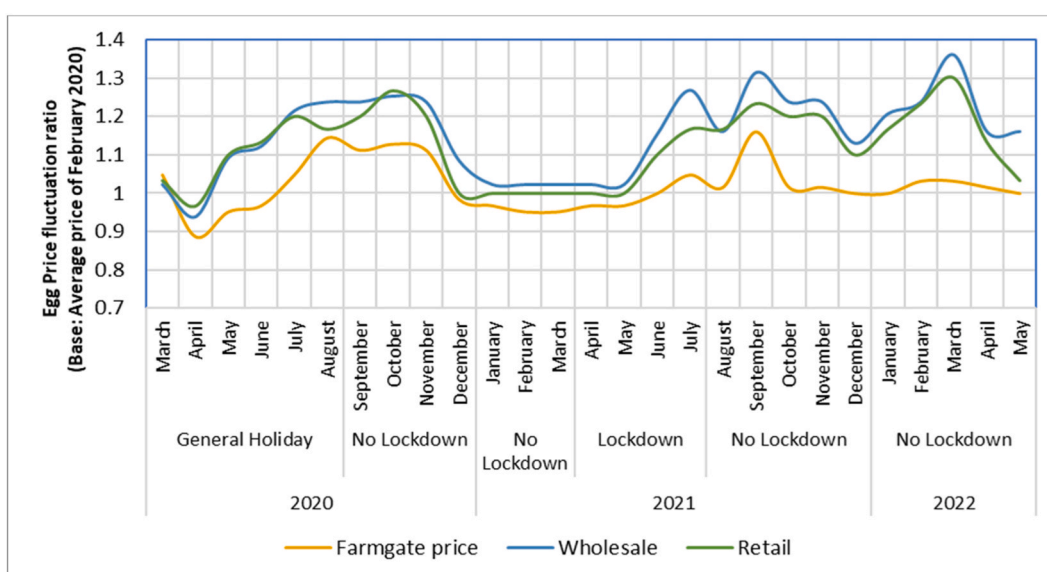


Fig. 3. Egg price fluctuation before and post period of COVID-19 pandemic.

of farm chicken respectively by 12, 47, and 39% for the farmers, wholesalers and the retailers (Fig. 4).

After that, price at all levels showed a slow downfall until ‘no lockdown’ was initiated. The price remained nearly flat for almost five months and started to rise again at the beginning of 2021. In May 2021, during the strict lockdown, demand for broiler meat decreased as rumors spread in social media by linking poultry meat with coronavirus transmission [24,50]. Thus, the regular process of rearing poultry and selling was hampered, which led the poultry farmers to sell at the given price as soon as possible. The risk of waiting was a luxurious decision for smallholder farmers. A sudden vacuum in supply was created and caused a sharp rise in price after lockdown ease. In January 2022, the market price for broiler chickens reached an all-time high, following a period of consistent price increases at all levels. Like the egg price rise, such a rise in broiler price was resulted from the stakeholder’s tendency to cover up the economic loss during the first phases of COVID-19 pandemic. Later in the year, prices tend to decline while remaining above the COVID-19 period maximum.

3.2.3. Effect on local (*deshi*) chicken market

People with high health consciousness put their first choice in *deshi* breed. Local chicken (*deshi*) meat has a higher appeal to consumers, but throughout the pandemic, the market actors illustrated a continuous trend in buying or producing at a lower price but to the next actors or the consumers selling at a higher price (Fig. 5).

In the case of *deshi* chicken, retailers purchased at an average of 53% higher value than farmers selling price and sold at 63% higher than farmers selling price, leaving everyone except consumers in a win-win situation while farmers had the potential to earn more. Despite the fact that the price of local chicken reduced and remained stable for some time following the settlement of the countrywide general holiday issue, a steady price increase over the past two years is evident, culminating in a price spike in the first quarter of 2022.

Just because of additional market actors’ involvement, the consumer level price rose, and the price share of producers decreased (Fig. 5). Throughout the whole COVID-19 period, the profit margin of wholesalers remained high, went through minimum ups and downs. Except the farmers, none of the other actors’ price descended from the base period. The highest price spike was observed in early COVID-19 surge, and again showed a rise after the third wave hit.

Compared to the broiler chicken, the local (*deshi*) chicken price fluctuation appears to be different. People believed that local chicken are healthier than broiler chicken as they are not produced using artificial feeds and antibiotics. *Deshi* chickens are usually fed from homestead which is safer than broiler meat. Therefore, people with higher income were tended to buy more of local chicken than broiler during the COVID-19 period, apart from its high price. Such a buying intention resulted in a steeper demand curve for local chicken. Thus, a higher fluctuation was observed.

When the lockdown due to pandemic is eased, everyone termed this as “new normal” [52,53]. Compared to the prior pandemic market condition, the “new normal” market is more active in price and supply. Although the price is on the rise, the economies of scale on sales have decreased. Actors earn profit by selling at a higher price, while in the first two months of the pandemic, they made a profit based on the quantity of sale instead of price.

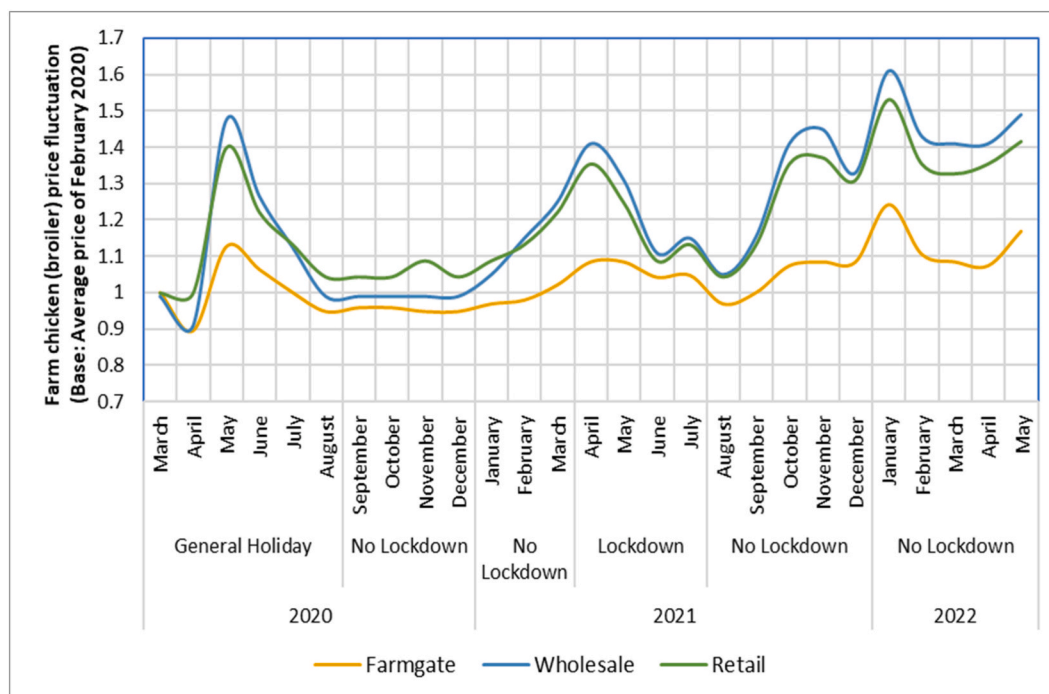


Fig. 4. Farm chicken (broiler) meat price fluctuation in COVID-19 pandemic.

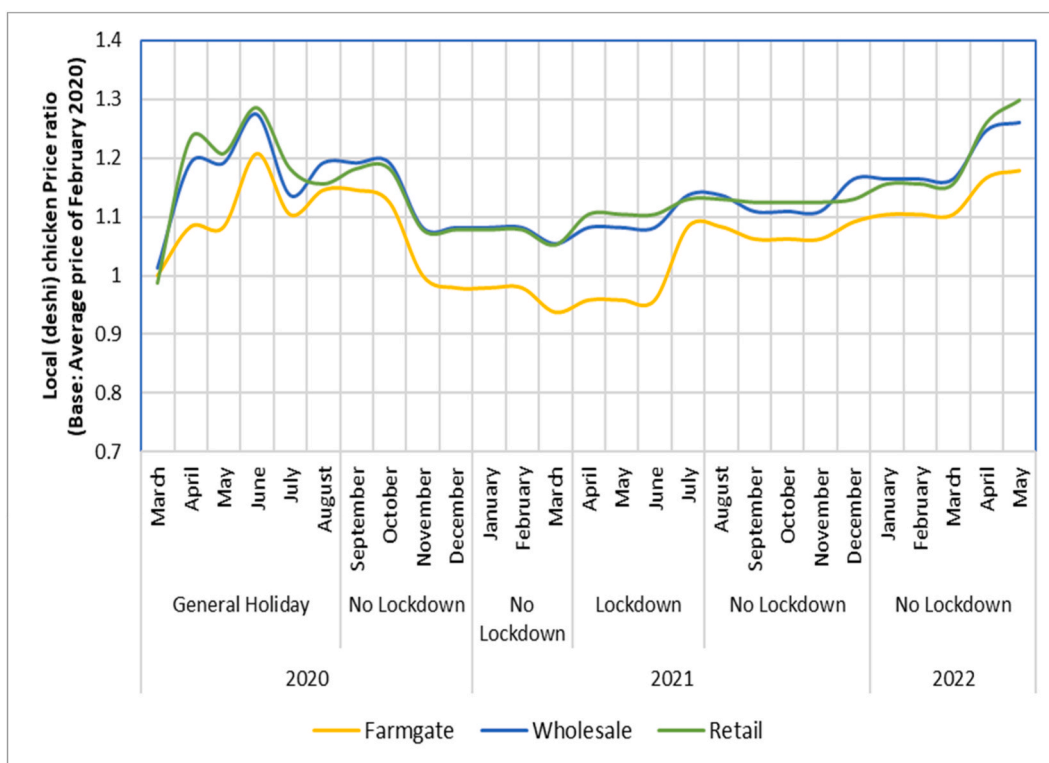


Fig. 5. Local chicken (deshi) meat price fluctuation in COVID-19 pandemic.

3.3. Constraints and suggestions

Operating in a competitive market is not an easy task while many other people are doing the same business, with similar technique, and almost the same strategy. However, to everyone, this is not a fairground. Some face problems that are meant to be a constraint for

Table 1
Constraints faced by poultry farmers (Before and during COVID-19).

Constraints	Before COVID-19						During COVID-19					
	Extents			CF Value	CFI	Rank Order	Extents			CF Value	CFI	Rank Order
	High (3)	Medium (2)	Low (1)				High (3)	Medium (2)	Low (1)			
Lack of capital	39	83	127	249	1.245	9	99	120	75	294	1.47	7
Lack of proper transportation facility	36	84	123	243	1.215	11	30	92	119	241	1.205	12
Lack of market information	33	10	124	167	0.835	16	27	52	117	196	0.98	15
Credit sales	162	188	39	389	1.945	5	69	64	92	225	1.125	13
Demand fluctuations	142	96	63	301	1.505	7	129	104	59	292	1.46	8
Price fluctuation	306	94	39	439	2.195	3	420	72	11	503	2.515	2
High feed cost	285	94	50	429	2.145	4	525	24	5	554	2.77	1
High transportation cost	47	38	155	240	1.2	12	81	64	114	259	1.295	9
Weight loss	51	76	119	246	1.23	10	45	82	118	245	1.225	11
Disease attack	363	104	11	478	2.39	1	348	114	11	473	2.365	3
High demand of native birds	57	92	82	231	1.155	13	24	14	125	163	0.815	16
Lack of extension service	99	105	93	297	1.485	8	69	190	59	318	1.59	6
Lack of government support	72	182	62	316	1.58	6	168	198	31	397	1.985	5
Lack of vaccines at cheap price	343	90	10	443	2.215	2	312	102	15	429	2.145	4
Rumor against poultry products	15	46	120	181	0.905	15	66	54	91	211	1.055	14
Corruption in purchasing raw materials and distribution of poultry products	63	52	93	208	1.04	14	48	86	124	258	1.29	10
Miscellaneous problems	15	6	35	56	0.28	17	12	0	39	51	0.255	17

everyone. Field survey on farmers and traders regarding the production, marketing of poultry birds, revealed significant issues that they suffer from.

3.3.1. Farm level

High cost of feed of poultry, which is also the basic need; continuous price fluctuations in the retail and wholesale market leaving farmers mostly vulnerable; inadequacy of vaccines in the local market, and higher price of vaccines, even if available appeared to be the major constraints of poultry farmers to operate without risk and expand further the line of business (Table 1).

For the constraints mentioned in Table 1, poultry farmers suggested the involvement of the government or administration to maintain regular supply and balanced price while buying feed, vaccines, and selling chicken and egg in the market to ensure farmer's share.

Along with those (Fig. 6), low-cost loans, quality vaccine availability, adequacy of veterinary doctors in rural areas, proper marketing support to reduce marketing cost, government incentives might improve the poultry market and stakeholder conditions in the poultry system.

3.3.2. Trader level

For traders, the constraints are quite different. Force sale on credit, inadequate transportation facility, higher transportation cost, lack of extension services, demand fluctuations but continuous supply, and weight loss if sell takes more time are significantly important issues faced by the traders (Table 2).

Among all these constraints, lack of adequate government support is the most critical factor. While all the government support programs are designed to assist poultry farmers, few exist for traders. In the COVID-19 situation, the need was more drastic.

A consistent supply and stable price are crucial for operating the business efficiently, required at the market level (Fig. 7). Ensuring a consistent, uninterrupted transportation system is important for preventing massive loss for poultry traders. Due to traffic jams, poultry supply is hampered, birds die, resulting in smallholder traders being forced to quit. During the pandemic, these incidents were more prominent.

Although the constraints are hindering the growth of the poultry business, the contribution to the national income from poultry is rising because of the new inclusion of poultry farmers countrywide. Entrepreneurs' preliminary choice is focused on livestock and poultry, which is also a good sign. However, proper actions for getting rid of the mentioned and other non-mentioned barriers are necessary for sustainable development.

4. Discussion

It appears that the poultry industry in Bangladesh is struggling due to a weak backward-forward linkages which is aggravated due to the incidence of COVID-19. Prior research also found that the production of poultry, including chicken and eggs, was impacted along with other agricultural components due to COVID-19 [32,36,54]. The primary stakeholder in this industry is the poultry farmer who suffered most from this impact. Actors typically communicate with each other one-on-one with fixed terms (for example, farmers are compelled to sell their goods only at certain wholesalers). Local *beparies* work with *aratdars* in some areas, as well as wholesalers/*paikars* in others, to control the price and supply of agricultural products. Producers (farmers) are under siege from traders, specifically *aratdar*, wholesaler/*paikar*. As a result, smallholder farmers do not have the courage to seek a better life, and the cycle of poverty continues. Business failure was also revealed in developed countries caused by the distressed sale of poultry products and the

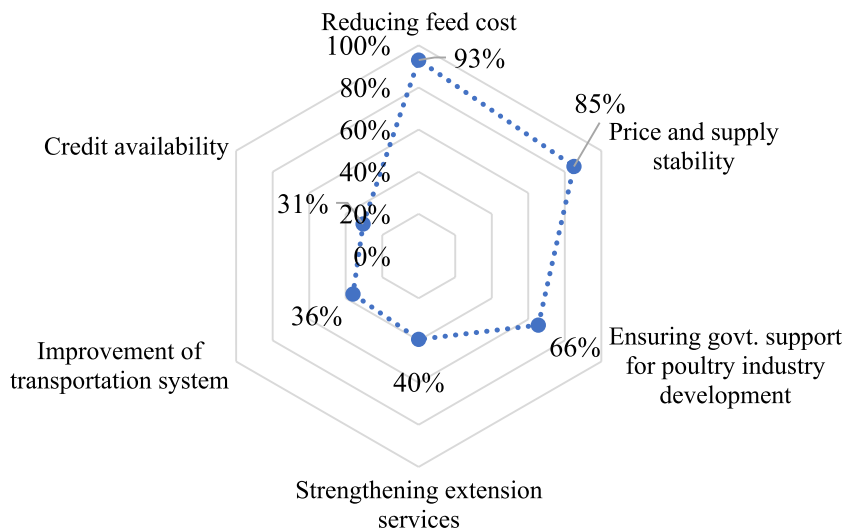


Fig. 6. Possible solutions suggested by poultry farmers.

Table 2
Constraints faced by the poultry traders.

Constraint Items	Extents			CF Value	CFI	Rank Order
	High (3)	Medium (2)	Low (1)			
Lack of Capital	9	18	7	34	0.68	6
Lack of proper transportation facility	6	26	6	38	0.76	4
Lack of market information	6	4	9	19	0.38	10
High feed cost	33	10	1	44	0.88	3
Credit sales	9	20	2	31	0.62	7
Demand fluctuations	27	18	2	47	0.94	2
High transportation cost	6	16	2	24	0.48	8
Weight loss	9	24	4	37	0.74	5
High demand of native birds	0	8	6	14	0.28	11
Lack of extension service	3	20	1	24	0.48	8
Lack of government support	27	26	6	59	1.18	1
Lack of vaccines at cheap price	3	4	5	12	0.24	12
Caused by miscellaneous items	6	0	1	7	0.14	13

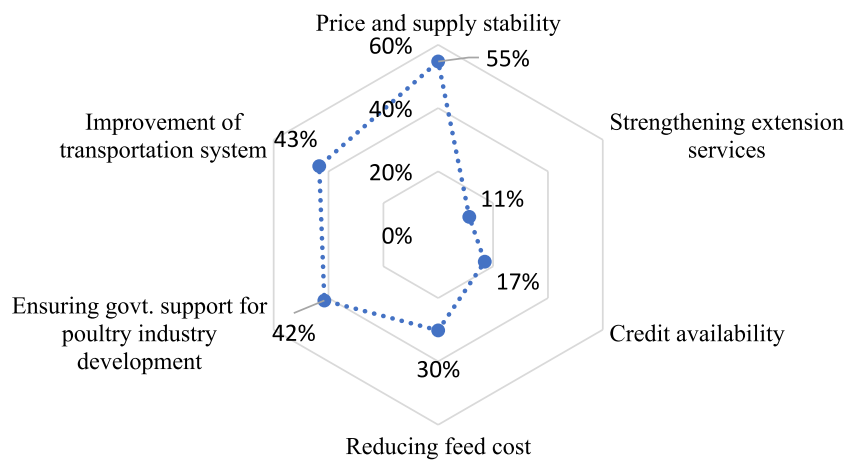


Fig. 7. Possible solutions suggested by traders.

closing of the sales outlet due to COVID-19 [22,31,32,34].

In all forms (egg, broiler meat, and *deshi* chicken meat), the poultry business endured the most critical time while there was no lockdown situation announced after the ‘general holiday’ in 2020 and the ‘strict lockdown’ period in 2021. Lower and middle-class families were particularly hard hit by the devastating pandemic of COVID-19. During this time, being unemployed or underemployed was a constant threat in Bangladesh. Consumers began to view poultry as an unnecessary luxury due to rising prices for basic necessities, which led to a glut of poultry on the market. It had a significant effect. Many smallholder farmers went out of business between first three months of pandemic strike and later in September 2020 and June 2021, as shown in this study. In all marketplaces, farmers were primarily price takers and retailers in the chicken market, and wholesalers and retailers in both the chicken (broiler and *deshi*) and egg market had sufficient pricing authority. It is also reported that the cost of necessary poultry medications, vaccines, and treatments increased, resulting in a significant number of deaths and a loss of farm income [23].

Even though there were no restrictions for the first seven months of the specified time frame, rumors about the poultry industry, high feed prices, and consumers’ reluctance to purchase chicken as a meat source caused the price ratio to fall. Lack of foresight and uncontrolled farm expenditures contributed to the deterioration. However, in later periods, the price rise was beyond control. Some smallholder farmers benefited from the government’s decision to support agriculture; however, this support was insufficient. Supporting poultry farmers and small traders with low-interest loans is essential right now if Bangladesh is to reestablish this industry after the conflict and achieve the country’s vision 2041, which includes eradicating poverty, eliminating hunger, and improving people’s health and well-being.

Stability in the market, a weak system for transporting live poultry, an unchecked rise in the price of feed, and insufficient government support for smallholders are all factors limiting the growth of the poultry industry. As a result, those who work in this field are constantly on the lookout for quick fixes to stay afloat. However, the poultry industry could be saved if the government intervenes with policies aimed at the sector.

5. Conclusions

In Bangladesh, many people are involved in the poultry industry's supply chain, both backward and forward. When the worldwide pandemic of COVID-19 struck, it wreaked havoc on Bangladesh's poultry industry and other income and revenue sources. The study reveals that due to COVID-19 there was a sharp drop in the price of poultry products at the farm, wholesale/*paikar* (an important middleman) and retail level for a short period of time (around three months), and then a sharp rise in price took place. Eid-ul-Fitr, a religious festival, in every year facilitated this rise. This festival forced almost every family to return to their normal purchasing habits because poultry consumers are mainly middle- and lower-income earners. Many other factors (such as the price of substitute food items, the abundance of outlets, food consumption patterns, etc.) were also responsible for the recovery and rapid rise in poultry product prices. However, due to the spread of COVID-19, many smallholder poultry farmers and hatchery owners were compelled to close down due to a decrease in market for their products or a complete lack of demand. There are severe obstacles for poultry actors including low funding, high transportation costs, a lack of extension services, high feed costs, fluctuations in market demand, disease infestation, high vaccine prices, and a scarcity of vaccines. The best way to deal with the situation is to involve government agencies in poultry market management, misguided news control, vaccine and feed cost reduction and quality control. Decentralizing market power from individual market actors is required to keep consumer-level prices under control, and proper management is essential in this regard. The government should offer smallholder farmers with low- or no-interest loans to increase their resistance to shocks such as the COVID-19 pandemic, natural disasters, etc.

Author contribution statement

Md Ruhul Amin: Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

G.M. Monirul Alam: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Mst Tania Parvin; Debasish Chandra Acharjee: Contributed reagents, materials, analysis tools or data; Wrote the paper.

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Data availability statement

Data will be made available on request.

Declaration of interest's statement

The authors declare no competing interests.

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