ASSESSING COVID-19'S EFFECTS ON FARMERS USING A PHONE SURVEY IN THE FEED THE FUTURE ZONE OF INFLUENCE IN BANGLADESH

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ACRONYMS

BIHS	Bangladesh Integrated Household Survey
GFSS	Global Food Security Strategy
GoB	Government of Bangladesh
IFPRI	International Food Policy Research Institute
IMED	Implementation, Monitoring, and Evaluation Division
MSME	Micro, small, and medium enterprise
NGO	Non-governmental organization
PKSF	Palli Karma Sahayak Foundation
PRSSP	Policy Research and Strategy Support Program
PSU	Primary sampling unit
USAID	United States Agency for International Development
ZOI	Zone of Influence
ZOR	Zone of Resilience

EXECUTIVE SUMMARY

The Bangladesh Policy Research and Strategy Support Program (PRSSP), implemented by the International Food Policy Research Institute (IFPRI), designed and conducted a telephone survey to capture the effects of COVID-19 on farmers during the first five months after the coronavirus outbreak began in Bangladesh. This report provides the survey's findings, with particular attention to access to credit and assistance and supply chain disruptions (e.g., labor shortages, access to agricultural inputs, selling prices of outputs, etc.).

Access to Credit and Assistance

In April 2020, the Government of Bangladesh (GoB) announced a low-interest loan for those in agriculture and micro, small, and medium enterprises (MSMEs) to mitigate the economic impacts of the COVID-19 pandemic. Among the 60 percent of surveyed farmers who heard about the GoB's low-interest loans, only 5 percent applied and less than 1 percent received the loan. About one-third (30.3 percent) did not know how to apply. This suggests that more work is needed to remove barriers that inhibit farmers from applying.

More farmers received any COVID-19-related cash assistance (7.7 percent) than agriculture-related assistance (5.4 percent). For farmers who received agriculture-related assistance, this was mostly provided by the GoB, in-kind, and was provided in the immediate months following the outbreak.

Rice Farming

IFPRI's farmers' phone survey examined the effects of the COVID-19 pandemic on boro and aus rice farmers in the ZOI.

Boro Farmers

Over one-quarter (27 percent) of boro farmers sold paddy in May. Nearly all (95 percent) farmers sold boro paddy to traders in the immediate months after the outbreak. Despite prices being relatively lower in the initial months after the outbreak, more farmers sold during this timeframe, possibly due to financial pressure farmers face to pay back loans. Interestingly, on average, farmers interviewed reported higher farmgate prices for boro paddy this year compared with last year.

One-fifth (20 percent) of boro farmers faced labor shortages. While ZOI farmers typically hire labor from outside their own district to assist with harvesting, 42 percent of boro farmers (who hired from out of district last year) reported that this type of labor was unavailable for hire this year while another 40 percent hired less than the previous year due to COVID-19-related movement restrictions. Moreover, 44 percent of boro farmers reported higher agricultural labor wages in 2020 than 2019.

Aus Paddy Farmers

Among aus farmers who sold any paddy in 2020, 17 percent sold in August 2020, which coincides with the harvest period. Fewer aus farmers (14 percent) experienced labor shortages compared with boro farmers (20.1 percent), likely because the aus paddy harvest is later in the year, when lockdown was not enforced. Aus farmers also faced shortages in agricultural inputs, more so for seed and fertilizers than pesticides. As inputs became more scarce, prices increased, particularly for agricultural labor and seed.

Farming of Non-Rice Crops

IFPRI interviewed banana, brinjal, flower, and jute farmers from the ZOI to assess the effects of the pandemic on their production and marketing practices. The ZOI farmers had unique experiences based on the crop they cultivate, yet two notable commonalities emerge:

First, a relatively high proportion of non-rice crop farmers across the different crops could not sell for at least one month due to natural calamities between April and August 2020. Weather-related hazards, particularly flooding in July and August 2020, exacerbated the already negative effects of the COVID-19 pandemic on the agriculture sector.

Second, shortages in agricultural inputs—namely, seed, fertilizer, and pesticide—were relatively prevalent, particularly in the immediate months after the COVID-19 outbreak. Scarcity in agricultural inputs increased prices. The proportion of farmers affected by these price hikes varied by non-rice crops.

Banana Farmers

Among banana farmers who sold bananas in 2020, 28 percent were not able to sell due to natural calamities, particularly in July and August 2020. A relatively higher proportion of banana farmers faced shortages in seed (8 percent) compared with other agricultural inputs. Despite relatively higher shortages for seed, more banana farmers reported higher prices for fertilizer and pesticide. Higher prices for these agricultural inputs were more commonly reported in April and May, when supply chain disruptions were more pronounced immediately following the outbreak and 'general holiday' was enacted.

Brinjal Farmers

Brinjal farmers also struggled to sell their crop due to natural calamities, mostly in August 2020 when there was flooding. A higher proportion of brinjal farmers were affected by agricultural input shortages and, in turn, higher agricultural input prices, with 14 percent reporting higher seed prices, 11 percent for fertilizer, and 15 percent for pesticide between April and August 2020.

Flower Farmers

During the farmers' phone survey sampling process, *gada* (marigold) and *rajanigandha* (tuberose) flowers were identified as the most widely cultivated flowers in the ZOI sample. The phone survey results show that these two flower varieties presented unique challenges from one another.

For instance, more *gada* flower farmers faced agricultural input shortages than *rajanigandha* flower farmers, which indicates that farmers of different crops and possibly different varieties of the same crop require a unique approach to ensure assistance is properly targeted. Additionally, *gada* flower farmers faced greater shortages in seed, then fertilizer, and then pesticide, whereas *rajanigandha* flower farmers experienced the exact opposite.

Jute Farmers

Most farmers who sold any jute did so in August 2020, with an average monthly selling price of Tk 51.4/kg in that month. Encouragingly, prices were relatively higher in 2020 than in 2019. Nevertheless, jute farmers in the ZOI faced many of the same challenges as other farmers amid COVID-19: agricultural labor shortages affected one-fifth of jute farmers, and two-fifths of jute farmers reported higher labor wages compared with the same time last year. A relatively low proportion (4-5 percent) of jute farmers in the ZOI reported shortages in seed, fertilizer, and pesticide between April and August 2020.

Non-Crop Agriculture

IFPRI's farmers' phone survey interviewed dairy, fish, and poultry farmers in the ZOI.

Dairy Farmers

Dairy farmers were hard-hit by the COVID-19 lockdown, particularly by a lack of buyers. The average selling price of milk in February 2020—before the COVID-19 lockdown—was Tk 44.76/liter, which declined in the immediate months following the outbreak. During this time, half of the dairy farmers reported milk went unsold and over one-third (36.0 percent) distributed milk for free. By August 2020, after the COVID-19 lockdown was lifted, the average selling price rose above the pre-pandemic rate (Tk 46.70/liter).

Dairy farmers experienced acute shortages in key agricultural inputs from April to August 2020. One-fifth reported shortages in cattle feed, particularly in April and May 2020. Shortages in veterinary services (13 percent) and medicines for cattle (9 percent), while not as widely reported as shortages in cattle feed, are greatly concerning given that an inability to treat ailments or injury can result in illness or death, which, in turn, raises long-term, debilitating consequences on the income-earning potential of ZOI households.

Fish Farmers

The farmers' phone survey findings present a similarly concerning composite of fish farmers in ZOI in the immediate months following the COVID-19 pandemic. Over one-third (36 percent) of fish farmers in the ZOI reported shortages in fingerlings, followed by 22 percent in feed, and 16 percent in medicine.

Poultry Farmers

The average monthly selling price of eggs dipped in April and May 2020, yet rebounded by July 2020 to above the pre-pandemic monthly price of eggs. Although egg farmers appear to be relatively less

affected than dairy farmers, 17 percent of ZOI egg farmers had eggs go unsold or were distributed for free between April and August 2020. As a testament of the desperation and inability to sell amid the pandemic, 8 percent of egg farmers reported discarding their eggs entirely at some point in the months following the outbreak. An alarmingly high percentage of poultry farmers faced shortages in critical inputs, including poultry feed (38 percent), veterinary services (24 percent), and medicine (15 percent), particularly in the immediate month following the outbreak.

1 MOTIVATION

Bangladesh has made remarkable development gains over the past several decades, but the escalation of the coronavirus outbreak threatens to undermine this progress. On March 8, 2020 the first 3 COVID-19 cases were identified in Dhaka. In response, the Government of Bangladesh, along with other countries around the world, imposed policy measures to stop the spread of the virus. On March 16, schools were closed, and localized lockdowns began on March 18. The Bangladesh Government announced a 10-day 'general holiday' from March 26 to April 4, during which everyone was expected to stay home, avoid non-essential movements, and practice physical distancing, except for essential workers. The population movement measures were iteratively extended in phases through May 31. These efforts have resulted to serious disruptions in the economy and livelihoods.

The Bangladesh Government and development partners rapidly mobilized resources to mitigate the impacts of COVID-19. For example, the Government of Bangladesh has implemented various measures to mitigate the impacts of COVID-19 on farmers. In April 2020, the Prime Minister announced a Tk 50 billion (US$590 million) stimulus package with a 4 percent discounted interest rate (from 9 percent) on loans for farmers who are severely affected by the ongoing COVID-19-related 'general holiday.' As of August-September 2020, a significant portion of this stimulus package had not yet been disbursed (Hasan 2020; Hossain 2020).

Adopting a sound COVID-19 response requires reliable, up-to-date data. To this end, upon request from the United States Agency for International Development (USAID), the Policy Research and Strategy Support Program (PRSSP), implemented by the International Food Policy Research Institute (IFPRI), proposed to conduct a series of telephone surveys to document the effects of COVID-19 on key populations of interest in the Feed the Future Zone of Influence (ZOI). IFPRI-PRSSP designed and conducted the first—a socioeconomic phone survey—to document changes in socioeconomic and food security characteristics during the three months following the onset of the COVID-19 pandemic. The socioeconomic phone survey report was submitted to USAID in August 2020.

Coronavirus has severely disrupted food value chains and, in turn, the livelihoods of Bangladeshi farmers in crop and non-crop agriculture. To date, there has been minimal rigorous research designed and conducted to quantify the effects of coronavirus on farmers in USAID's Feed the Future ZOI. To this end, IFPRI-PRSSP conducted the second phone survey to measure the changes among farmers during the five months following the onset of the COVID-19 pandemic.

This phone survey report provides insights from crop, dairy, poultry, and fish farmers in the ZOI, focusing on the effects of COVID-19 on farmers' access to credit and agriculture-related assistance from the government, any disruptions in the inputs market (prices and availability of seeds/fertilizer/pesticides, as well as animal feed) and the agricultural outputs market (as reflected in prices; not being able to sell; lack of buyers; and various other indicators). This evidence has the potential to inform recommendations for enabling farmers to mitigate and recover from COVID-19-related shocks and

strengthen the resilience of Feed the Future households, in line with the US Global Food Security Strategy (GFSS) Bangladesh Country Plan.

2 METHODS AND DATA

The farmers' phone survey sample was drawn from three datasets: (1) the 2018/2019 Bangladesh Integrated Household Survey (BIHS), which was conducted from November 2018-March 2019 and is nationally and regionally representative of rural Bangladesh; (2) the 2018/2019 Feed the Future stratum of the BIHS, which is representative of the Feed the Future ZOI; and (3) the 2018/2019 US Global Food Security Strategy (GFSS) baseline survey samples. The farmers' survey samples for this report were primarily drawn from the Feed the Future ZOI stratum survey and the GFSS baseline survey conducted in the Zone of Resilience (ZOR). A sound and appropriate statistical method was used to calculate the sample size for both surveys.[1] Sampling designs for these two surveys are summarized below.

The Feed the Future ZOI stratum is a part of the BIHS. The sample design of the BIHS followed a stratified sampling in two stages—selection of primary sampling units (PSUs [that is, villages]) and selection of households within each PSU—using the sampling frame developed from the community series of the 2001 population census of Bangladesh. Later, sampling weights were adjusted based on the latest population census of 2011. The domain of the Feed the Future ZOI is 120 upazilas in 20 districts. In the first stage of BIHS sampling, PSUs were allocated to the Feed the Future ZOI stratum with probability proportional to size (size being the number of households in each stratum). In the second stage, a complete census in each of the selected PSU (village) was conducted and 20 households were randomly selected from each PSU from the census list of households. The 2011/2012 baseline sampling frame of the ZOI includes 2,040 households in 102 PSUs belonging to 73 upazilas. The Feed the Future ZOI endline survey in 2018/2019 surveyed the same households from the baseline survey conducted in 2011/2012, making a panel dataset. Due to attrition, household merges, and household splits, the total number of Feed the Future ZOI households under the 2018/2019 endline survey was 2,064.

The 2018/2019 GFSS baseline survey included a representative, random sample of the entire population living in the ZOR. In addition to the 20 districts forming the Feed the Future ZOI, the GFSS ZOR added Kushtia district. The domain of the GFSS ZOR is 126 upazilas in 21 districts. As was done for the BIHS, the sample design followed a stratified sampling in two stages: (1) randomly select 125 PSUs (villages) with probability proportional to size sampling using the number of households in each village as the size, and (2) after a complete census in each of the selected villages was conducted, randomly select 20 households per PSU from the census list—using the sampling frame developed from the community series of the 2011 population census of Bangladesh. The 2018/2019 GFSS baseline survey sample includes 2,500 households in 125 PSUs.

Between August 10 and 21, 2020, IFPRI hired and trained 42 experienced enumerators (25 men, 17 women), 4 male supervisors, and 2 monitors (1 man, 1 woman) to oversee and administer the farmers' phone survey. IFPRI used a web-based video conferencing technology to train the survey team on

[1] The BIHS sampling was done by a consultant statistician, former Chief Statistician at the Bangladesh Bureau of Statistics, Ministry of Planning.

questionnaire content, human subjects protection, and data management remotely. The survey instrument was pre-tested to detect any potential issues with the survey questionnaire and to serve as an end-to-end rehearsal of all content and survey procedures.

Before starting the phone survey, IFPRI-PRSSP generated a list of households and corresponding mobile numbers to contact from the Feed the Future 2018/2019 endline and GFSS 2019 baseline samples. The survey enumerators called households in a random order and replaced non-responsive households after five attempts, in line with the survey protocol. When a survey enumerator successfully reached a household, the survey enumerator introduced the purpose of the survey, potential benefits for the respondent, and reviewed the consent portion of the survey questionnaire. The phone calls, on average, lasted 25 minutes, and respondents were sent Tk 100 (US$1.20) mobile phone credit after the interview in appreciation of and compensation for participating in the research.

Between August 13-September 8, 2020, IFPRI-PRSSP surveyed 2,091 farm households who are engaged in crop and non-crop agricultural activities in the Feed the Future ZOI and ZOR. Of the total sample, 1,791 farmers were surveyed from the samples of the Feed the Future ZOI and the GFSS ZOR surveys and 300 farmers were surveyed from outside the two survey samples. These additional farmers were selected using a snowball sampling strategy as follows. The survey team contacted farmers from the ZOI and ZOR survey samples, who provided telephone numbers of additional farmers with agricultural activities that had only a few observations in the population-based survey samples (e.g., flower, poultry, livestock). Moreover, the research team collected additional phone numbers of flower farmers from agricultural extension officials.

In this phone survey on different types of farmers (crop, dairy, poultry, and fish farmers), farmers were asked detailed questions on prices and availability of inputs, prices fetched from selling agricultural products, as well as the different types of market shocks that have arisen as a result of the pandemic. Importantly, the survey attempted to ascertain the month-wise trend of these issues since the pandemic started. However, asking for every month was potentially cumbersome for the respondent. Moreover, determining the recall period was a challenge when designing month-disaggregated questions. Some of the months (since the beginning of the pandemic) have specific memory markers that were easier for respondents to allude to and help with their recall. April, for example, was the month immediately after the government-announced lockdown. May, similarly, was the month of Ramadan and *Eid-al-Fitr*. July was the month after *Eid-ul-Adha*, while August was the month immediately before the survey started. In most of the month-disaggregated questions, the month of June was excluded after piloting these questions extensively. This was a compromise: the designed questions elicited enough temporal variation since the start of the pandemic, but at the same time, aimed to minimize respondent fatigue as much as possible. This is the reason why June is excluded from the results in this report.

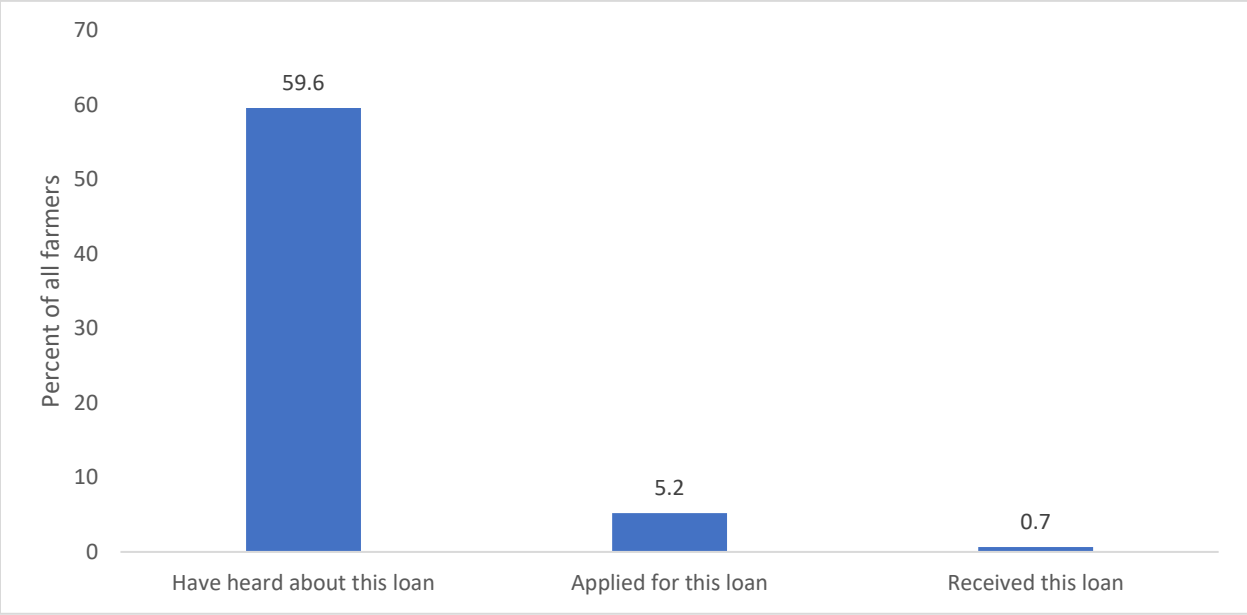
3 ACCESS TO CREDIT AND ASSISTANCE RECEIVED

In order to mitigate the adverse impacts of the COVID-19 pandemic on agriculture, the Government of Bangladesh initiated several stimulus packages including the provision of agricultural credit at a low interest rate and expanded input subsidies. This chapter reviews the changes among all sample farmers related to access to credit and assistance received from the government.

3.1 ACCESS TO CREDIT

Figure 3.1 illustrates farmers' knowledge of and response to the government-announced low-interest (4 percent annual rate) loans targeting farmers and micro, small, and medium enterprises (MSMEs). Among the 1,791 farmers from the population-based samples of the ZOI, around 60 percent heard about the government's announcement of the availability of low-interest loans for actors in the agriculture sector as well as for the MSMEs. Although there was widespread knowledge among farmers in the ZOI about this low-interest loan, very few (5 percent) applied and even fewer (less than 1 percent) received the loan.

Figure 3.1 Government-announced low-interest agriculture/MSME loans: knowledge/applied/received



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 3.2 shows why farmers did not apply for the government-announced low-interest loans. During the interview, survey enumerators did not provide reasons for farmers to choose from; rather, they self-identified any reasons applicable, which could include multiple responses. Of the 959 famers in the ZOI

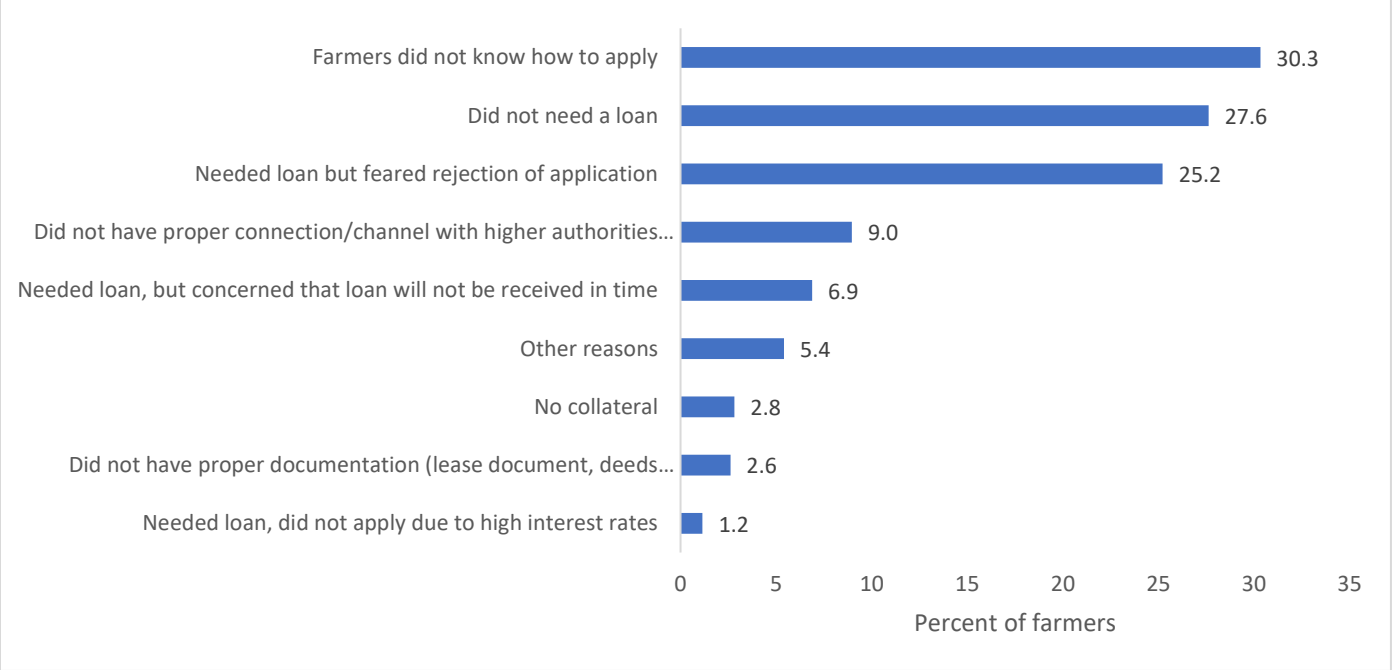
who knew about the loans but did not apply, over one-quarter (27.6 percent) did not need a loan. Alarmingly, nearly one-third (30.3 percent) did not know how to apply.

Although there were no loan application fees, one-quarter (25.2 percent) of the farmers were dissuaded from applying out of fear of being rejected and anticipated transaction costs. This is understandable given the lack of access to credit among smallholder farmers in Bangladesh. IFPRI-PRSSP's 2018/2019 Feed the Future ZOI endline survey data show that only 7.5 percent of smallholder famers in the ZOI received any loans from Krishi (agricultural) Bank, whereas 13.1 percent of large farmers received a loan from Krishi Bank.

Various sources have identified lack of documentation (e.g., well-defined property rights) and collateral as key constraints to farmers' access to loans from formal sources (Akter and Haque 2017; Khandker, Samad, and Ali 2013); however, IFPRI's farmers' phone survey results do not explicitly find these to be key barriers to farmers' access to the government announced low-interest bank loans for farmers and MSMEs.

A relatively small proportion of those who did not apply for the government-announced loans indicate that insufficient documentation (2.6 percent) and inadequate collateral (2.6 percent) as the reasons for not applying. On the other hand, it is possible that these particular constraints of documentation and collateral have been subsumed within the response: "needed loan but did not apply for a loan out of fear of being rejected."

Figure 3.2 Reasons why farmers, who were aware about the government-announced, low-interest loans for agriculture/MSME, did not apply for these loans



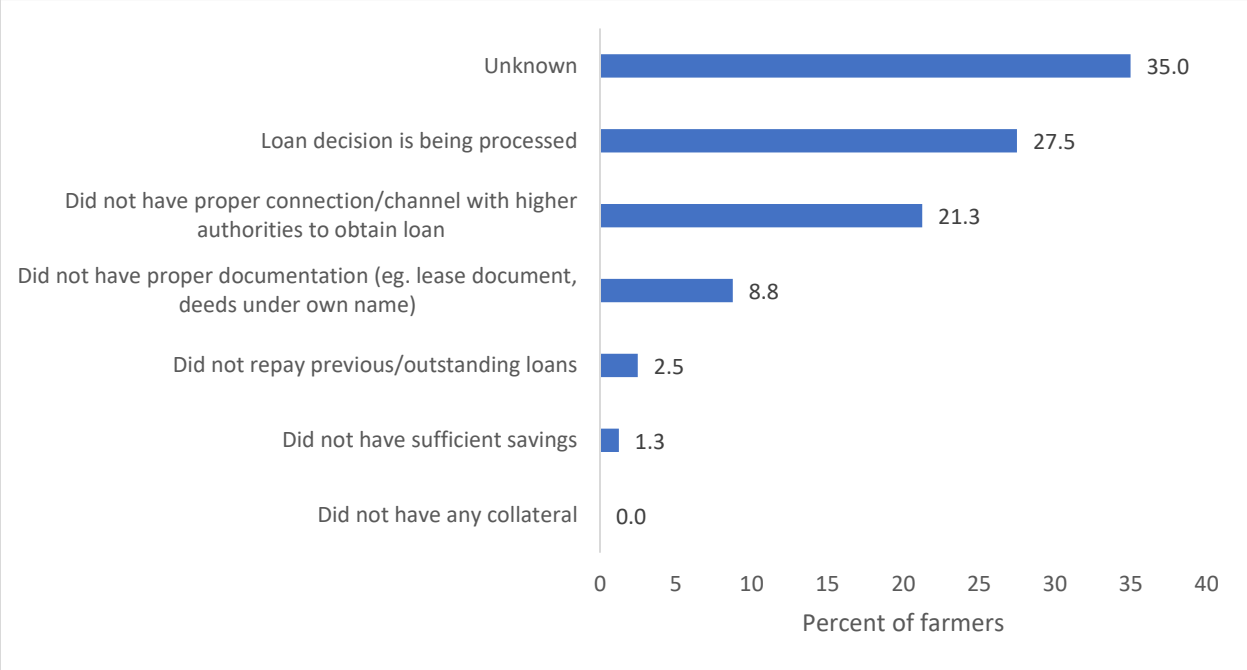
Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 3.3 shows the reasons why farmers did not receive the low-interest agriculture/MSME loan despite applying for it. Among the 80 ZOI farmers who applied but did not receive the government-announced loan, 35 percent of them did not know why their loan applications were rejected. Of note, 21.3 percent perceived their lack of connections to higher-level authorities to be decisive in their rejection. A recent study by Caritas Rajshahi found that many needy farmers who applied for agricultural loans amid COVID-19 were rejected, whereas local politicians and officials were approved for these loans (Uttom 2020).

Despite various sources identifying collateral as a key reason undermining farmers' access to loans amid COVID-19, no surveyed farmers raised this as a reason for being rejected from receiving a low-interest loan.

Slightly over one-quarter (27.5 percent) indicate that their loan applications are pending.

Figure 3.3 Farmers' perceived reasons why their government-announced low-interest agricultural/MSME loan application was rejected

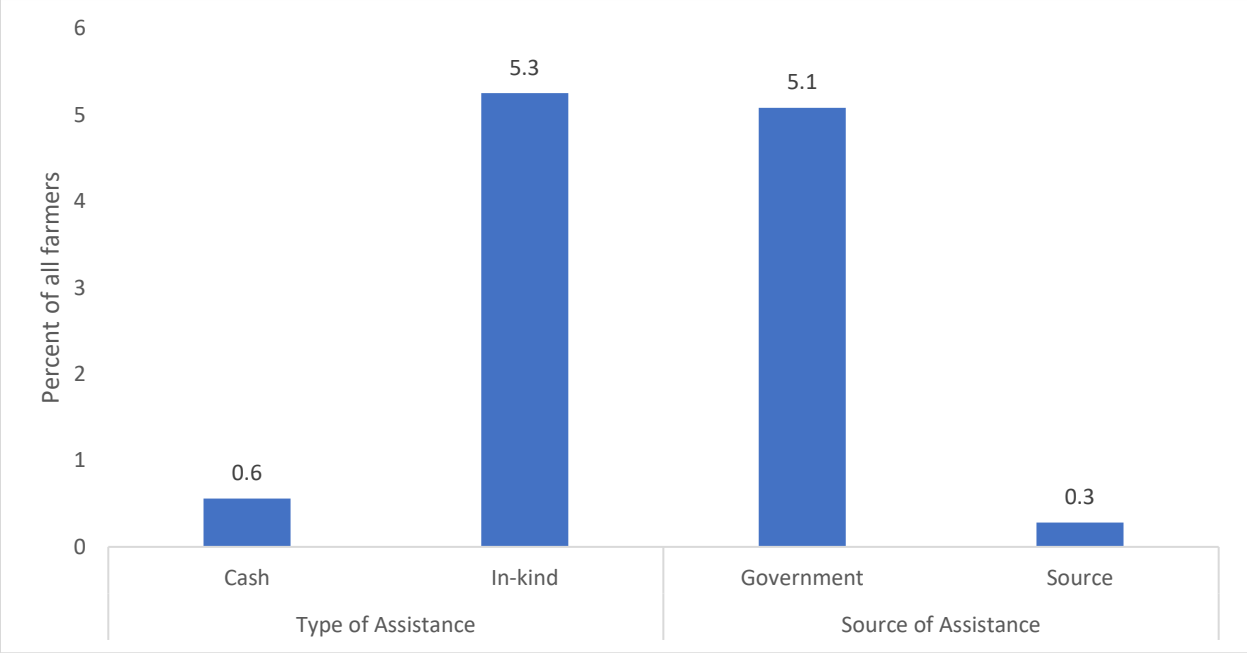


Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

3.2 ASSISTANCE RECEIVED

Figure 3.4 shows the percentage of ZOI farmers who received agriculture-related assistance in the five months following the outbreak. Overall, very few (5.4 percent) ZOI farmers received any agriculture-related assistance, either in the form of cash or in-kind (e.g., fertilizer, seed, etc.). Farmers who received assistance predominantly from the government (5.2 percent) and related to the provision of agricultural inputs (5.3 percent). In contrast, NGOs provided negligible cash or in-kind assistance towards ZOI farmers (0.3 percent).

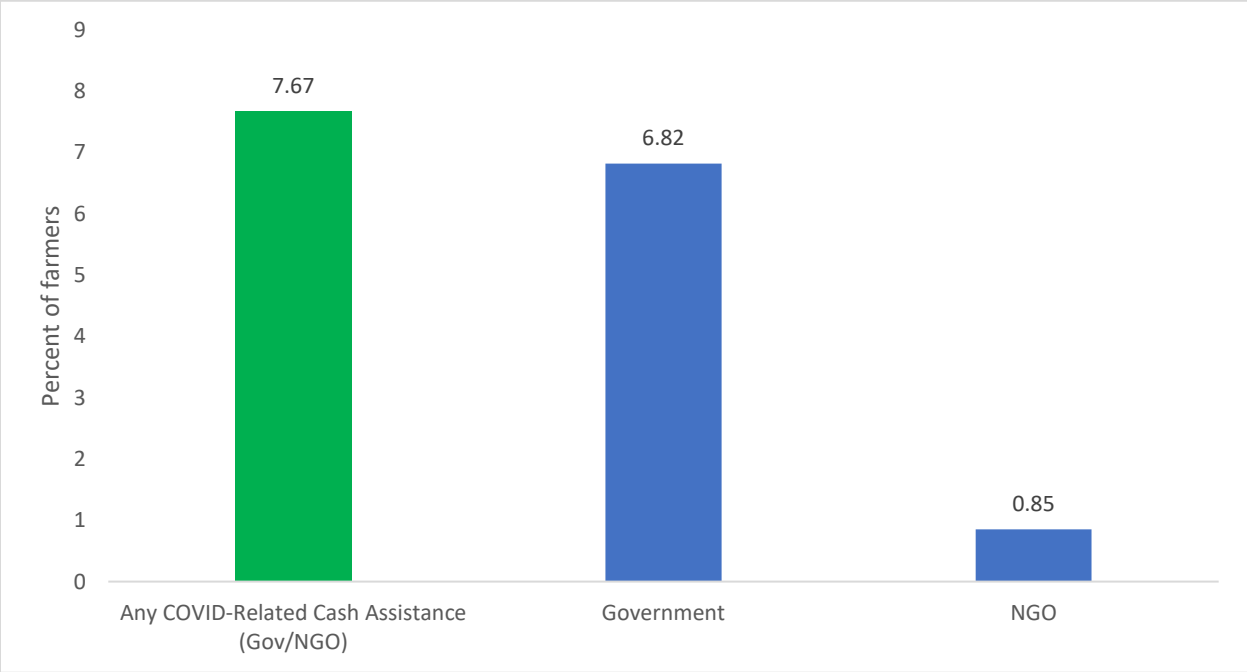
Figure 3.4 Farmers who received agriculture-related assistance (April-June 2020)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 3.5 shows the proportion of ZOI farmers who received COVID-19-related cash assistance between April-June 2020, either from government or NGOs. More farmers received any COVID-19-related cash assistance (7.7 percent) than agriculture-related assistance (5.4 percent). Almost all of the COVID-19 cash assistance received by ZOI farmers was from the government; in contrast, NGOs provided nominal cash support to farmers during the reference period (6.8 percent and 0.9 percent, respectively).

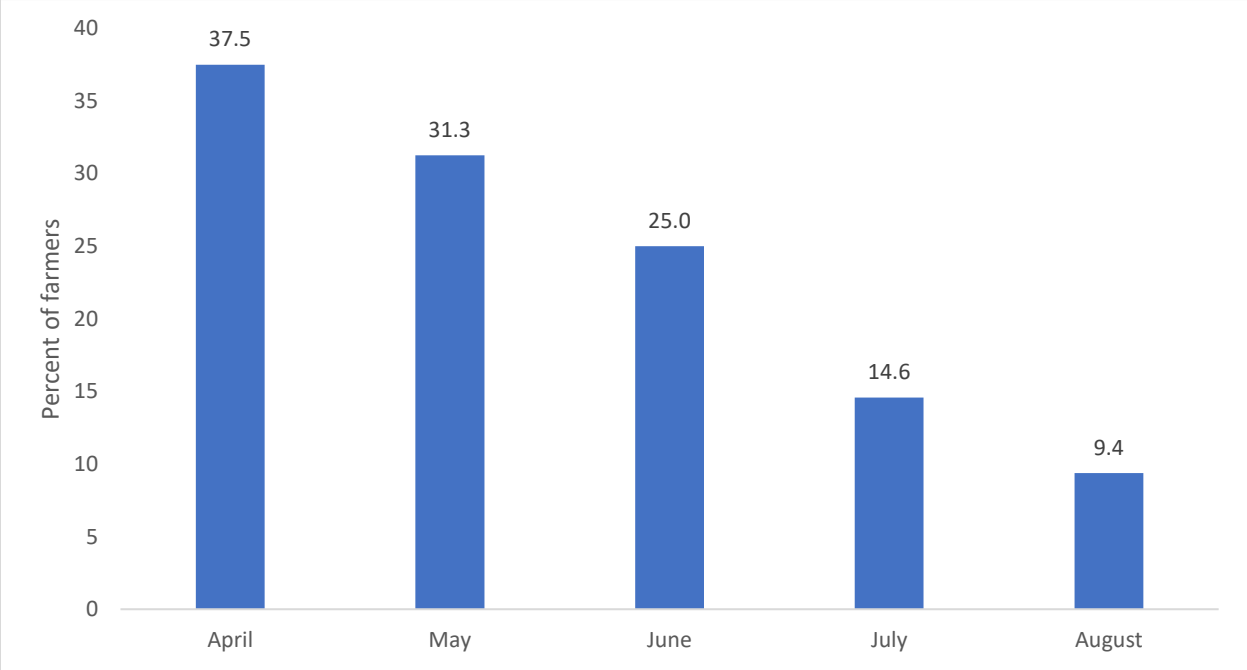
Figure 3.5 COVID-19-related cash assistance from government or NGOs



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 3.6 shows which month ZOI farmers received agriculture-related assistance between April and August 2020. Among the 5.4 percent of the farmers in the ZOI sample who received agriculture-related assistance, most received this type of assistance in April (37.5 percent), which is when the government announced the Tk 500 billion stimulus package. Afterwards, this type of support gradually declined. Six months after the pandemic began in Bangladesh, only 9.4 percent of those who received any agriculture-related assistance reported to have received such assistance in August.

Figure 3.6 Month that farmers received agriculture-related assistance, April-August 2020



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

4 RICE FARMING

4.1 BORO RICE

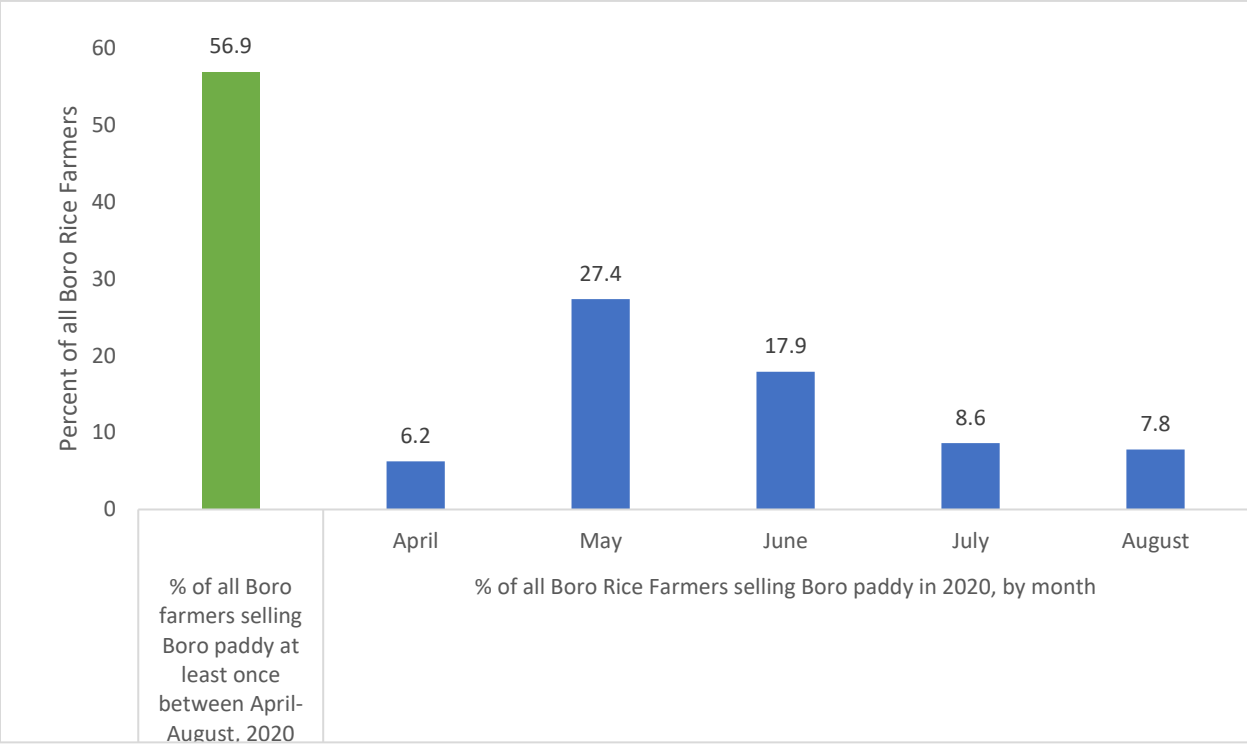
Boro is the dry season irrigated rice crop planted from December to early February and harvested between April and June. Boro rice is the predominant rice crop cultivated in Bangladesh: in 2018/2019, boro accounted for 53.8 percent of the total rice production of 36.4 million metric tons (MT).

The Government of Bangladesh (GoB) announced policy measures to mitigate the effects of COVID-19 on boro rice farmers. For instance, on April 12, 2020, the GoB announced its plans to increase boro paddy procurement from farmers by 100 percent compared with the 2019 boro season, for a target amount of 800,000 MT of paddy between April and August 2020. However, only 25 percent of target was achieved until August 2020. The GoB also halved irrigation charges for the pumps owned by Bangladesh Agricultural Development Corporation (BADC).

This section describes the production and marketing experiences of boro rice farmers in the Bangladesh ZOI between April and August 2020. In the phone survey, 961 boro farmers drawn from the population-based samples of the Feed the Future and GFSS baseline samples were interviewed.

Figure 4.1 shows the percentage of farmers who sold boro paddy by month in 2020. About 57 percent of the sample ZOI farmers who produced boro paddy sold them between April and August 2020. As expected, very few farmers (6.2 percent) sold boro paddy in April, which is very early in the harvest season. Over one-quarter (27.4 percent) sold boro paddy in May.

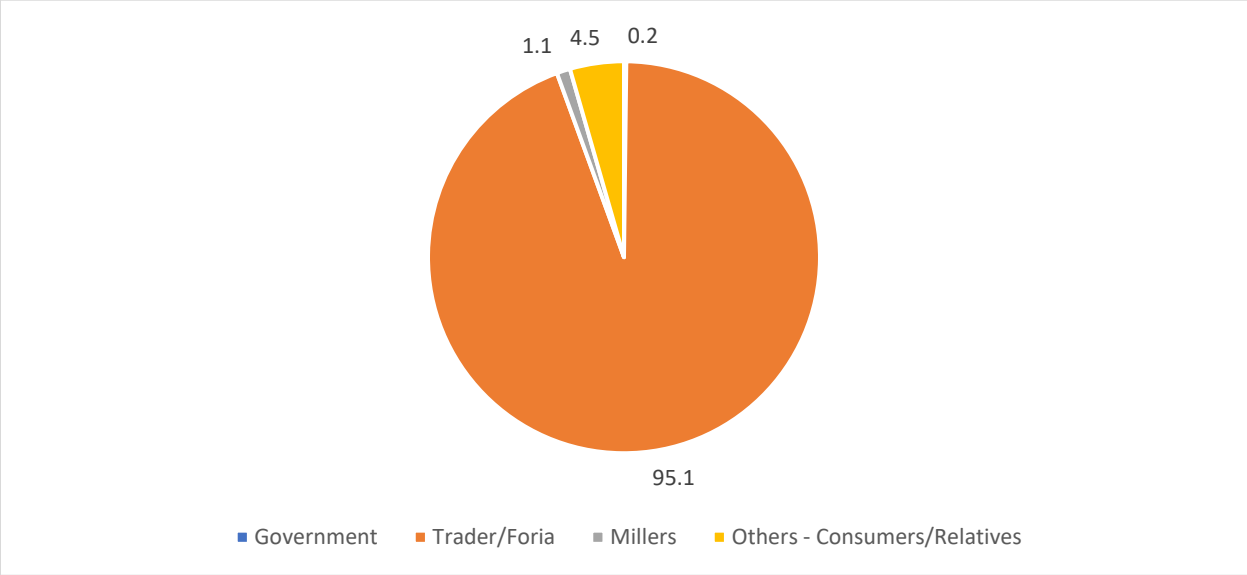
Figure 4.1 Percentage of farmers who sold boro paddy (April-August 2020)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 4.2 shows to whom ZOI farmers sold their boro paddy in 2020. Virtually all (95.1 percent) farmers sold boro paddy to traders or *foria*, whereas a marginal percentage of ZOI farmers sold to consumers and relatives (4.5 percent) and rice millers (1.1 percent). Only 0.2 percent of farmers sold boro paddy to GoB.

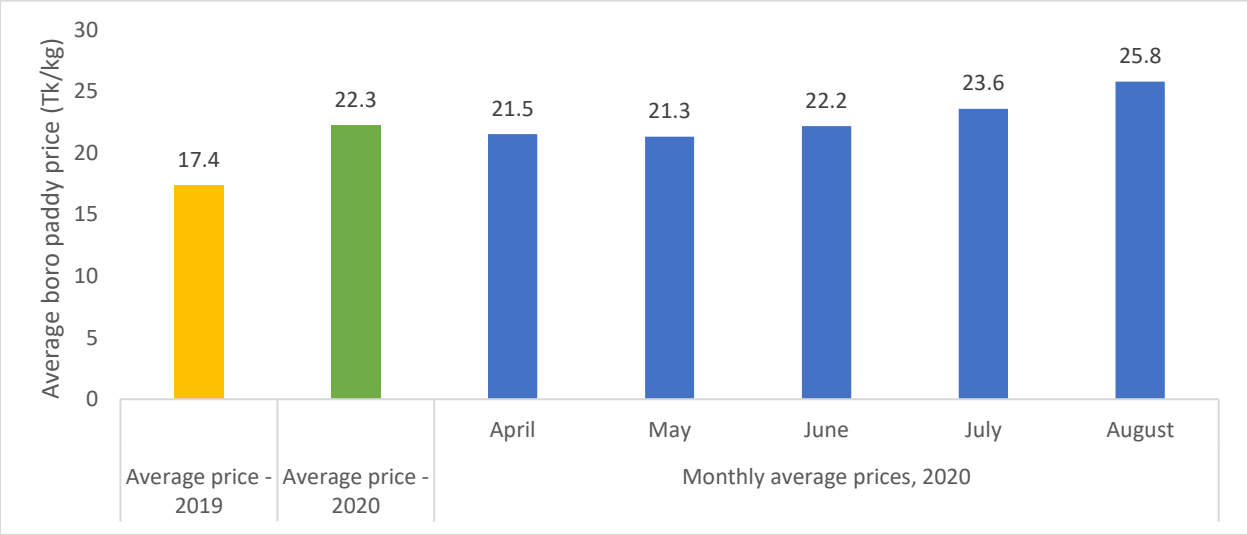
Figure 4.2 Boro farmers' main buyers of boro paddy in 2020



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 4.3 shows the average monthly boro paddy prices received by farmers between April and August 2020, as well as the average prices received in 2019 and 2020. Boro paddy sales prices incrementally increased from April to August 2020, ranging from Tk 21.5/kg in April 2020 to Tk 25.80/kg in August 2020. The average sales price of boro paddy in 2020 is Tk 22.3/kg. This is significantly higher than the average paddy price received in the 2019 boro harvest season, which was Tk 17.4/kg. Despite boro paddy prices being relatively lower during the initial months after the outbreak, most farmers sold boro paddy during this time compared with July or August—when prices were relatively higher. A recent IFPRI-PRSSP study finds that the main reason for selling paddy soon after harvest is the financial pressure farmers face to pay back loans (Ahmed, Bakhtiar, and Rahman 2020).

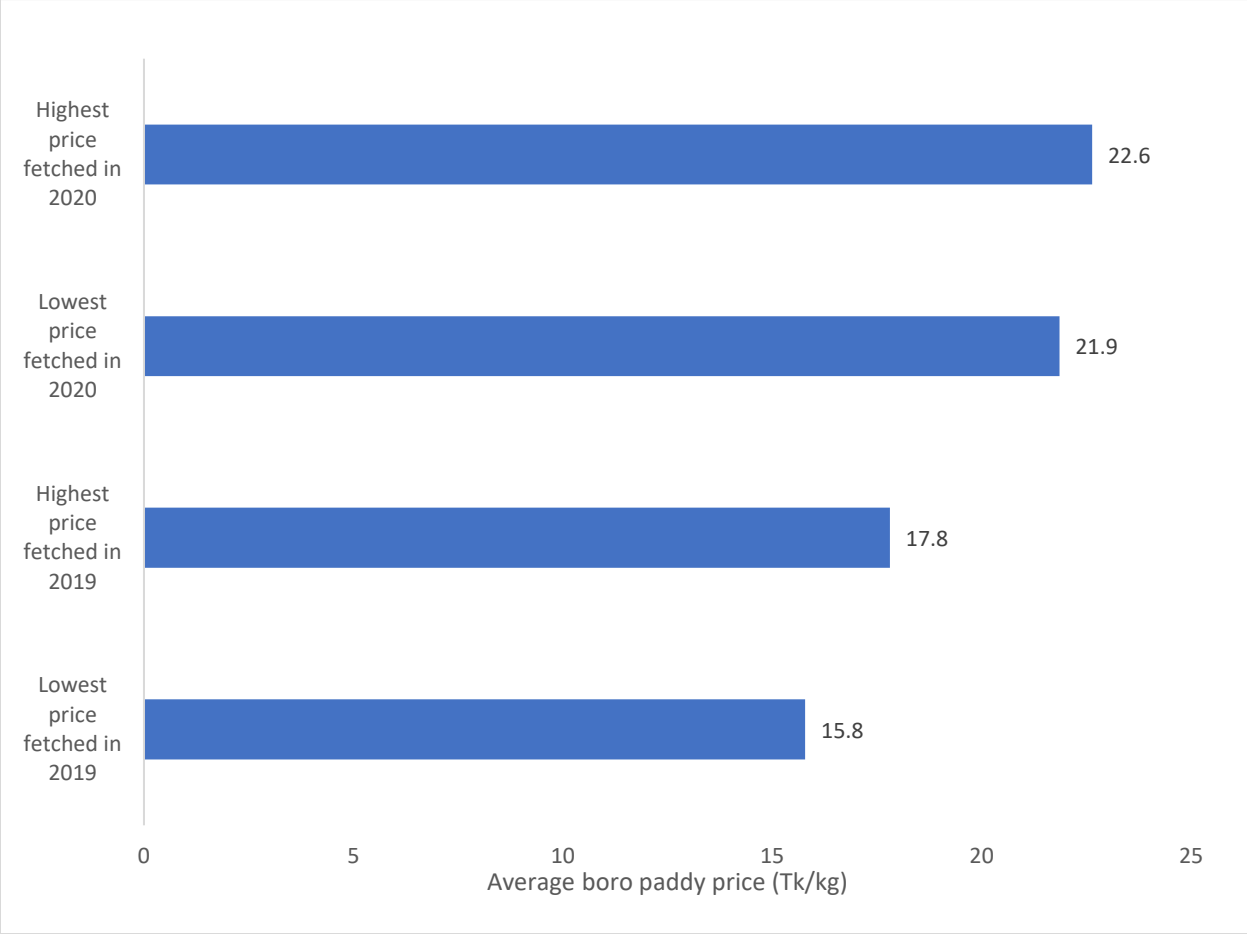
Figure 4.3 Monthly average boro paddy price received by farmers (April-August 2020)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 4.4 compares boro paddy prices between 2019 and 2020. Paddy prices received by farmers last year were much below the announced paddy procurement price of Tk 26/kg in 2019, as well as the prices received this year. Please note that the numbers in **Figure 4.4** are the 'average' of all the highest and lowest prices reported by farmers. This is important to capture since a significant portion of farmers sell multiple times.

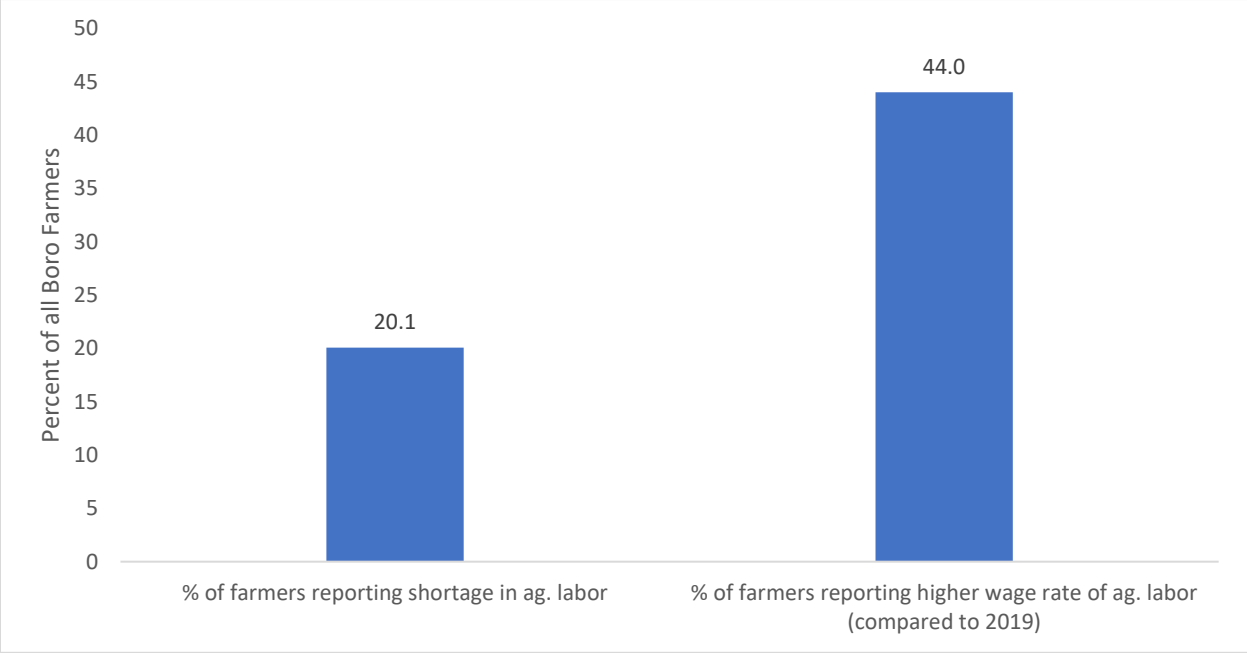
Figure 4.4 Average highest and lowest boro paddy prices received by all selling boro farmers, comparing 2019 and 2020



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 4.5 shows the market shortages of laborers in the agricultural labor market reported by boro rice farmers. Overall, 20.1 percent of ZOI farmers faced a labor market shortage, most likely due to COVID-19-related disruptions. A decrease in the supply of agricultural labor increased agricultural labor wages. On average, 44 percent of the sample farmers reported higher agricultural labor wages in 2020 compared with 2019.

Figure 4.5 market shortages and higher prices of agricultural laborer in April-August as reported by boro farmers



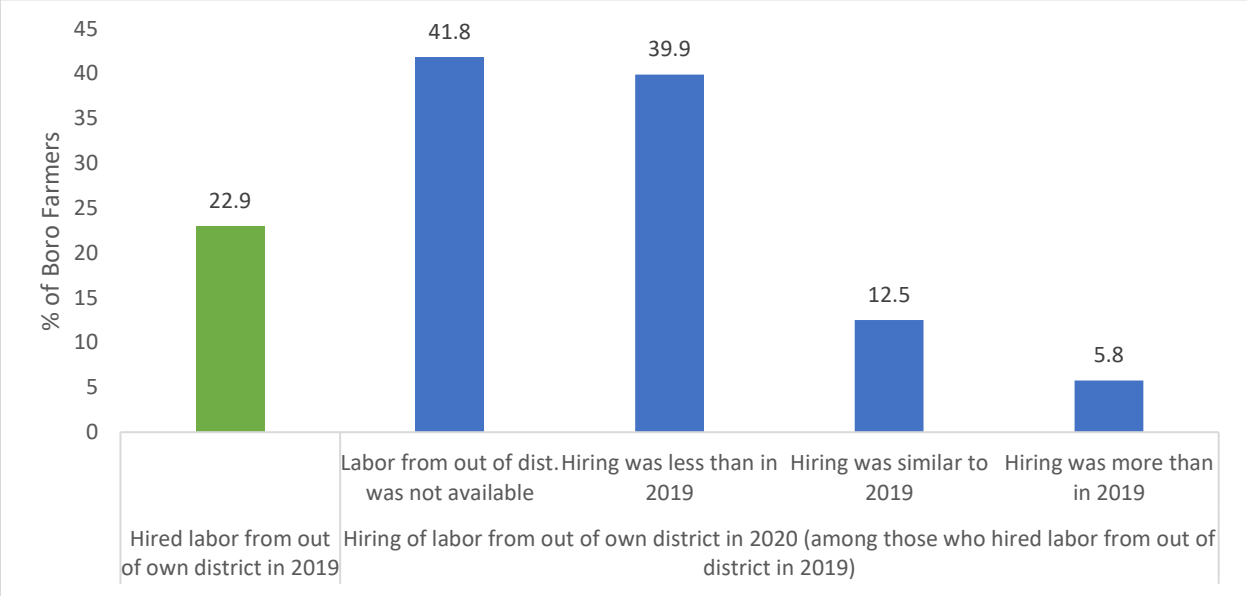
Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Feed the Future ZOI farm households often hire agricultural laborers from other districts during rice sowing and harvesting seasons due to labor scarcity within the district (Etzold, Ahmed, Hassan, and Neelormi 2014).

Figure 4.6 shows that, among the 961 surveyed boro rice farmers, nearly one-quarter (23 percent) hired laborers from another district in 2019. Among these farmers who hired out-of-district labor last year, 41.8 percent reported that agricultural labor from other districts was unavailable this year and 39.8 percent of these farmers hired less labor than last year. These changes in agricultural labor are likely due to restricted movement, which made it more challenging to hire out-of-district labor.

There is a relatively smaller percentage of farmers who maintained the same out-of-district agricultural labor force as last year (12.6 percent) or increased it (5.8 percent).

Figure 4.6 Agricultural Labor Mobility



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

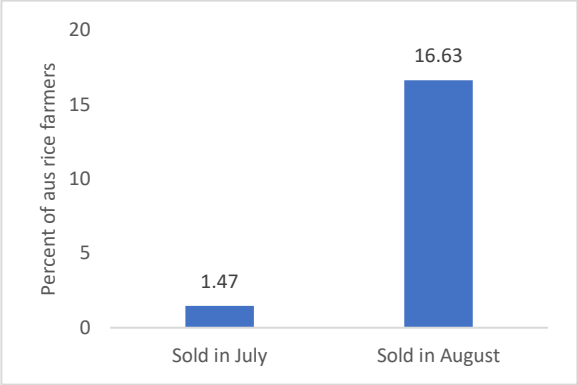
4.2 AUS RICE

Aus is the rain-fed summer rice crop, which is planted between March and April and harvested in June and July (Rahman et al. 2016). Aus represented 7.6 percent of the 2018/2019 total rice production of Bangladesh—the least of the three main rice crops—aman, aus, and boro (Ahmed, Bakhtiar, and Rahman 2020).

In April 2020, the Ministry of Agriculture announced a Tk 9 crore (US$1.1 million) incentive to provide seed and fertilizer to small and marginal farmers to encourage cultivation during the aus rice season (Roy and Parvez 2020).

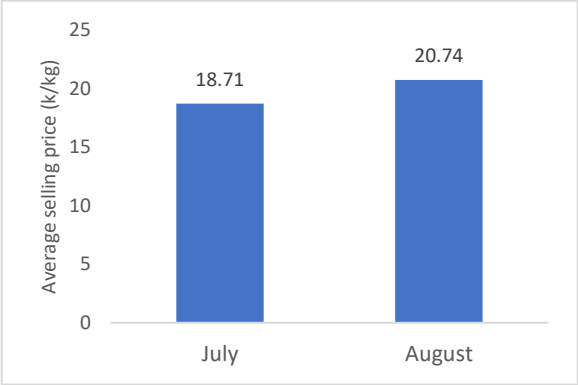
Figure 4.7 presents the proportion of farmers who sold aus rice in 2020. Nearly one-fifth (18.1 percent) of aus farmers sold any aus paddy in 2020, most of which was done in August (16.6 percent). This aligns with the period after the aus harvest. Between July and August 2020, the average selling price of aus paddy increased marginally, from Tk 18.71/kg to Tk 20.74/kg (**Figure 4.8**). Farmers who sold their aus crop later fetched a slightly higher price.

Figure 4.7 Percentage of farmers who sold aus rice in 2020 (among those who sold)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 4.8 Average monthly selling price, aus rice (July-August 2020)

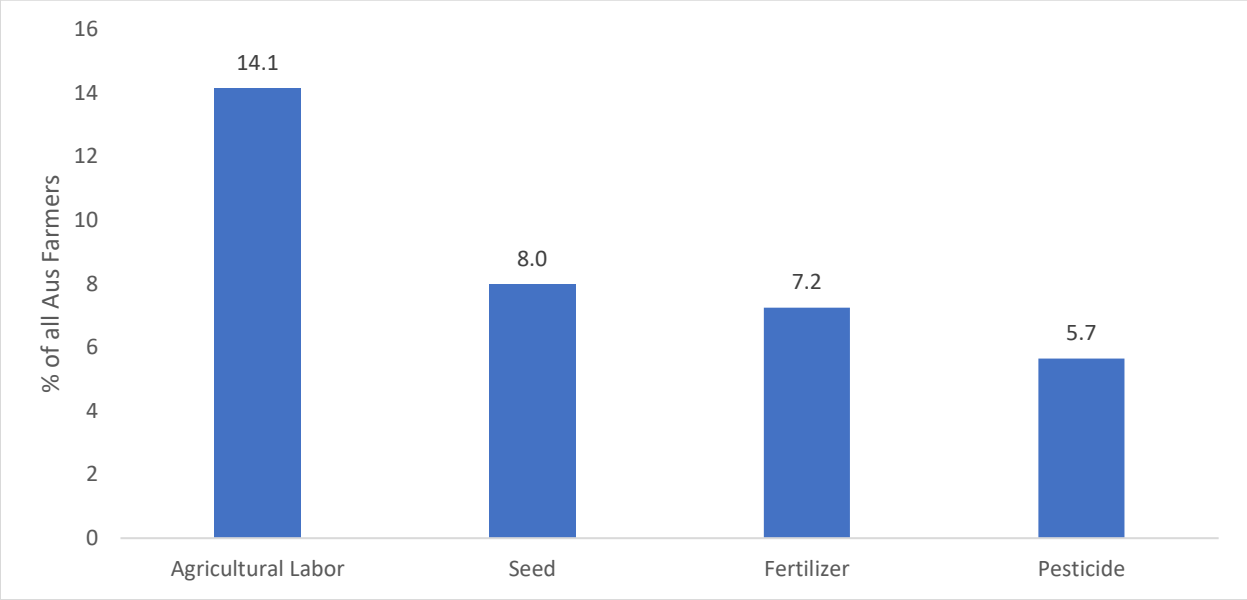


Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 4.9 illustrates market shortages laborers in agricultural labor market reported by aus rice farmers in the ZOI. Between April and August 2020, 14.1 percent of aus rice farmers reported market shortages in agricultural laborers, most likely caused by the COVID-19-related movement restrictions.

Figure 4.9 also shows that 8 percent of aus rice farmers reported a seed market shortage in the market, while 7.2 percent and 5.7 percent of aus farmers report market shortages in fertilizers and pesticides, respectively.

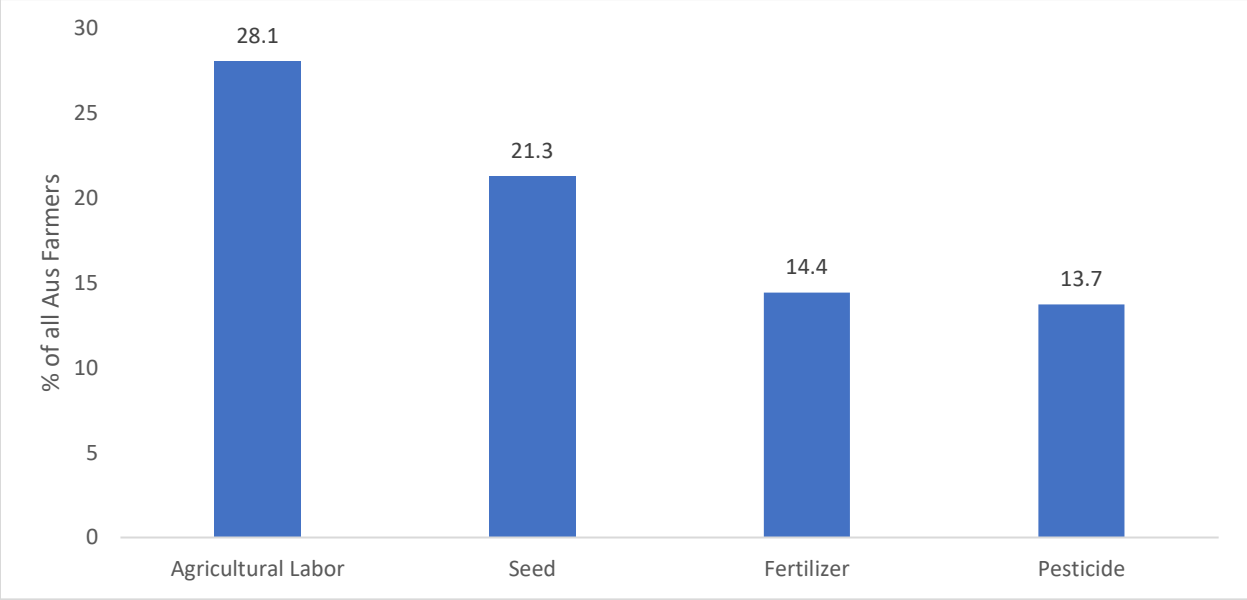
Figure 4.9 Percent of aus rice farmers who reported market shortage in agricultural labor and agricultural input – seed, fertilizer and pesticide – at least in one month during April-August 2020



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

A decrease in the supply of agricultural labor increased agricultural labor wages (**Figure 4.10**). On average, 28.1 percent of the sample farmers reported higher agricultural labor wages in 2020 compared with 2019. Moreover, 21.3 percent of aus rice farmers found seed prices higher in 2020 than in 2019. On the other hand, 14.4 percent and 13.7 percent of aus farmers report higher prices for fertilizers and pesticide in the April-August period.

Figure 4.10 Percent of aus rice farmers who reported a higher price of agricultural labor and agricultural input – seed, fertilizer and pesticide – at least in one month during April-August, 2020



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

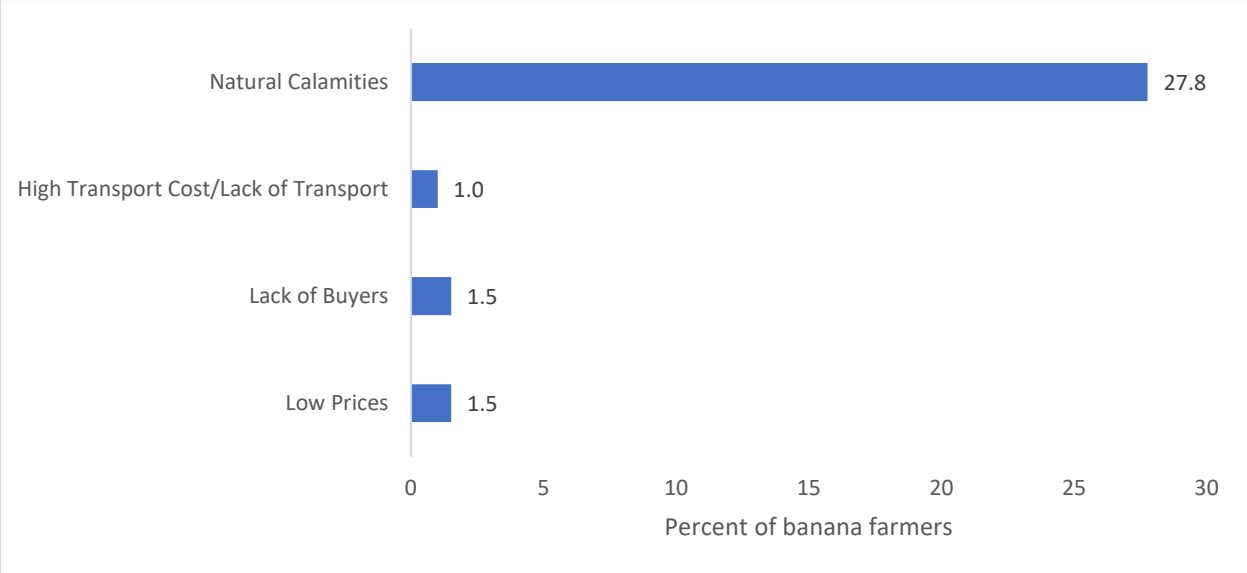
5 FARMING OF NON-RICE CROPS

5.1 BANANA

Banana is the most important fruit in Bangladesh, constituting over 40 percent of total fruit production in 2018 (BBS 2019). It is grown all year and all over the country. IFPRI interviewed 198 banana farmers in the Feed the Future ZOI.

Figure 5.1 shows that banana farmers mainly could not sell for at least one month between April and August 2020 due to natural calamities (27.8 percent). A relatively nominal proportion of banana farmers attributed their inability to sell their crops for at least one month due to transport (1.0 percent), lack of buyers (1.5 percent), or low prices (1.5 percent).

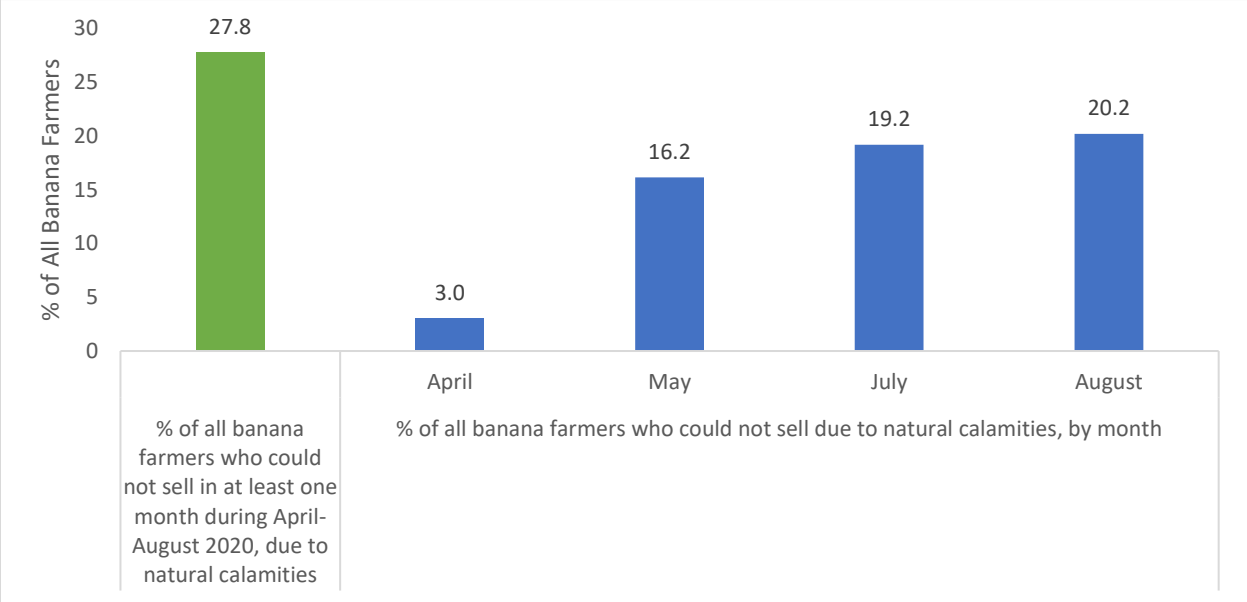
Figure 5.1 Percent of banana farmers (i.e., who sold at least once this year) who were not able to sell at least during one month between April-August 2020 due to COVID-related issues



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

As reported earlier, over one-quarter (27.8 percent) of banana farmers reported that they could not sell for at least one month between April and August 2020 due to natural calamities (**Figure 5.2**). The proportion of banana farmers who reported this as an issue increased five-fold between April and May 2020, from 3.0 percent in April to 16.2 percent in May 2020. This proportion further increased in the following months, reaching 20.2 percent in August 2020.

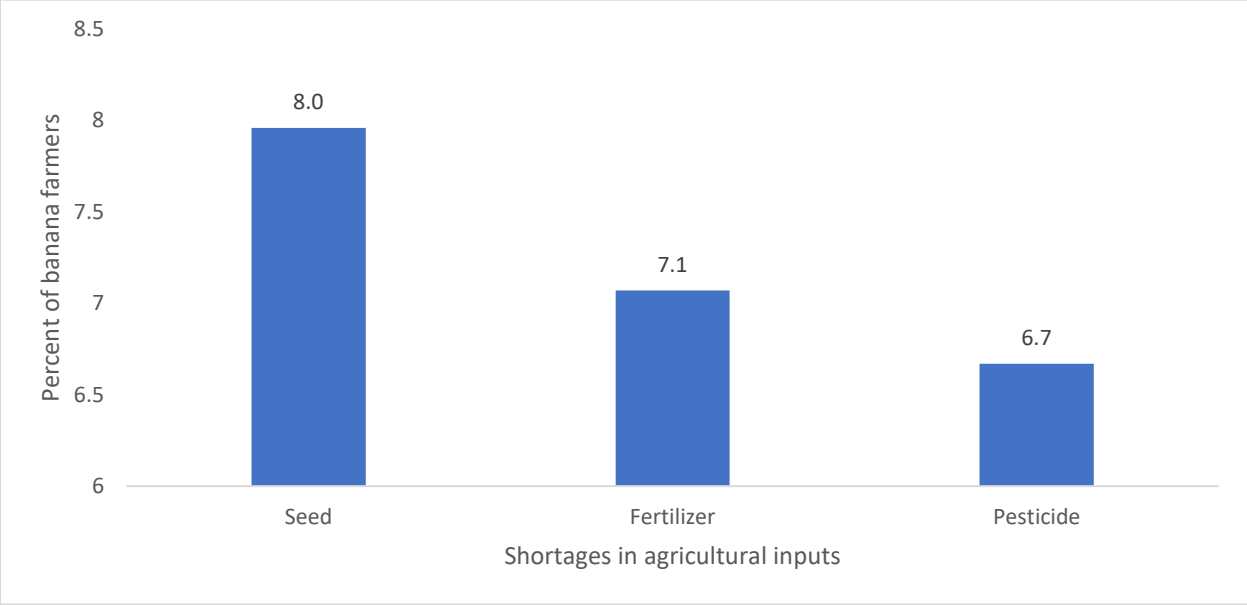
Figure 5.2 Percentage of banana farmers who were unable to sell due to natural calamities (April-August)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 5.3 depicts the proportion of banana farmers who faced market shortages in select agricultural inputs. 8 percent of banana farmers faced market shortages in seedling, 7 percent in fertilizer, and 7 percent in pesticide during the April-August 2020 reference period.

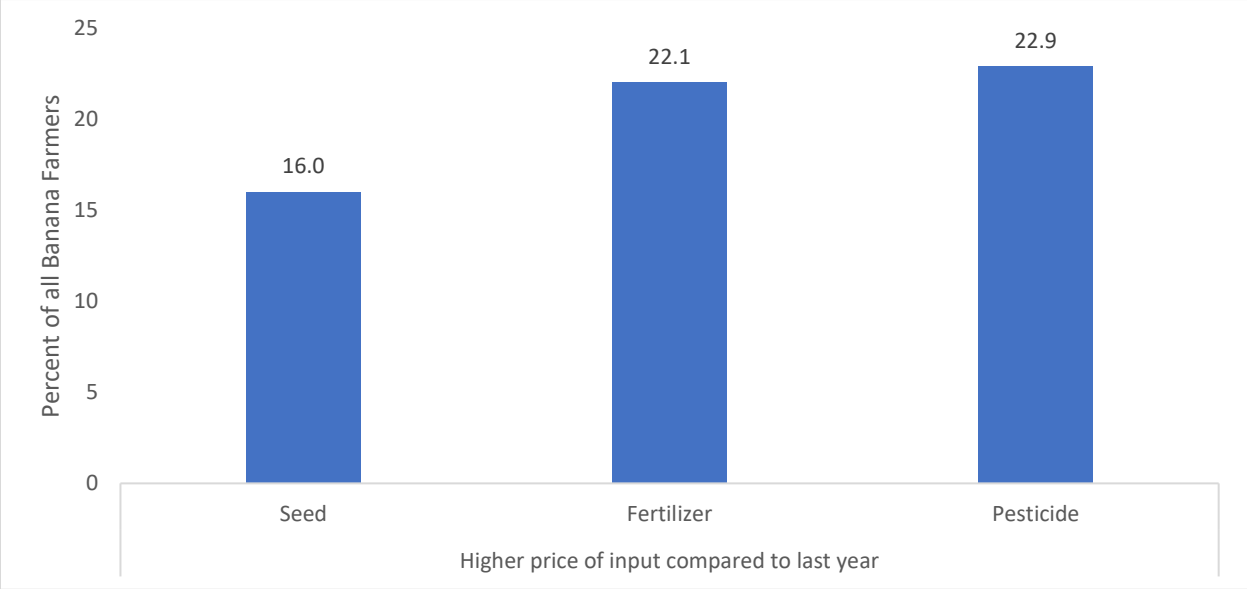
Figure 5.3 Percent of banana farmers who faced market shortages in agricultural inputs at least in one month in April-August 2020



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 5.4 shows the proportion of banana farmers who reported higher prices in agricultural inputs (such as seed, fertilizer and pesticide) this year compared with last year. The magnitude is roughly similar across the different inputs: 16 percent reported higher seed price, 22 percent higher fertilizer price, and 23 percent higher pesticide price at least in one month during the April-August 2020 period compared with the same timeframe in 2019.

Figure 5.4 Percent of banana farmers who faced higher price in agricultural inputs (compared to last year) at least in one month in April-August 2020



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

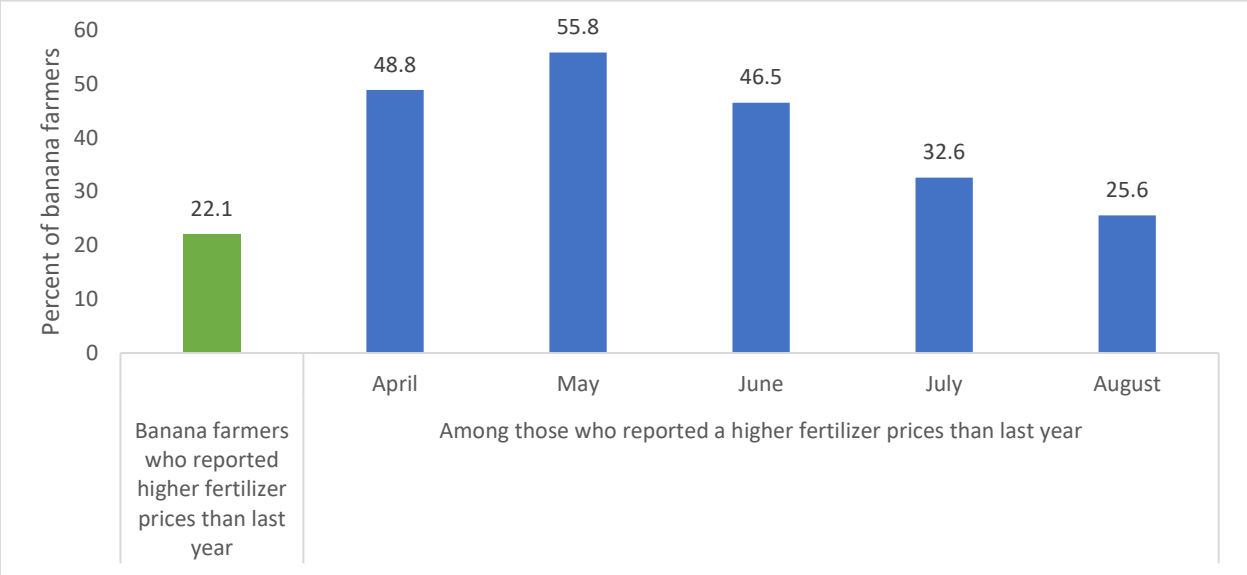
Figure 5.5 provides a profile of farmers who reported increased seedling prices compared with last year, by month. Among the 16.0 percent of surveyed banana farmers, over three-quarters (79.3 percent) reported higher seed prices in April 2020 versus April 2019. The proportion of banana farmers who reported higher seed prices gradually decline to 55.2 percent in May and 24.1 percent in June. By July 2020, seed prices appear to have recovered, with only 3.5 percent of banana farmers still reporting higher seed prices in July and August 2020 compared with the same time last year.

Figure 5.5 Percent of banana farmers who reported higher seed prices than last year, by month

Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 5.6 shows which months banana farmers report higher fertilizer prices than 2019 among those who reported higher fertilizer prices. There is a slightly higher proportion of banana farmers in the ZOI who report higher fertilizer prices than seed (22.1 percent compared to 16.0 percent). The findings also show that a higher proportion of banana farmers reported higher fertilizer prices in April (49 percent), May (56 percent), and June (47 percent). Over time, the percentage of farmers reporting higher fertilizer prices compared with last year dropped to 33 percent in July and 26 percent in August 2020. Although the percentage of banana farmers who reported higher fertilizer prices decreased over time, about one-quarter (26 percent) of banana farmers still experienced higher fertilizer prices in six months after the onset of the pandemic.

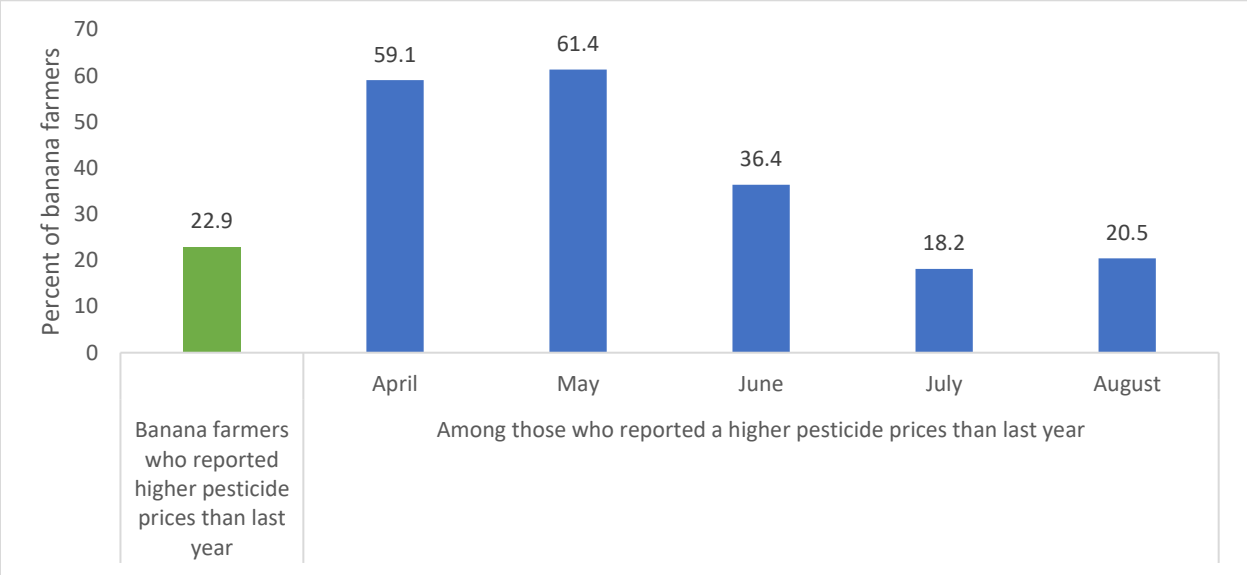
Figure 5.6 Percent of banana farmers who reported higher fertilizer prices than last year, by month



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 5.7 shows the percent of banana farmers who reported higher pesticide prices than last year between April and August 2020. Among the 22.9 percent of banana farmers who reported higher pesticide prices during this five-month period, higher fertilizer prices were reported mostly in the earlier months of the pandemic (among 59.1 percent in April and 61.4 percent in May). Although the percentage of banana farmers who reported higher pesticide prices dropped substantially between May and June (from 61 percent to 36 percent), it is notable that one-fifth (20.5 percent) of banana farmers still reported higher fertilizer prices compared with last year in August 2020.

Figure 5.7 Percent of banana farmers who reported higher pesticide prices than last year, by month



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

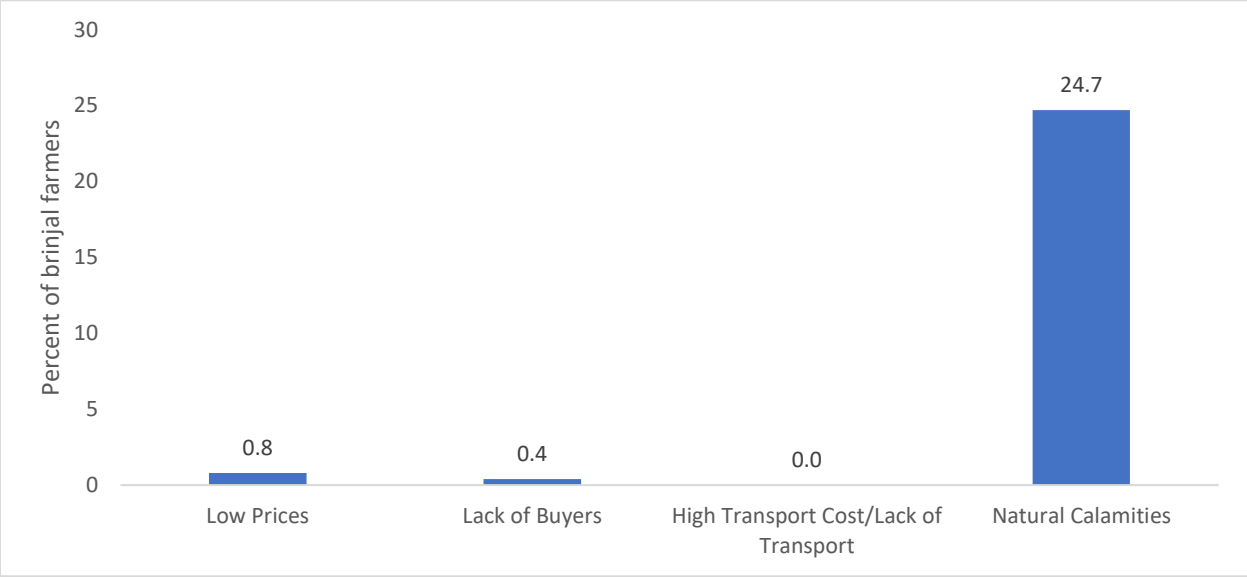
5.2 BRINJAL

Brinjal is a popular winter and summer crop in Bangladesh. It is typically sown in mid-August to September for winter varieties, and mid-February to March for summer varieties (Chowdhury and Hassan 2013). Brinjal ranks third after potato and rice among crops in the country in terms of quantity consumed (Ahmed, Hoddinott, Tanger, and Perlman 2019).

In the Feed the Future ZOI, 251 brinjal farmers were surveyed to assess the effects of COVID-19 on supply chain disruptions.

Figure 5.8 shows the proportion of brinjal farmers who could not sell brinjal for at least one month between April and August 2020, by reason. Nearly one-quarter (24.7 percent) of brinjal farmers in the ZOI could not sell for at least one month due to natural calamities. On average, transport, lack of buyers, and low prices did not present challenges to brinjal farmers during the reference period.

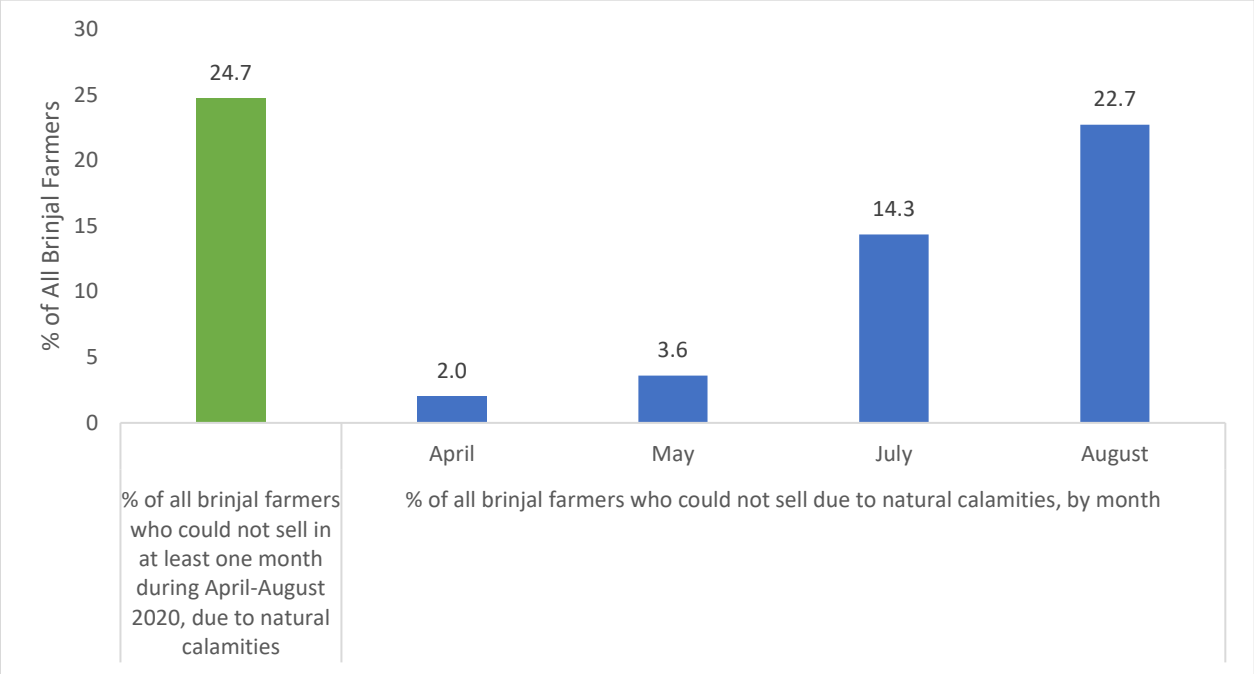
Figure 5.8 Percent of brinjal farmers (i.e., who sold at least once this year) who were not able to sell at least during one month between April-August 2020 due to COVID-related issues



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 5.9 shows the percentage of brinjal farmers who were affected by natural calamities by month. The highest proportion of hard-hit farmers was in August 2020 (22.7 percent), which aligns with the incidence of heavy rainfall and monsoon floods.

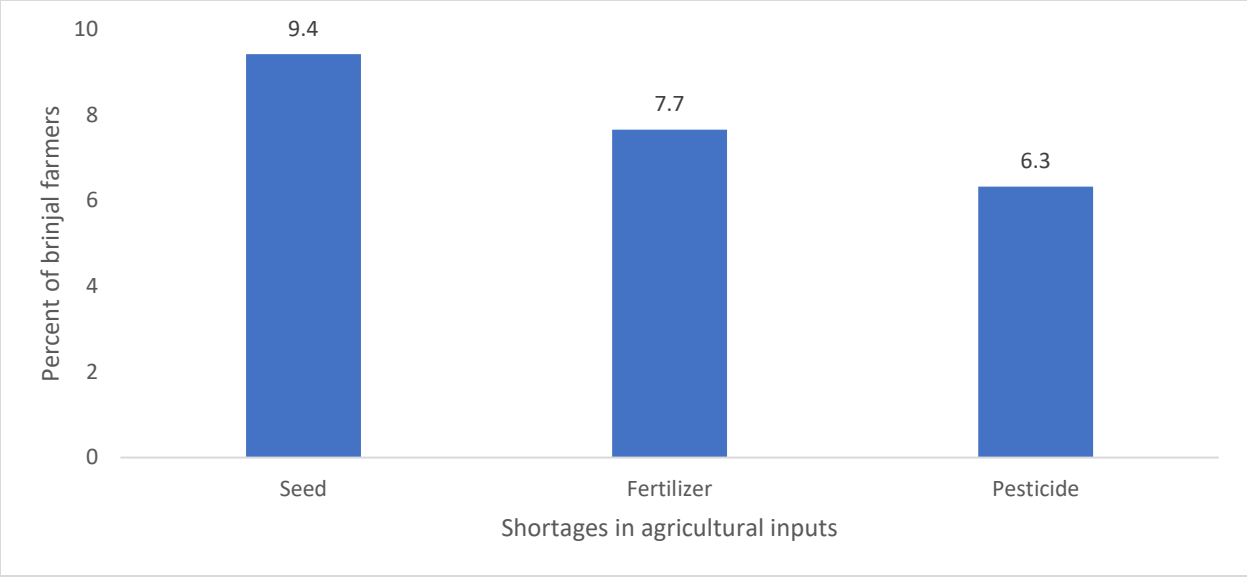
Figure 5.9 Percentage of brinjal farmers who were unable to sell due to natural calamities (April-August 2020)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 5.10 reflects the market shortages in agricultural inputs faced by brinjal farmers between April and August 2020. Similar with other crops, the highest proportion of farmers faced market shortages in seed (9.4 percent), followed by fertilizer (7.7 percent), and then pesticide (6.3 percent).

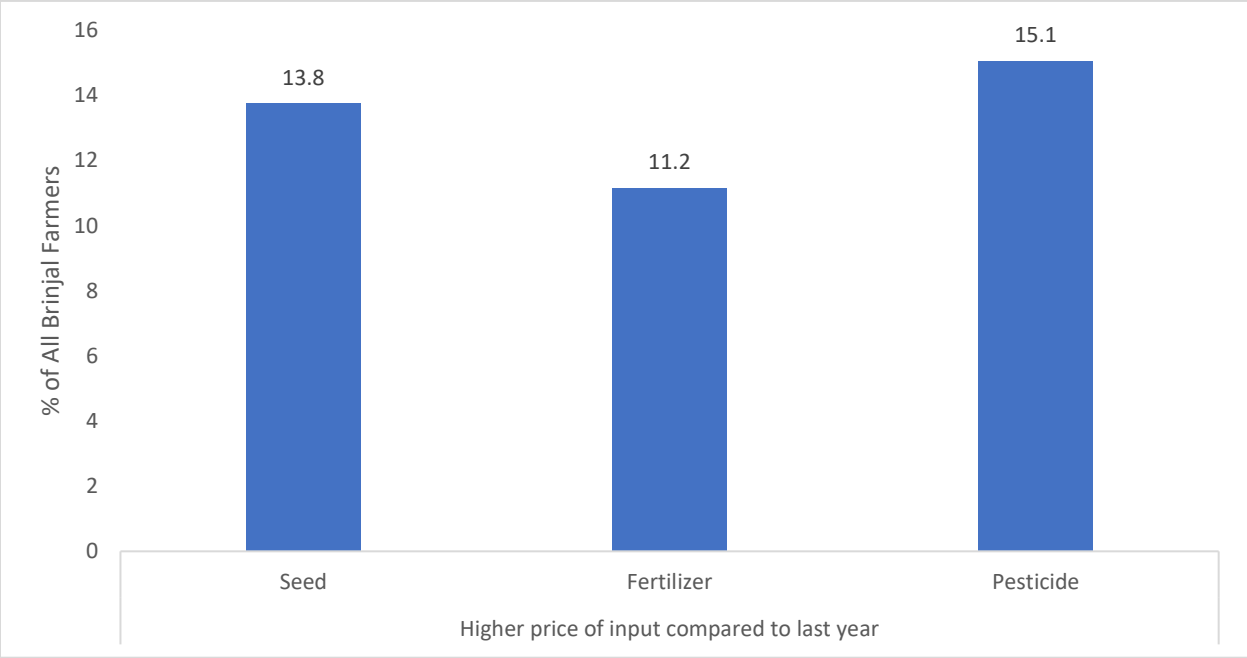
Figure 5.10 Percent of brinjal farmers who faced market shortages in agricultural inputs (April-August 2020)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 5.11 reflects the fraction of brinjal farmers who reported to have faced higher prices in agricultural inputs faced between April and August 2020. The proportion of farmers facing higher prices in seed this year is 13.8 percent; for fertilizers and pesticides, the corresponding numbers are 11.2 percent and 15.1 percent, respectively.

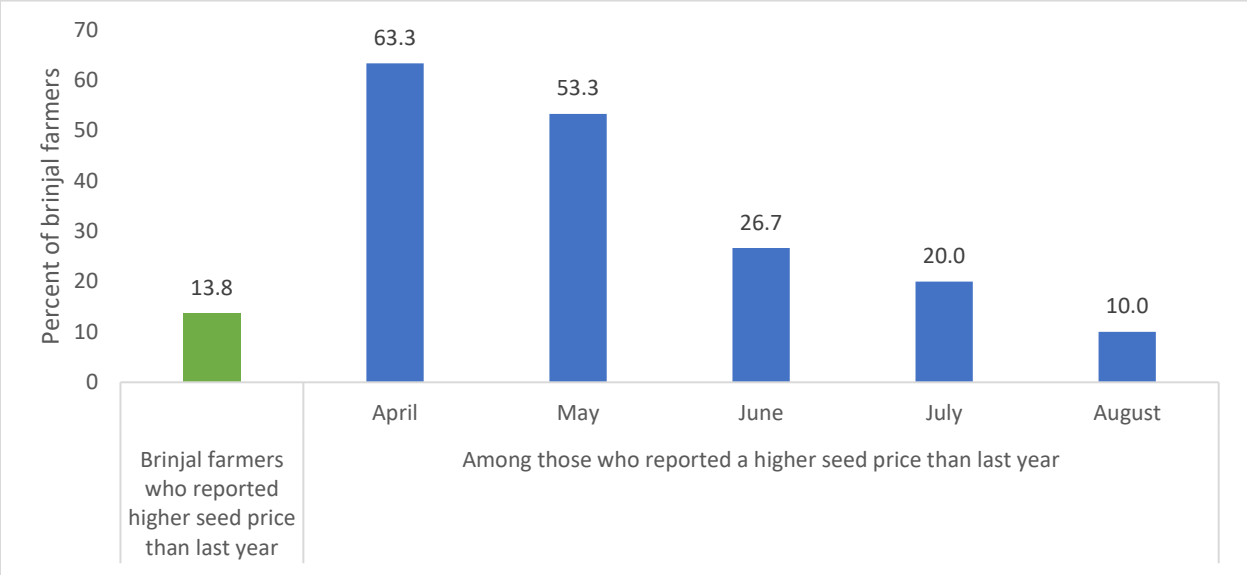
Figure 5.11 Percent of brinjal farmers who faced higher price in agricultural inputs (compared to last year) at least in one month in April-August 2020



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 5.12 shows that 13.8 percent of brinjal farmers in the ZOI reported higher seed prices than 2019. Among those farmers who reported higher seed prices, most farmers reported this taking place in the months immediately following the outbreak.

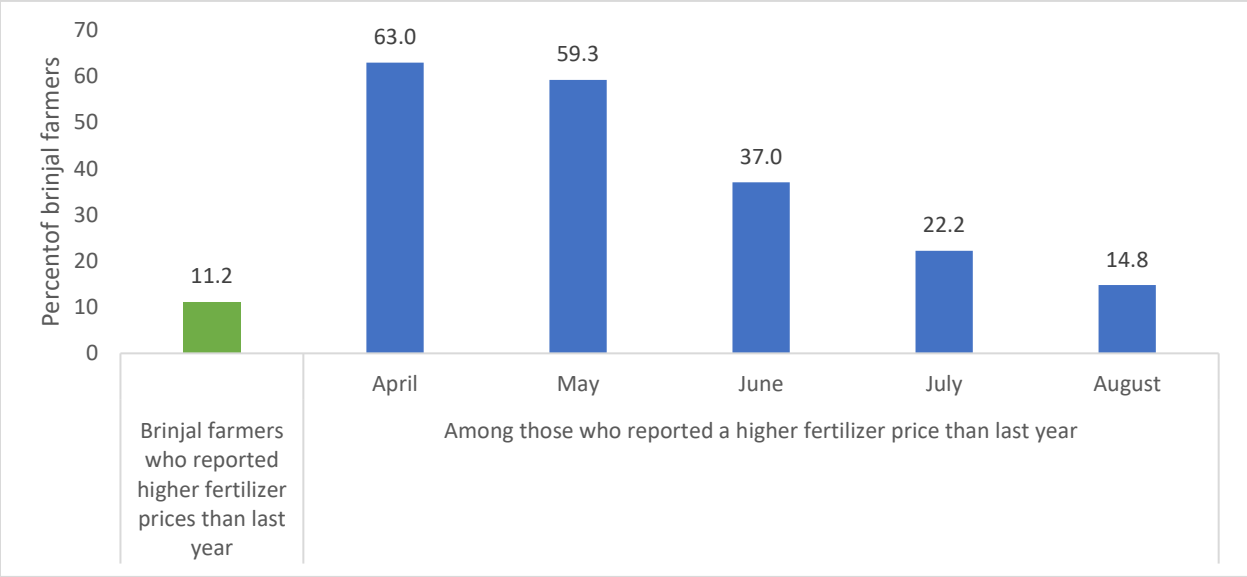
Figure 5.12 Percent of brinjal farmers who reported higher seed prices than last year, by month



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 5.13, which shows the proportion of brinjal farmers who report higher fertilizer prices than last year, follows a similar trend as the seed prices. Among the 11.2 percent of brinjal farmers who reported higher fertilizer prices between April and August 2020 compared with 2019, the majority of farmers reported this in April (63.0 percent) and May (59.3 percent), which gradually declines until 14.8 percent in August 2020.

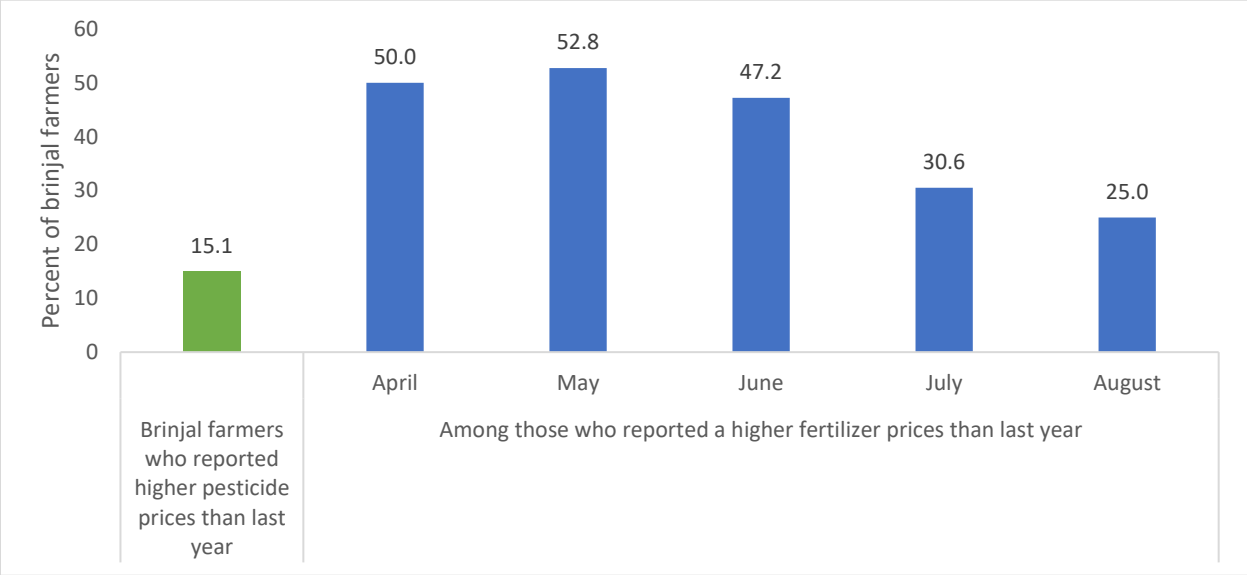
Figure 5.13 Percent of brinjal farmers who reported higher fertilizer prices than last year, by month



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

15.1 percent of brinjal farmers reported higher pesticide prices between April and August 2020 compared with the same timeframe last year (**Figure 5.14**). About half of brinjal farmers reported this to be the case in the early months of the COVID-19 outbreak, and steadily decreased to one-quarter of brinjal farmers who thought fertilizer prices were higher in August 2020 compared with August 2019.

Figure 5.14 Percent of brinjal farmers who reported higher pesticide prices than last year, by month



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

5.3 FLOWERS

Flower cultivation has emerged as a fast-growing agricultural product in Bangladesh. Commercial production of flowers started in mid-1980s in Jhikargacha upazila of Jashore district (Mou 2012). Commercial cultivation of flowers has become popular among farmers in several districts in the Feed the Future ZOI.

In IFPRI's phone survey, 93 flower farmers were interviewed in the Feed the Future ZOI. From the population-based sample in the Feed the Future ZOI, the survey team contacted five flower farmers from the ZOI sample, who then provided additional flower farmers to sample through a snowball sampling strategy. Moreover, the research team collected additional phone numbers of flower farmers from agricultural extension officials located in Chuadanga, Jashore, and Jhenaidah districts in the Feed the Future ZOI.

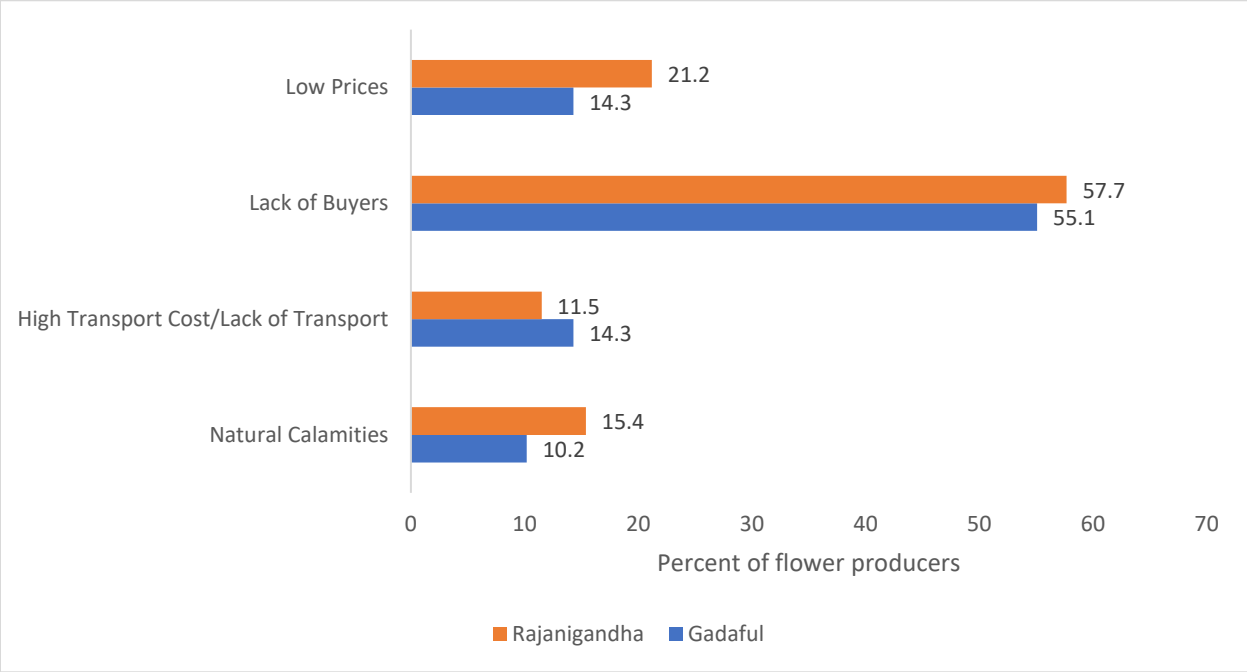
On average, each farmer produced 2.4 types of flowers between April-August 2020. The most popular type of flower crop is *Rajanigandha* flower, or Tuberose in English, with 23.6 percent of flower farmers cultivating this crop between April-August 2020. The second most popular type of flower crop is *Gada* flower, or marigold in English, with 22.3 percent reporting to have cultivated it during the same period.

This analysis focuses on two types of flower farmers: Gadaful and Rajanigandha.

Figure 5.15 shows the percentage of flower farmers in the ZOI who could not sell for at least one month between April-August 2020, by gadaful and rajanigandha flower farmers.

Over half of the surveyed flower farmers could not sell for at least a month due to a lack of buyers, followed by low prices. There was a slightly higher proportion of rajanigandha flower farmers (15.4 percent) who were affected by natural calamities than gadaful flower farmers (10.2 percent).

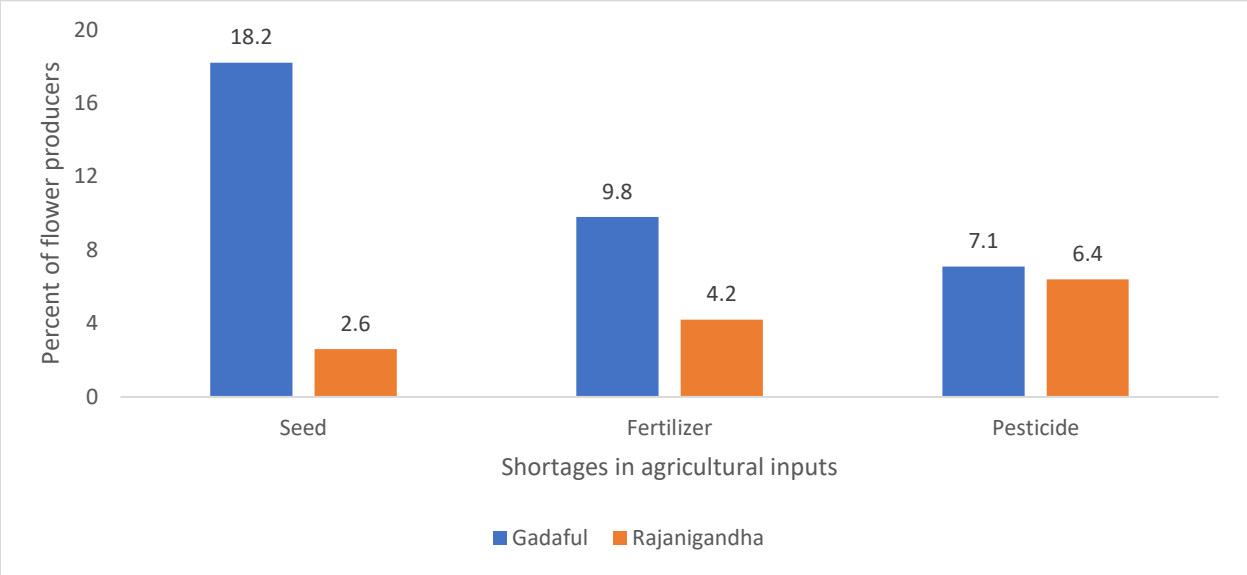
Figure 5.15 Percent of flower farmers who were not able to sell at least in one month between April-August 2020 due to COVID-related issues



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 5.16 shows the disparities in agricultural input market shortages between gadaful and rajanigandha flower farmers in the ZOI. Overall, a higher proportion of gadaful flower farmers reported market shortages across all agricultural inputs compared with rajanigandha flower farmers. The proportion of gadaful flower farmers who reported seed market shortages was seven-times higher than rajanigandha flower farmers, and about 2.3-times higher for fertilizer market shortages.

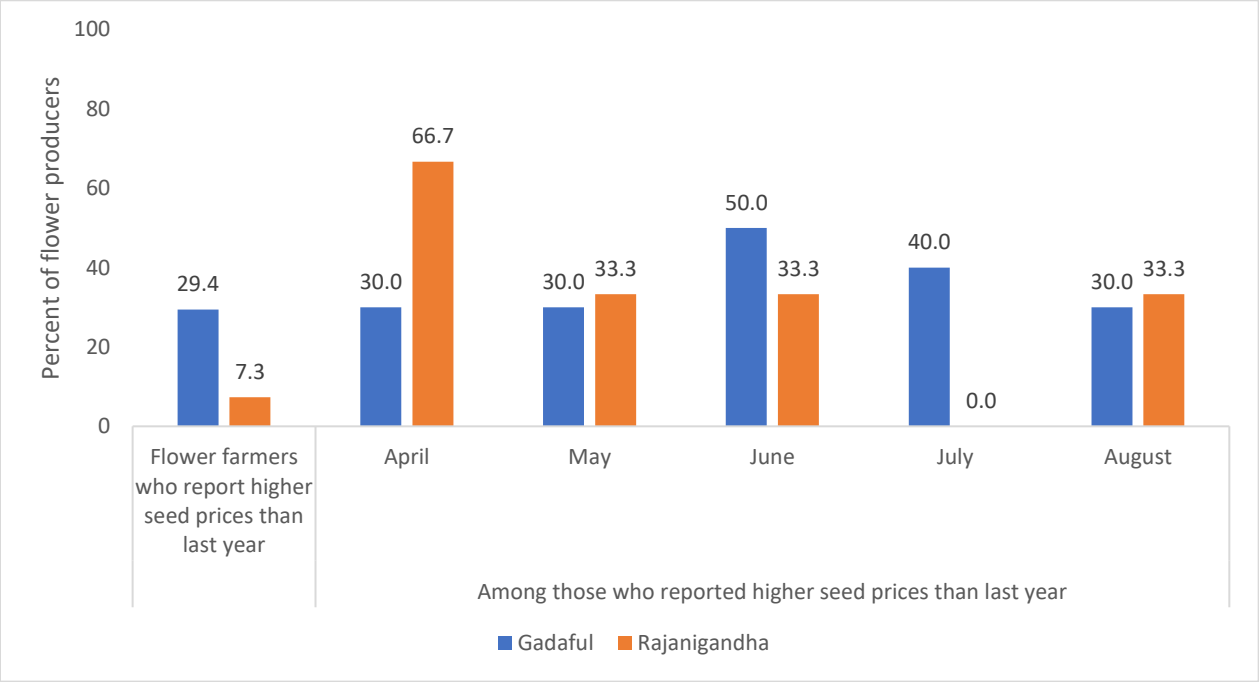
Figure 5.16 Percent of flower farmers who faced market shortages in agricultural inputs (April-August 2020)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

About one-third (29.4 percent) of gadaful flower farmers reported higher seed prices versus last year, compared with 7.3 percent of rajanigandha flower farmers in the ZOI (**Figure 5.17**). Among the 34 gadaful flower farmers who reported higher seed prices in 2020 than in 2019, half reported this in June 2020. Among the 41 rajanigandha flower farmers, two-thirds (66.7 percent) observed higher seed prices in April 2020 compared with April 2019. The proportion of rajanigandha flower farmers who reported higher seed prices compared with last year dropped to one-third from May through August 2020.

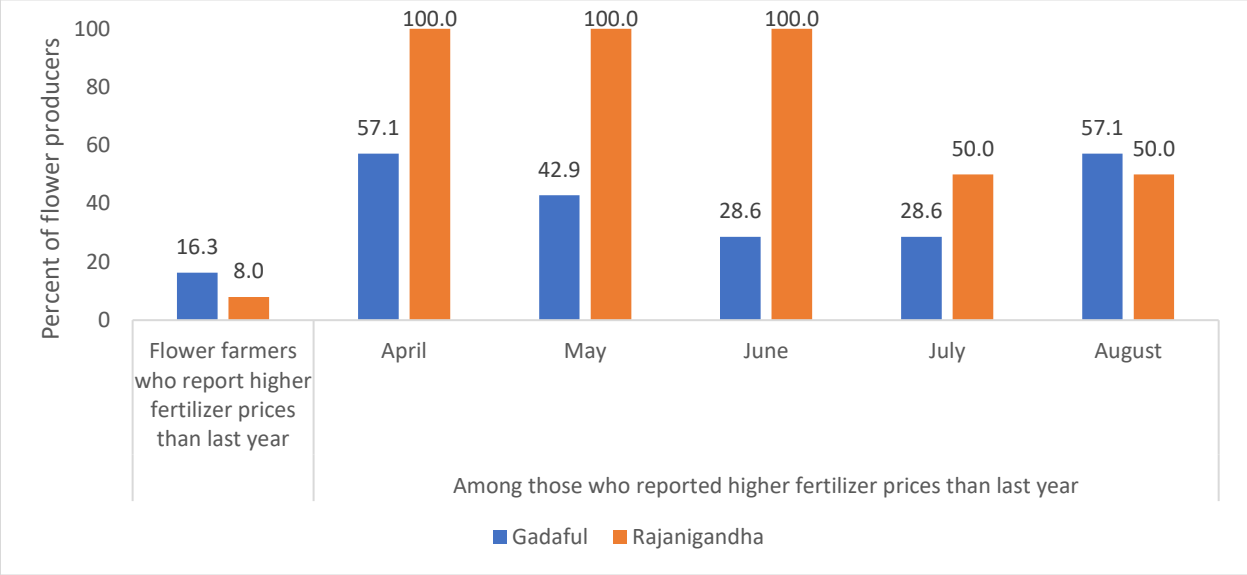
Figure 5.17 Percent of flower farmers who reported higher seed prices than last year, by month and flower farmer



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 5.18 shows that 16.3 percent of gadaful flower farmers reported higher fertilizer prices in 2020 than in 2019. Among 43 gadaful flower farmers, most farmers reported higher fertilizer prices in April and August 2020 (57.1 percent for both). On the other hand, only 8.0 percent of rajanigandha flower farmers reported higher fertilizer prices this year than last year. All 50 rajanigandha flower farmers who reported higher fertilizer prices in 2020 reported this between April and June 2020, and half reported higher fertilizer prices in July and August 2020. This suggests that while the fertilizer prices may have improved, prices did not recover to pre-COVID prices.

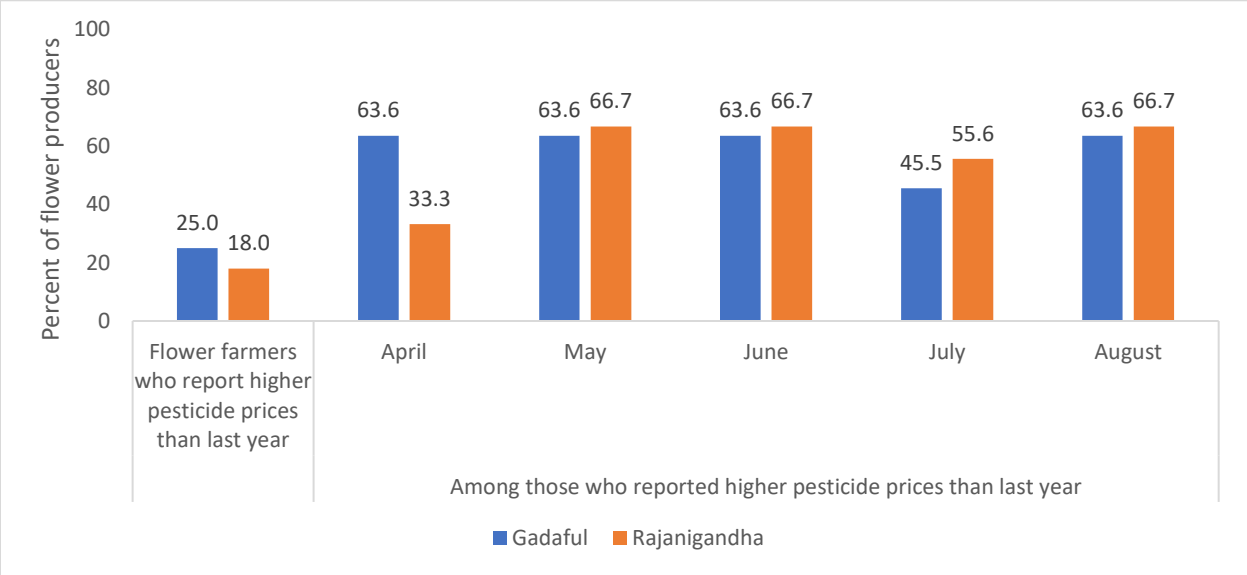
Figure 5.18 Percent of flower farmers who reported higher fertilizer prices than last year, by month and flower farmer



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 5.19 illustrates the percent of flower farmers in the ZOI who reported higher pesticide prices than last year, by month. Overall, one-quarter of gadaful flower farmers reported higher pesticide prices, which remained relatively consistent between April and August 2020. Although there was a slight decline in July 2020—from 63.6 percent to 45.5 percent—this may be observed due to the relatively small sample size. In contrast, 18.0 percent of rajanigandha flower farmers reported higher pesticide prices, which steadily increased from April through August 2020.

Figure 5.19 Percent of flower farmers who reported higher pesticide prices than last year, by month and flower farmer



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

5.4 JUTE

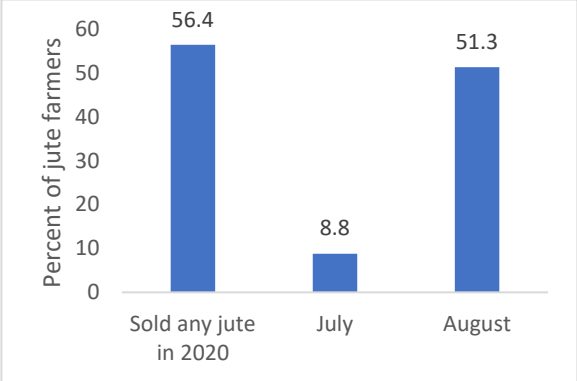
There are two types of jute grown in Bangladesh: White and Tossa. White jute is sown between early March and mid-April, and Tossa is sown from Mid-April to early May. White jute is harvested from July to August, and Tossa, from August to September (BBS 2018).

In recent years, jute has grown significantly, both in terms of share of cropped area and its contribution to the growth of the agriculture sector. Between 2007/2008 and 2014/2015, the average crop area under jute nationally grew by 8.4 percent (FPMU 2019). Although the area under jute cultivation only grew by 1.5 percent between 2015/2016 and 2018/2019, many other crops—for example, wheat, oilseeds and spices, pulses, potatoes, and sugarcane—declined over the same reference period (FPMU 2019). Yet in the Feed the Future ZOI, the share of cropped area under jute *decreased* by 16.3 percent, from 9.8 percent at 2011/2012 baseline to 8.2 percent in 2018/2019 endline (IFPRI, forthcoming).

How has the COVID-19 pandemic affected jute farmers in Bangladesh?

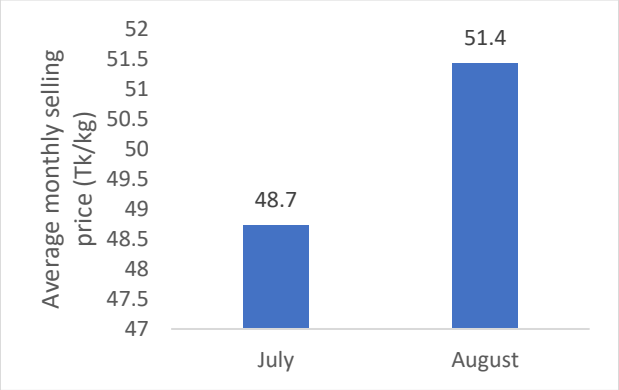
Figure 5.20 and **Figure 5.21** show the proportion of farmers who sold jute in 2020 among those who produced, and the average monthly selling price between July and August 2020. Over half (51.3 percent) of ZOI farmers did sold any jute in August when most farmers harvested their jute crop. Jute farmers who sold in August 2020 fetched slightly higher price than those who sold in July, although the difference in the average selling price between the two months is not large.

Figure 5.20 Percent of farmers who sold jute in 2020 (among those who produced)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

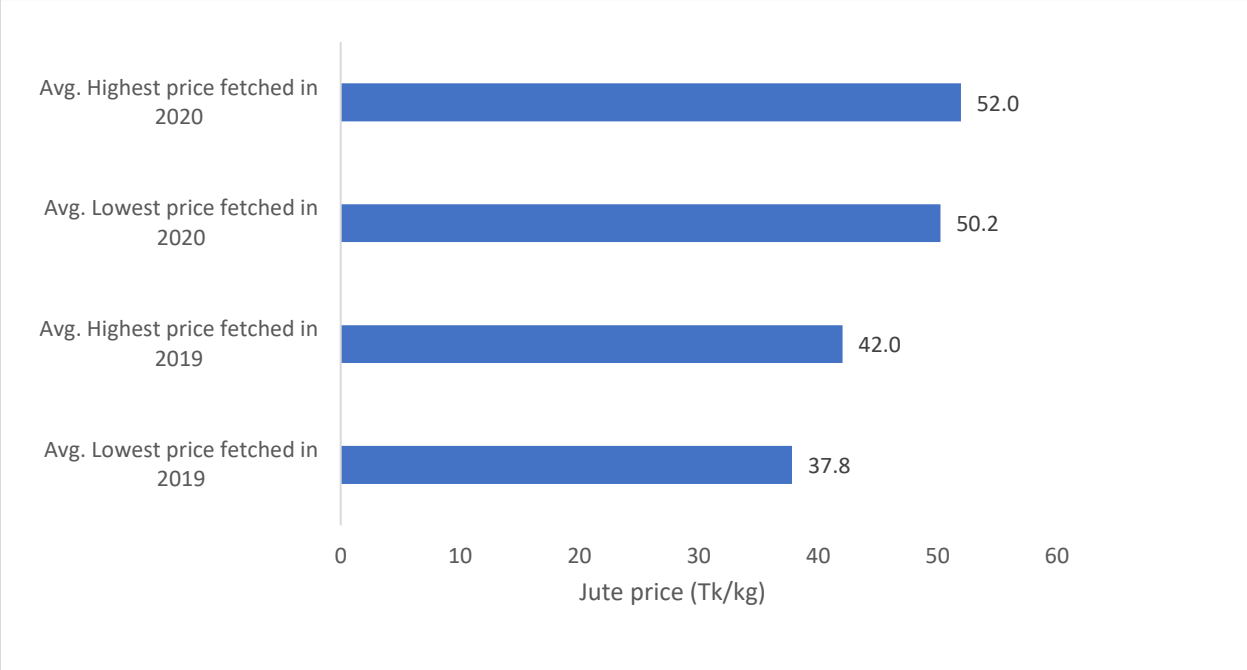
Figure 5.21 Average monthly selling price of jute, July-August 2020



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Overall, jute prices were higher in 2020 than in 2019 (**Figure 5.22**), likely in part due to changes in Indian trade policy enacted in 2019. In January 2017, India—a major importer of Bangladeshi jute products—had imposed an anti-dumping duty on jute yarn and twine, Hessian fabric, and jute sacking bags from Bangladesh and Nepal. In June 2019, India expanded this duty to apply to jute sacking cloth imported from Bangladesh, which reduced jute demand and, in turn, prices in 2019 (Daily Star 2019). The average highest price that jute farmers received was Tk 42/kg in 2019 compared with Tk 52/kg in 2020.

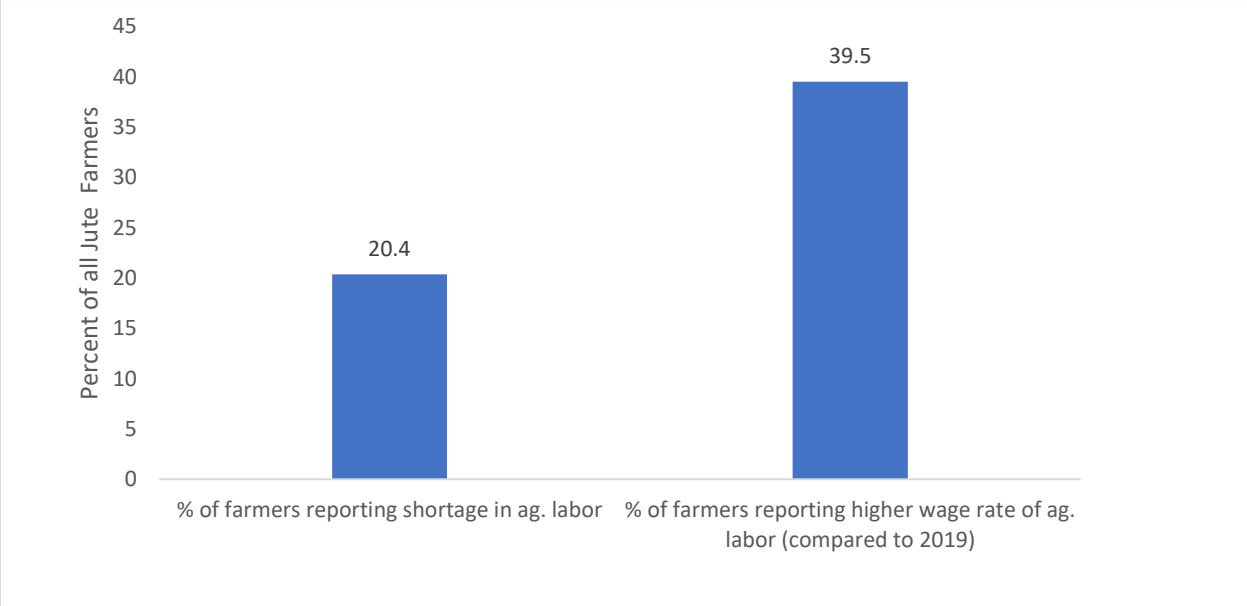
Figure 5.22 Jute prices, comparing 2019 and 2020



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 5.23 provides data on the share of sample jute farmers in the ZOI who reported a market shortage of agricultural labor, as well as higher wage rate for agricultural labor this year compared to the previous year. Among the 614 jute farmers surveyed in the ZOI, 20.4 percent experienced agricultural labor market shortages, while twice as many reported a higher wage rate for agricultural laborer compared with last year.

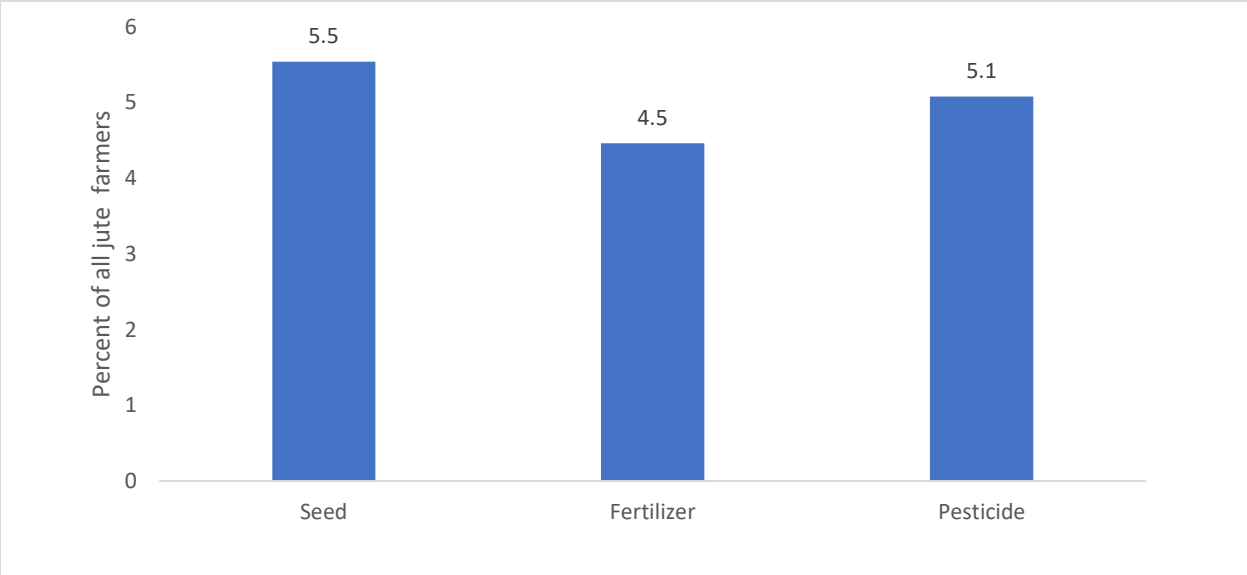
Figure 5.23 Percent of jute farmers who reported market shortages in and higher wage rates of agricultural labor (compared to last year)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 5.24 demonstrates seed market shortage information reported by jute farmers in the ZOI. Among the 614 jute farmers in the sample, only 5.5 percent reported to have faced seed market shortages in the market. The numbers are similar for reported market shortages in the availability of fertilizers and pesticides in the market, which are 4.5 percent and 5.1 percent, respectively.

Figure 5.24 Percent of jute farmers who reported market shortages in seed, fertilizer or pesticide in the market between April-August, 2020

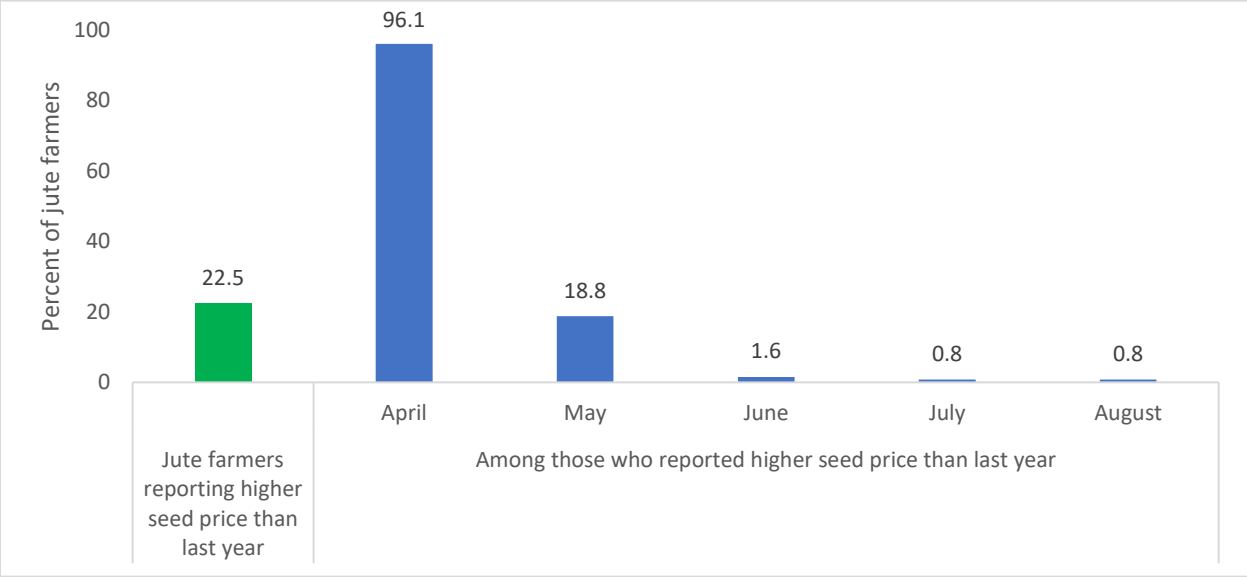


Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 5.25 examines the reported changes in jute seed prices from last year. Nearly one-quarter (22.5 percent) of jute farmers in the ZOI found that seed prices were higher in 2020 than in 2019.

Among these farmers, virtually all (96.1 percent) indicated that seed prices were higher in April than last year while around one-fifth (18.8 percent) of these farmers report the persistence of higher seed prices in May. It is worthwhile to note that the demand for jute seed is supposed to decrease mechanically after May, by which time most of the sowing would be completed. However, the reported decrease in market prices of jute seed in May (compared to April) indicate that the inefficiency in the market arising due to the lockdown subsided considerably in May, at least for jute seeds.

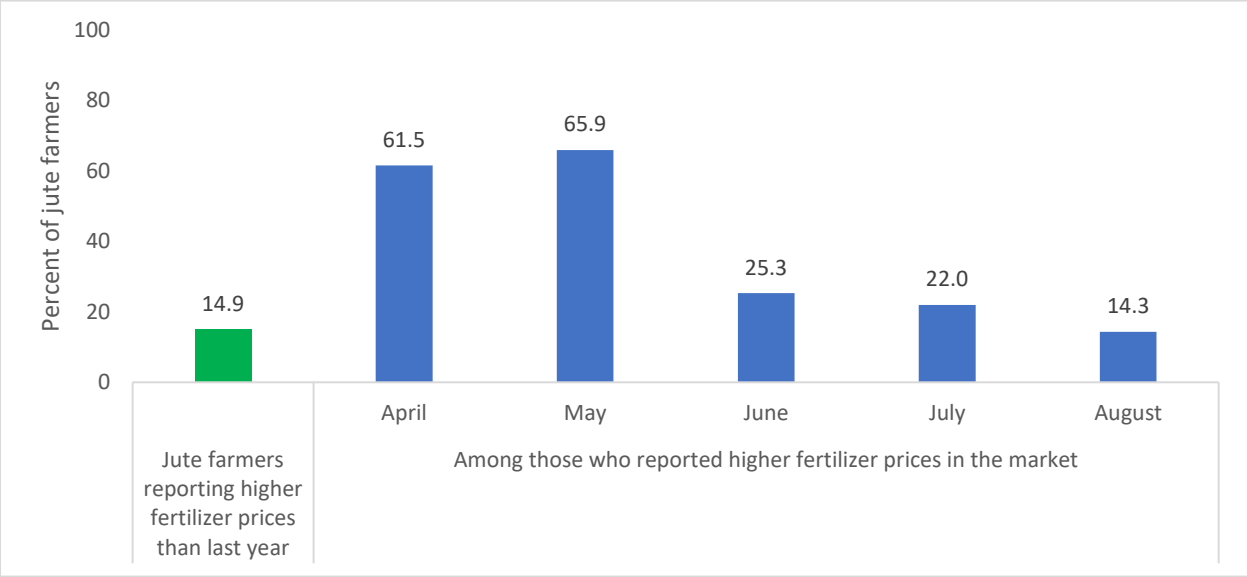
Figure 5.25 Percent of jute farmers who reported higher seed prices than last year, by month



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

The farmers' phone survey results show that 14.9 percent of jute farmers reported higher fertilizer prices than 2019 (**Figure 5.26**). 61.5 percent and 65.9 percent of these farmers indicate in April and May as the main months when fertilizer prices were higher compared to the previous year.

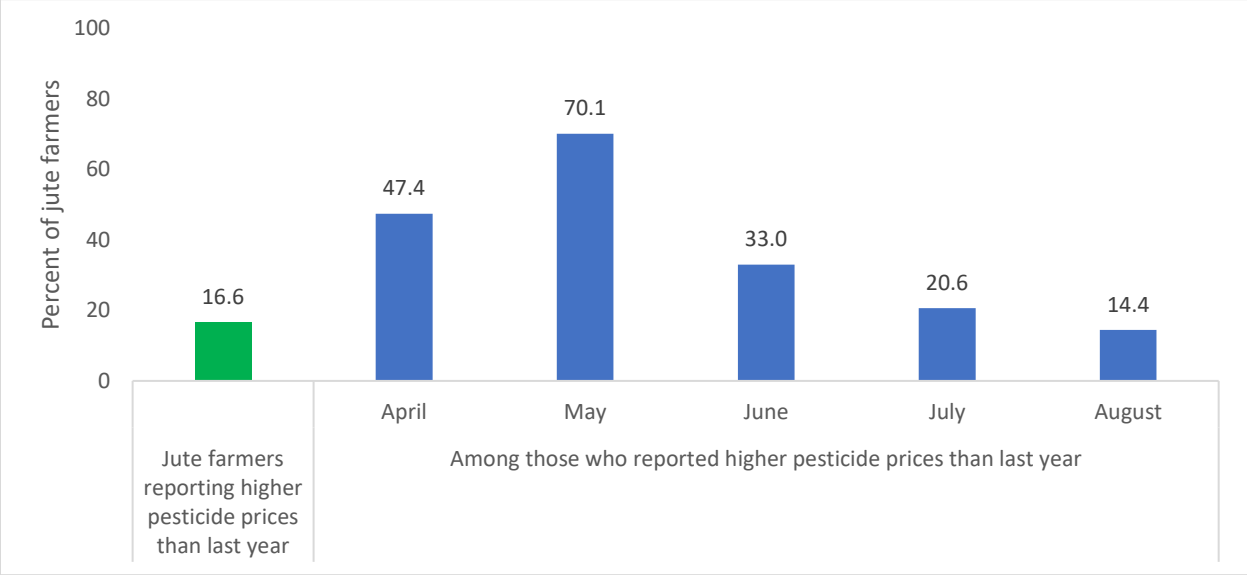
Figure 5.26 Percent of jute farmers who reported higher fertilizer prices than last year, by month



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 5.27 shows that 16.6 percent of the sample jute farmers reported higher pesticide prices in 2020 than in 2019. Among the farmers who reported pesticide market shortages, most observed this supply issue in April and May 2020. This, in turn, likely raised pesticide prices during this same time period compared with last year. Among those farmers who reported higher pesticide prices, nearly half (47.4 percent) noted this in April, up to 70.1 percent in May, and one-third (33.0 percent) in June.

Figure 5.27 Percent of jute farmers who reported higher pesticide prices than last year, by month



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

6 NON-CROP AGRICULTURE

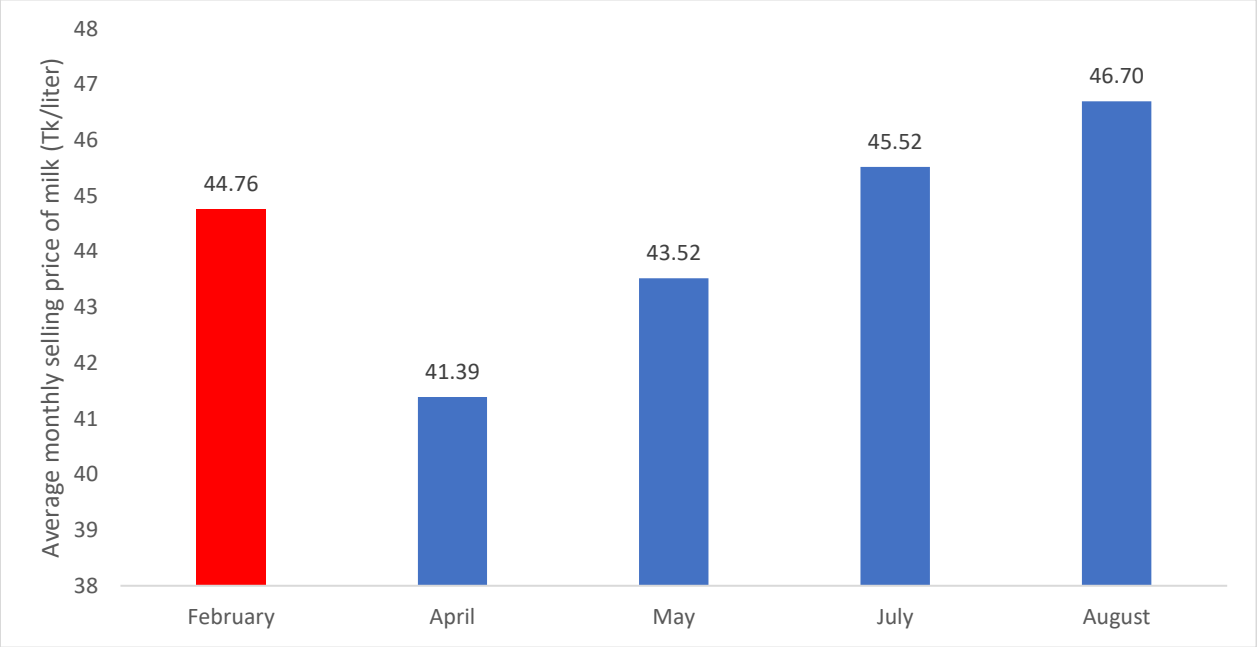
6.1 DAIRY FARMING

Given the challenges and the opportunities presented by the dairy value chain for improving farmers' income and potentially household nutrition, USAID has identified dairy farming as a targeted value chain in the Feed the Future ZOI.

150 dairy farmers were interviewed under IFPRI's farmers' phone survey.

Figure 6.1 shows average monthly selling price of milk (Tk/liter) reported by survey farmers in the ZOI. Prior to Covid-19 lockdown, the average selling price of milk was Tk 44.76 per liter in February 2020. During the months of lockdown – April and May – the selling price of milk declined to Tk 41.39/liter and Tk 43.52/liter, respectively. As the economy began to recover, the price of milk gradually increased. Farmers reported even slightly higher price of Tk 46.70/liter in in August, compared to the pre-COVID price in February.

Figure 6.1 Average monthly selling price of milk (Tk/liter), by month



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

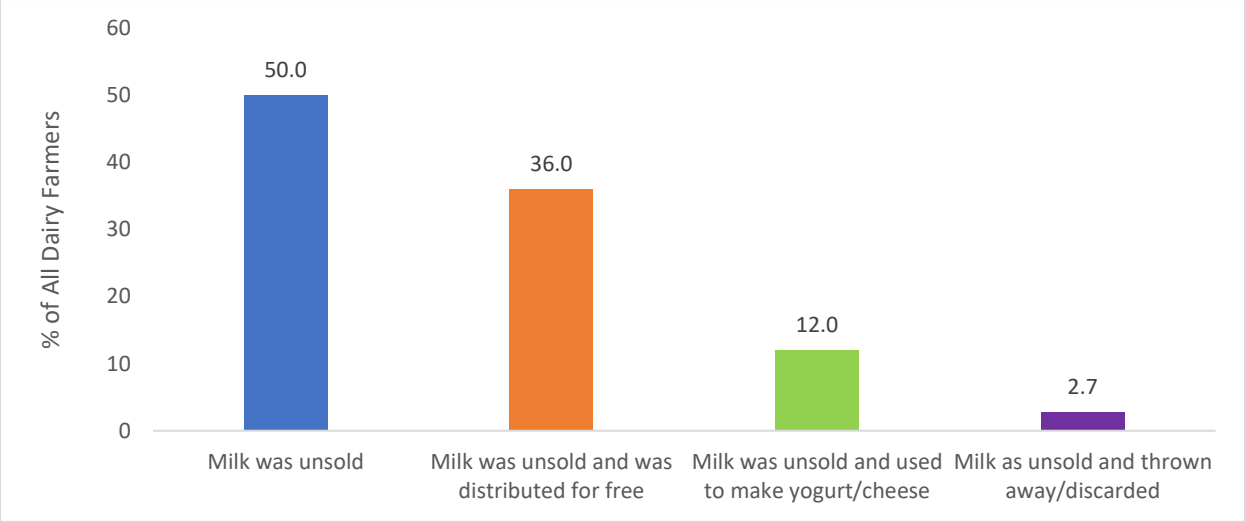
Figure 6.2 presents information on the proportion of the sample dairy farmers who were unable to sell milk in at least one month between April and August 2020, for various reasons. Lack of buyers of milk was cited as the reason for not being able to sell by 4.7 percent of all dairy farmers. This is followed by 3.4 percent of the dairy farmers who reported low price to be the cause for being unable to sell milk, and 2 percent of dairy farmers identified high transport cost or lack of transport to be the main cause for being unable to sell milk at some point in the April-August period.

Figure 6.2 Reasons identified by dairy farmers for not being able to sell milk for at least one month during April-August 2020

Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 6.3 shows that 50 percent of all dairy farmers in the sample were unable to sell milk at least once during April-August, 2020. 36 percent of all dairy farmers (who were unable to sell milk at least once during April-August, 2020), distributed the unsold milk for free. 12 percent of the dairy farmers (who were unable to sell milk at least once between April-August, 2020), used the unsold milk to prepare yogurt and/or cheese. About 2.7 percent of the dairy farmers (who were unable to sell milk at least once between April-August 2020) threw away the milk that was unsold.

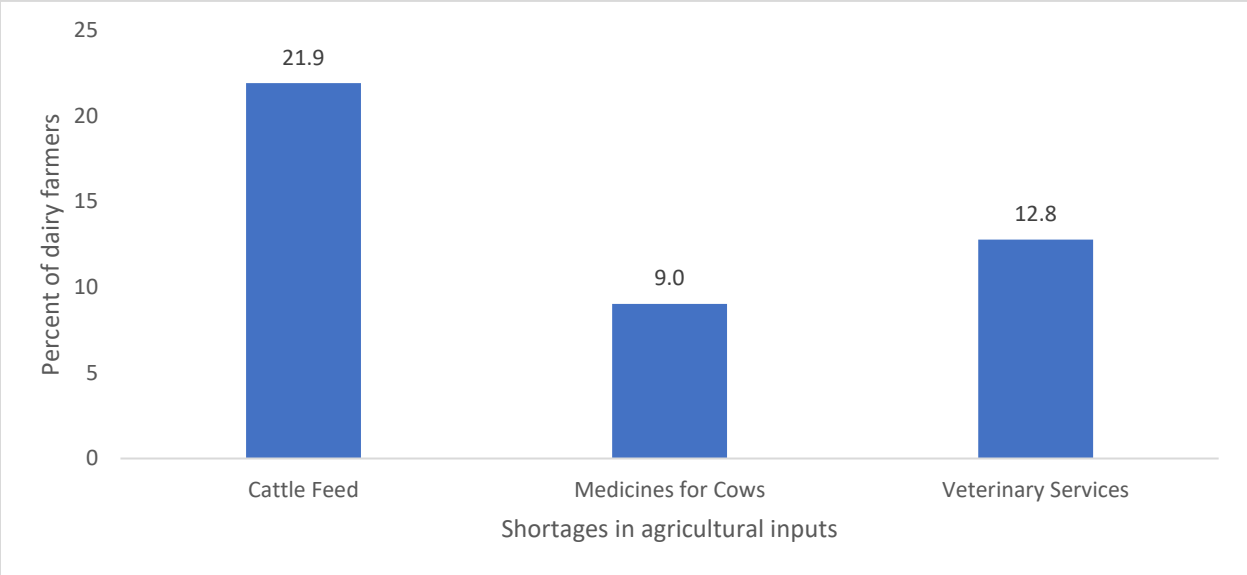
Figure 6.3 Milk was unsold at least once during April-August, 2020 (all dairy farmers)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 6.4 presents the share of dairy farmers who reported market shortages in inputs during April-August 2020. More than one-fifth (21.9 percent) of the dairy farmers reported market shortages in cattle feed, 12.8 percent of the dairy farmers faced a market shortage in veterinary services, and 9.0 percent reported market shortage in cattle medicine.

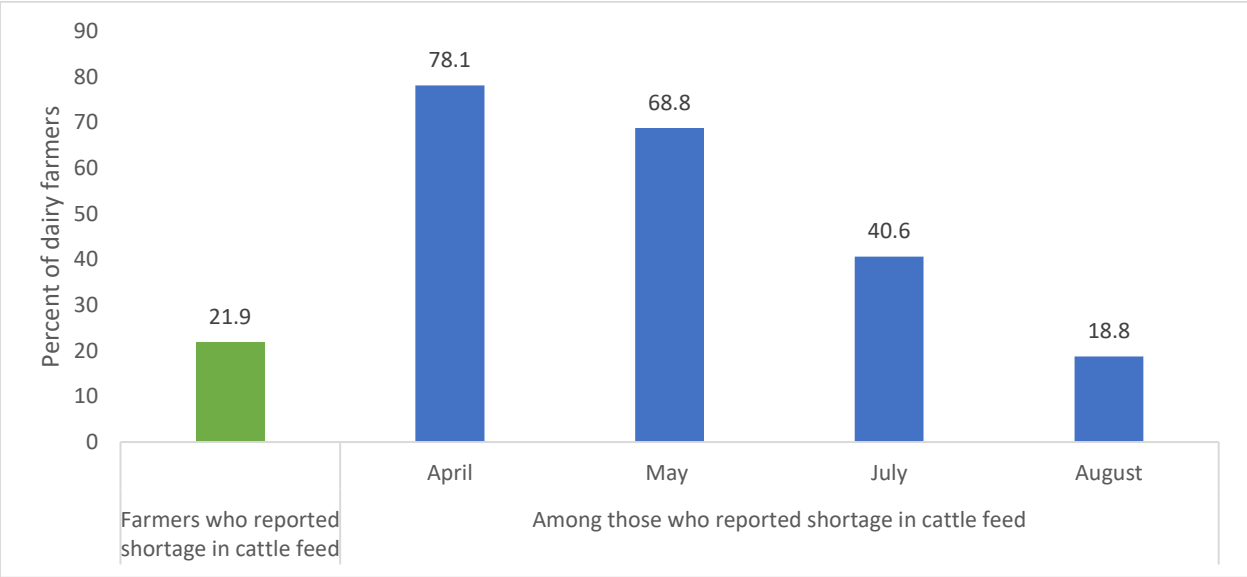
Figure 6.4 Percentage of dairy farmers who reported market shortage in inputs during April-Aug 2020, by input categories



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 6.5 presents month-wise frequency of those dairy farmers who reported market shortage in cattle feed during April-August 2020. Most of these farmers faced market shortages in April (78.1 percent) and May (68.8 percent). Once the lockdown was lifted, fewer farmers reported market shortages over time.

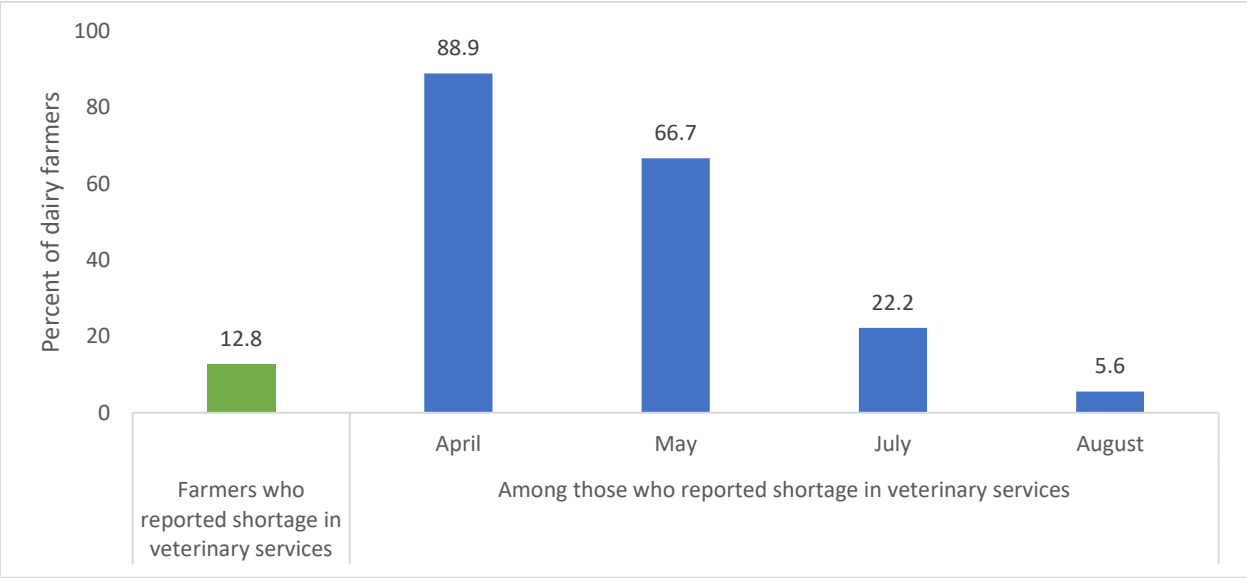
Figure 6.5 Percentage of dairy farmers who reported market shortages in cattle feed



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 6.6 presents month-wise frequency of those dairy farmers who reported market shortage in veterinary services during April-August 2020. Similar to Figure 4.7, most of these farmers faced market shortages in April (88.9 percent) and May 2020 (66.7 percent). After the lockdown was lifted, fewer farmers reported market shortages over time.

Figure 6.6 Percentage of dairy farmers who reported market shortage in veterinary services



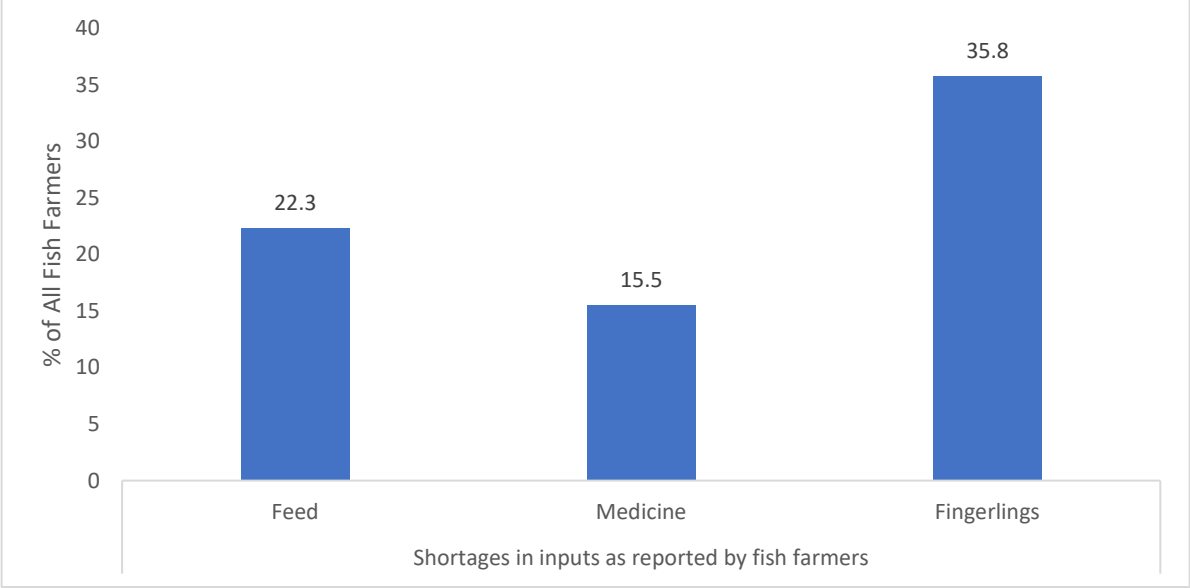
Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

6.2 FISH FARMING

USAID has various activities that aim to support fish farming or aquaculture in the Feed the Future ZOI. For this phone survey, a total of 190 fish farmers were interviewed from the Feed the Future ZOI.

Figure 6.7 shows fish farmers who faced market shortages in fish feed, medicines, and fingerlings in the months following the COVID-19 outbreak. More than one-third (35.8 percent) of fish farmers reported a market shortage of fingerlings.

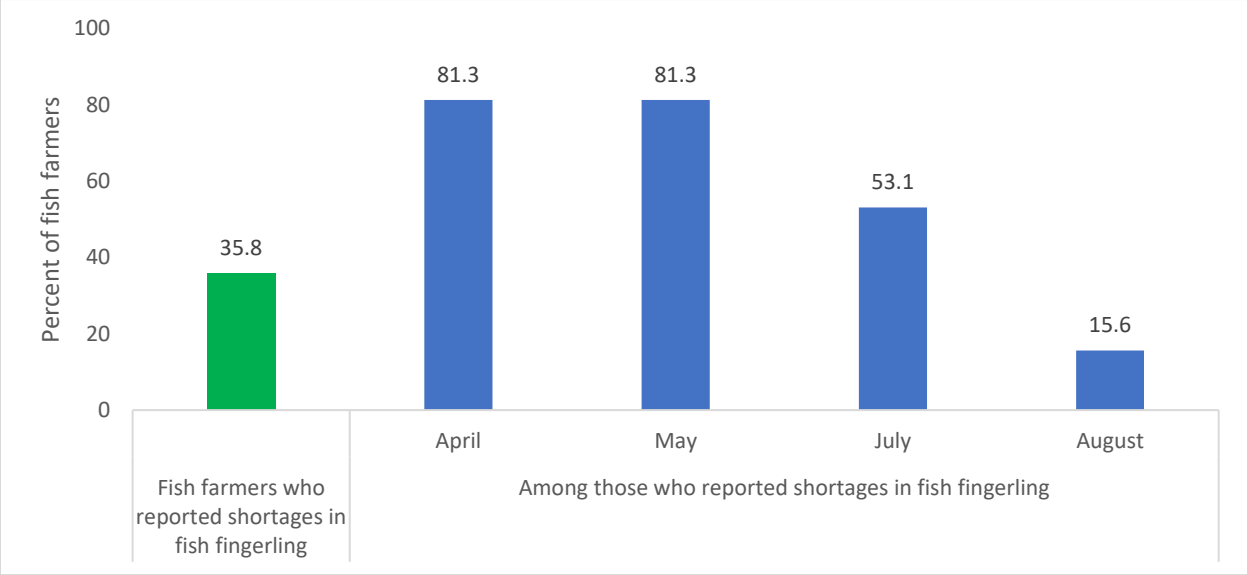
Figure 6.7 Percent of fish farmers who faced market shortages in inputs (April-August 2020)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 6.8 shows that, among the 35.8 percent surveyed fish farmers who reported market shortages in fish fingerlings, most of the market shortages was concentrated in April and May 2020 (81.3 percent for both).

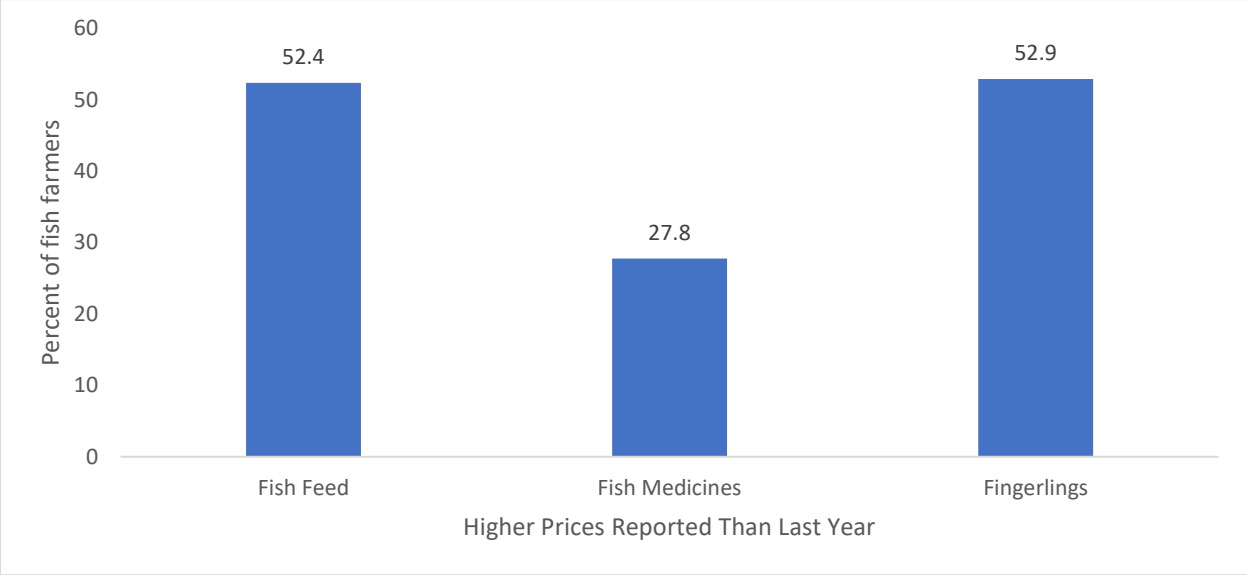
Figure 6.8 Percent of fish farmers who reported market shortages in fish fingerlings (April-August 2020), by month



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 6.9 shows large shares of fish farmers experienced increased prices of key inputs for fish farming (at least in month) between April and August 2020 compared to the same period in 2019. Over half of the sample fish farmers in the ZOI report higher prices in fish feed and fingerlings, and over one-quarter report the same for fish medicines.

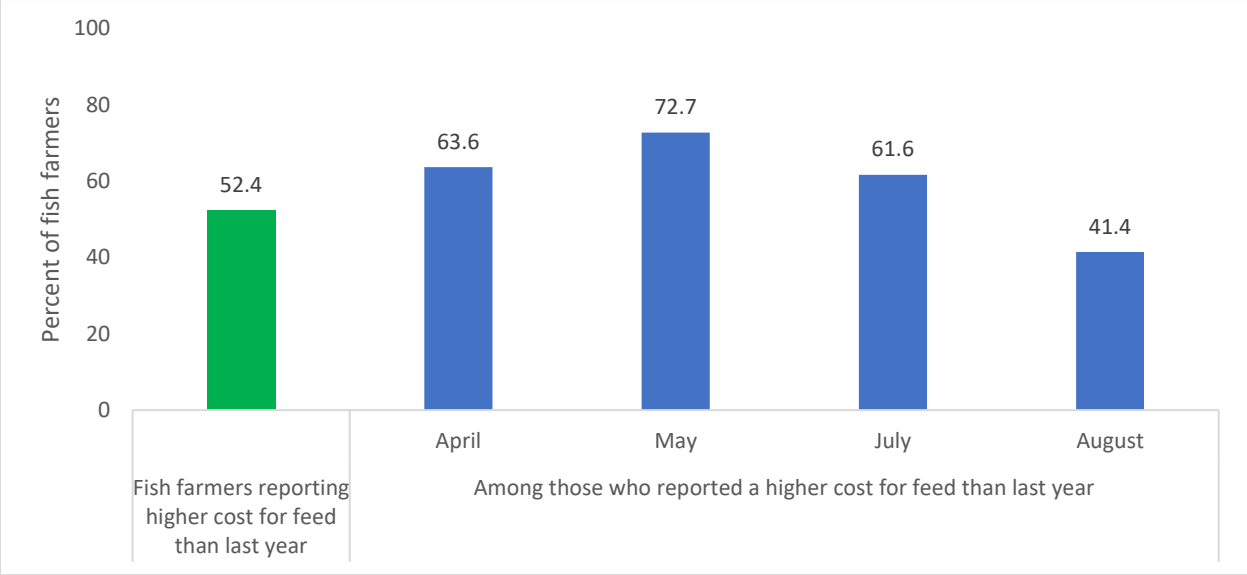
Figure 6.9 Percent of fish farmers who reported increased prices for various agricultural inputs (April-August 2020)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

According to **Figure 6.10**, over half (52.4 percent) of fish farmers reported that prices increased for feed compared with 2019. Although the proportion of fish farmers reporting higher costs for feed started declining from July 2020, there were still 41.4 percent of fish farmers (adversely affected by higher prices) who reported higher feed prices in August compared to last year. This suggests that rising costs of fish feed sustained for several months after the initial onset of COVID-19, and with relatively unsuccessful efforts at mitigating these price disruptions for this input.

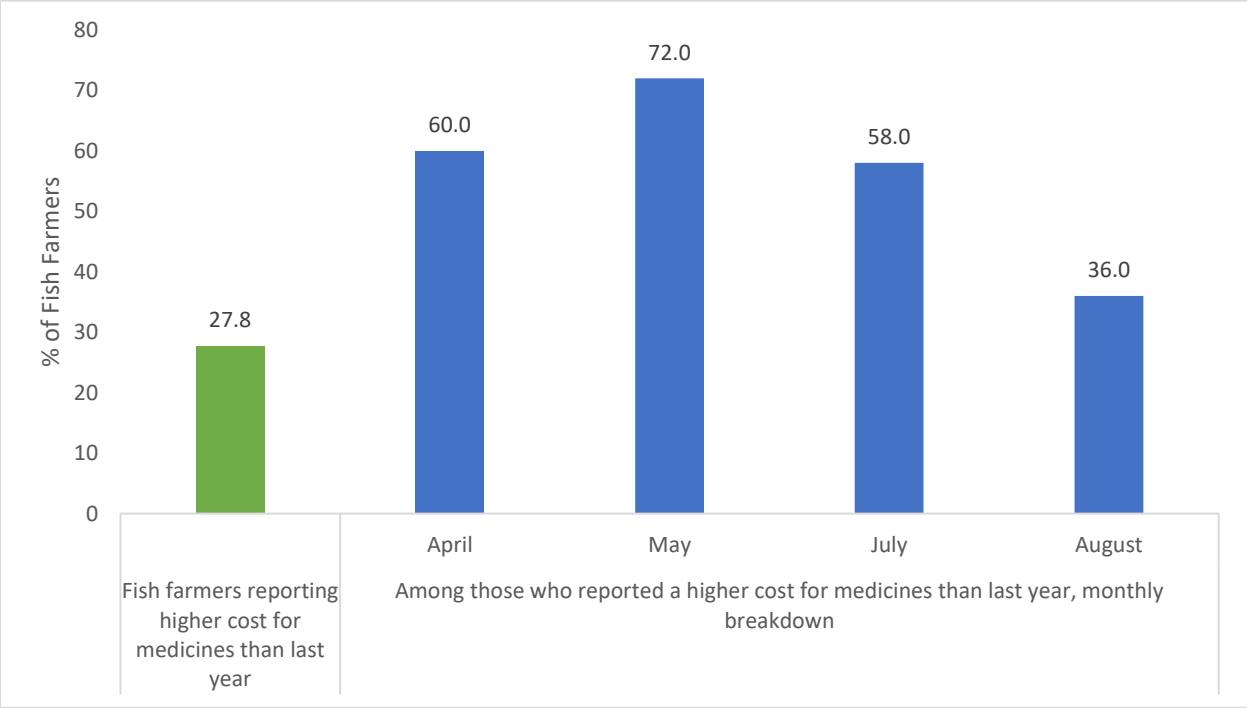
Figure 6.10 Percent of fish farmers who reported higher costs for feed than last year, by month



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

About one-quarter (27.8 percent) of surveyed fish farmers in the ZOI reported higher medicine costs than 2019 (**Figure 6.11**). Among this sub-sample, the majority of fish farmers reported higher costs for fish medicine in April and May 2020 (60 percent and 72 percent, respectively). The proportion of fish farmers who reported higher costs compared with that same time last year slightly declined in July and August, yet 41.4 percent of (adversely affected) fish farmers in August 2020 still report that prices are higher than in 2019.

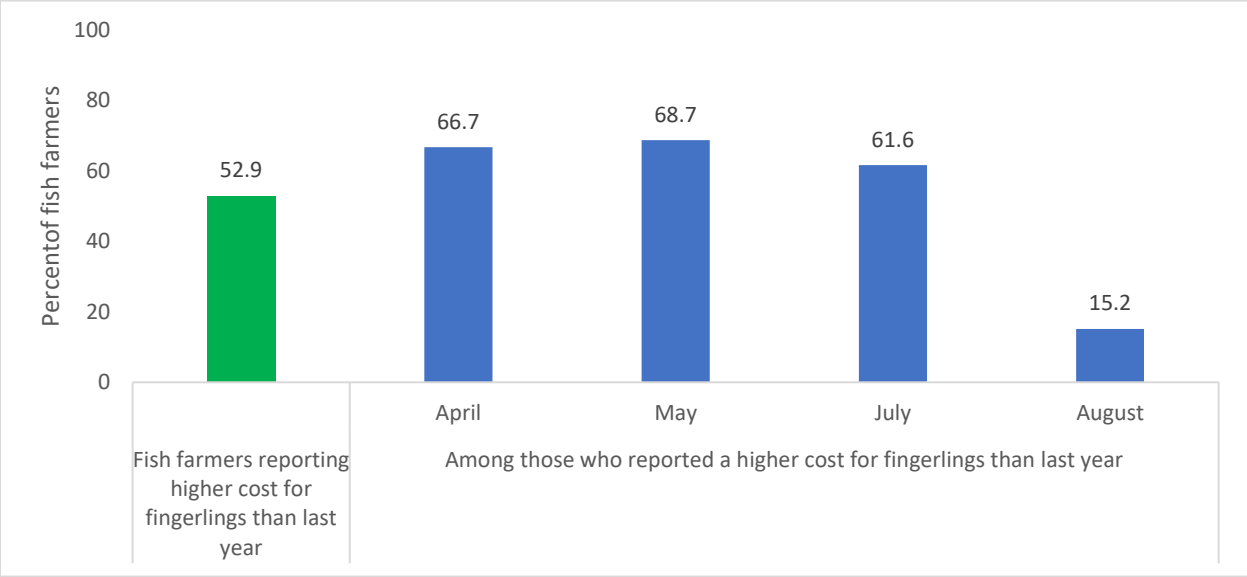
Figure 6.11 Percent of fish farmers who reported higher costs for fish medicines than last year, by month



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 6.12 shows that over half (52.9 percent) of fish farmers in the ZOI report higher fingerling prices compared with last year. Among this sub-sample, about two-thirds of fish farmers reported higher prices in April, May, and July, which dropped to 15.2 percent in August 2020.

Figure 6.12 Percent of fish farmers who reported higher costs for fingerlings than last year, by month



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

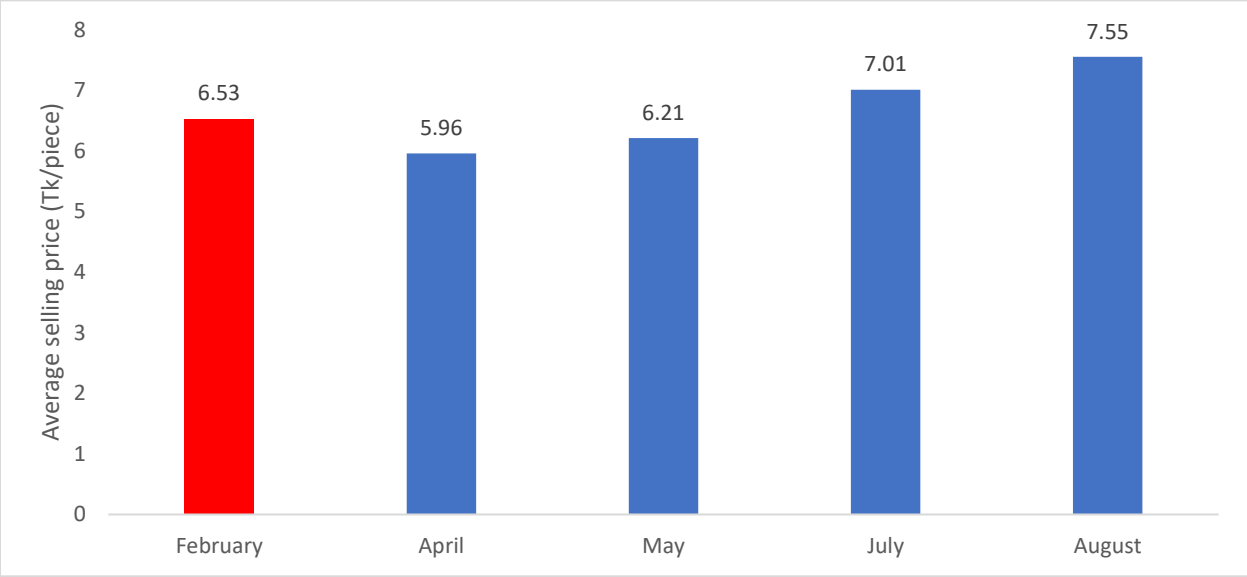
6.3 POULTRY FARMING

6.3.1 Egg Farmers

In the Feed the Future ZOI, 36 egg producers and 65 broiler producers were surveyed.

Figure 6.13 shows that average selling price of eggs dipped by nearly 9 percent between February (pre-COVID-19 reference month) and April 2020, but recovered by July 2020.

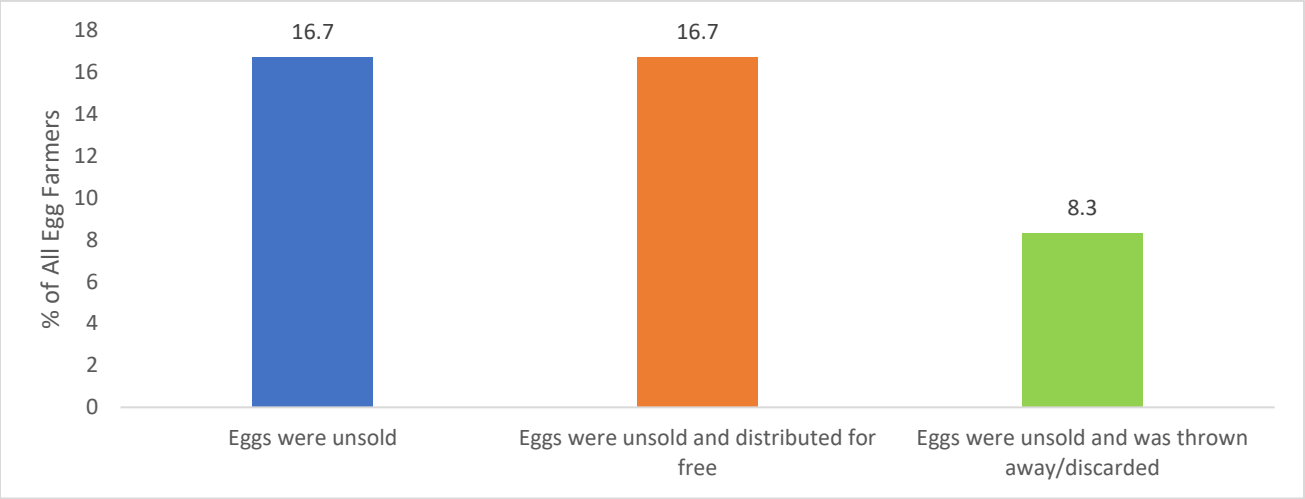
Figure 6.13 Average monthly selling price of eggs (Tk/piece), by month



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Among all the egg farmers in the sample, 16.7 percent were unable to sell their eggs at least once between April-August 2020 (**Figure 6.14**). 16.7 percent of egg farmers (who were unable to sell their eggs at least once between April-August 2020) distributed unsold eggs for free, and 8.3 percent of the egg farmers (who were unable to sell their eggs at least once between April-August 2020) discarded unsold eggs.

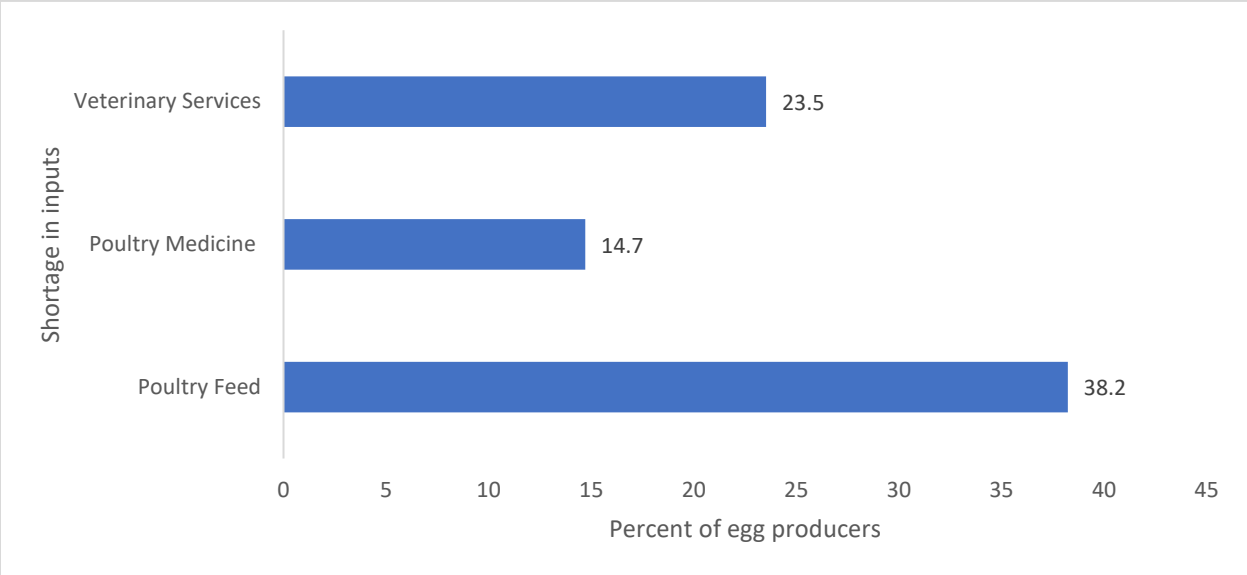
Figure 6.14 Eggs were unsold at least once during April-August, 2020 (all egg farmers)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

A relatively high proportion of surveyed poultry farmers in the ZOI faced agricultural input market shortages (**Figure 6.15**). Nearly two-fifths (38.2 percent) of farmers reported market shortages of poultry feed, nearly one-quarter (23.5 percent) reported market shortages in veterinary services, and 14.7 percent reported market shortages in poultry medicine.

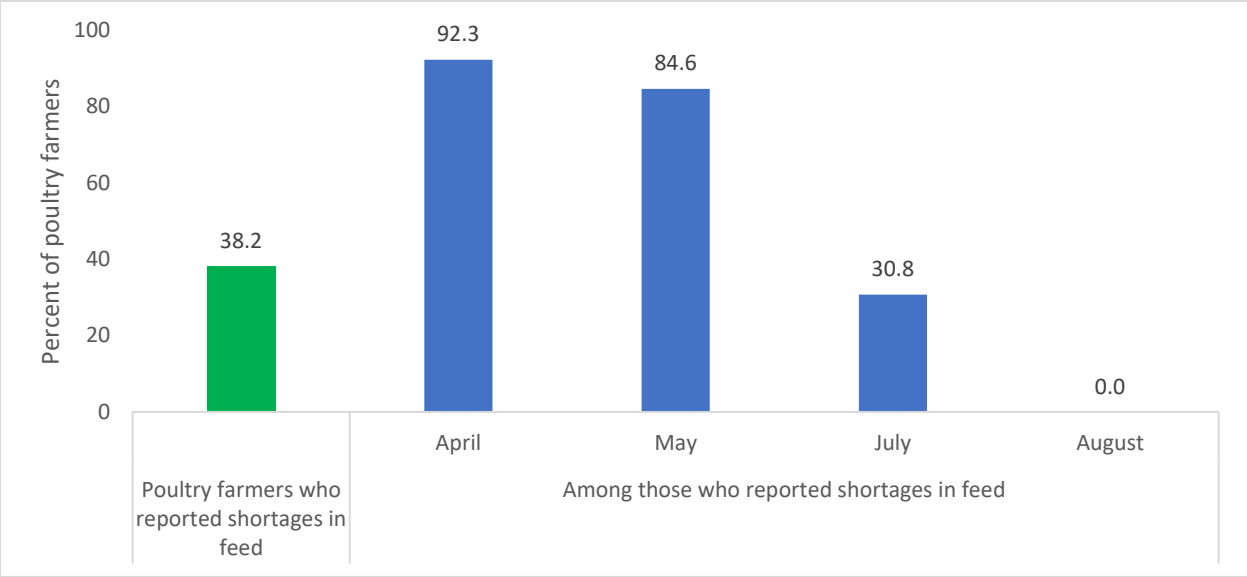
Figure 6.15 Percentage of poultry farmers who reported market shortages in inputs (April-August 2020), by input



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 6.16 shows that among the 38.2 percent of poultry farmers who reported market shortages in feed, these market shortages were concentrated in the immediate months following the pandemic. Nearly all poultry farmers who reported market shortages in feed indicated that this took place in April (92.3 percent) and May (84.6 percent), which dropped to less than one-third (30.8 percent) in July, and was resolved completely by August 2020.

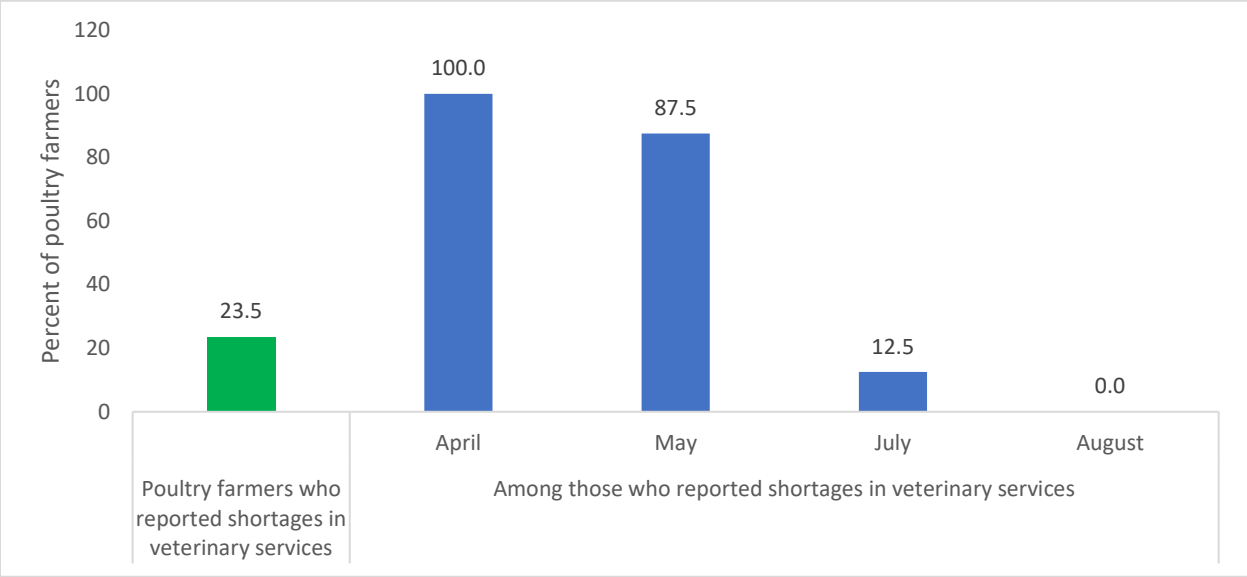
Figure 6.16 Percentage of poultry farmers who reported market shortage in feed (April-August 2020)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 6.17 shows the proportion of poultry farmers who reported interrupted veterinary services during the months following the coronavirus outbreak. All farmers who reported market shortages in veterinary services reported that this was an issue in April, and 87.5 percent of poultry farmers in May. Veterinary services were restored for a large proportion of poultry farmers by July 2020, and no farmers experienced market shortages of these services in August 2020.

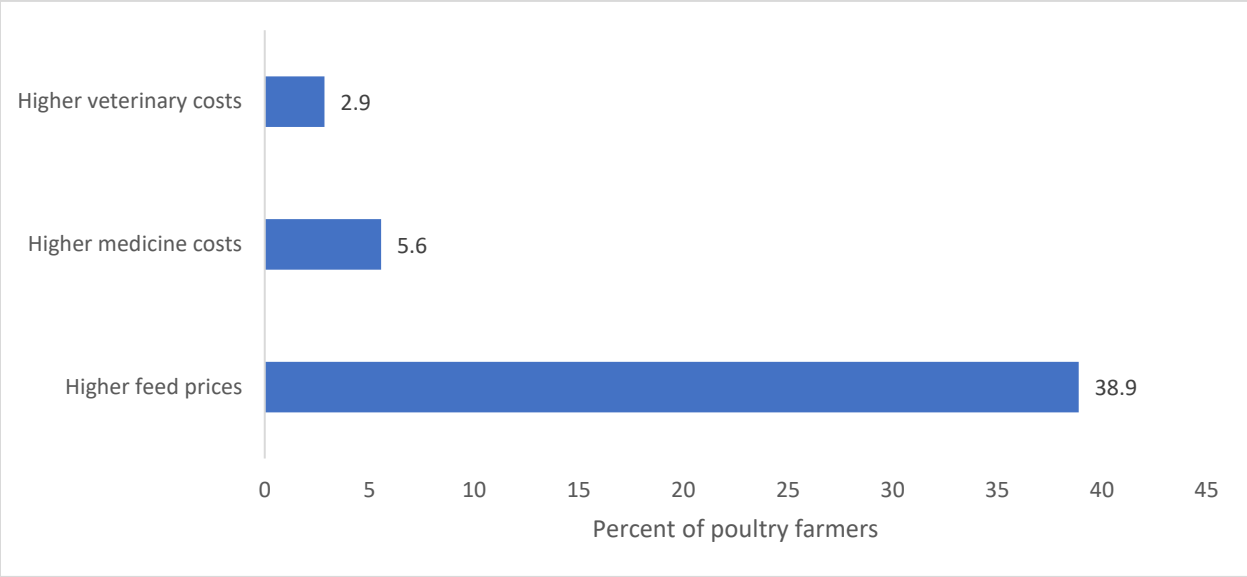
Figure 6.17 Percent of poultry farmers who reported market shortages in veterinary services (April-August 2020)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Poultry farmers in the ZOI reported which agricultural input prices increased compared with last year (**Figure 6.18**). Overall, around two-fifths of poultry farmers (38.9 percent) reported higher feed prices, whereas a much small proportion reported higher medicine prices (5.6 percent) and veterinary costs (2.9 percent).

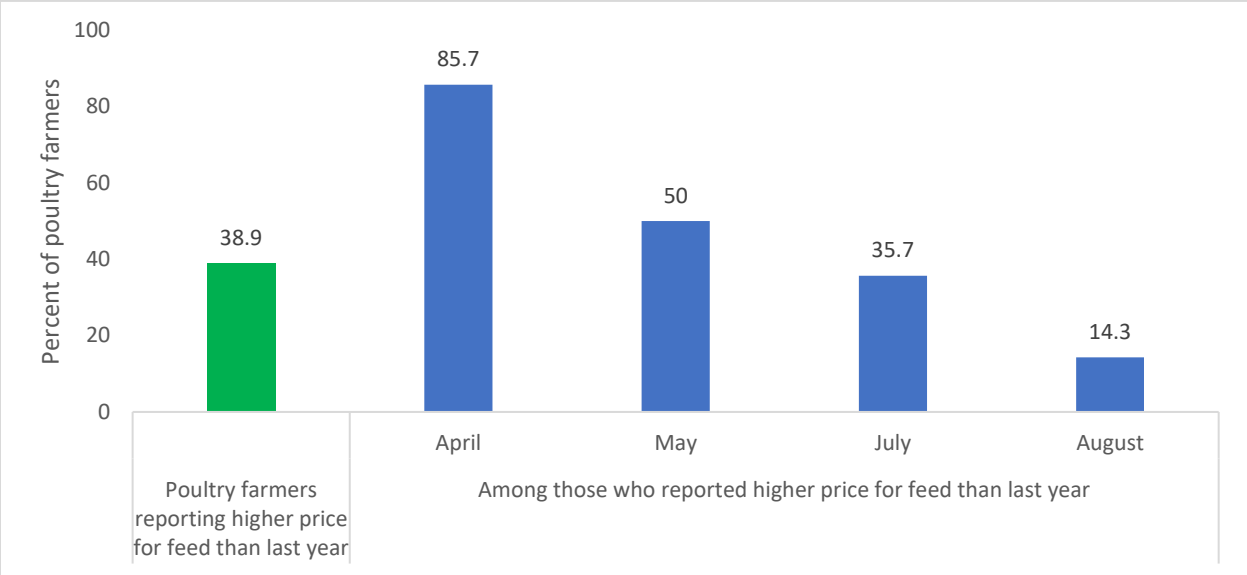
Figure 6.18 Percent of poultry farmers who reported higher prices for various agricultural inputs compared with last year (April-August 2020)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

As mentioned above, compared with last year, 38.9 percent of poultry farmers reported higher feed prices (**Figure 6.19**). Although the differences between 2019 and 2020 prices were highest in April, 14.3 percent of poultry farmers (adversely affected by higher feed prices this year) reported that feed prices were still higher in August 2020 than August 2019.

Figure 6.19 Percent of poultry farmers who reported higher feed prices than last year (April-August 2020)

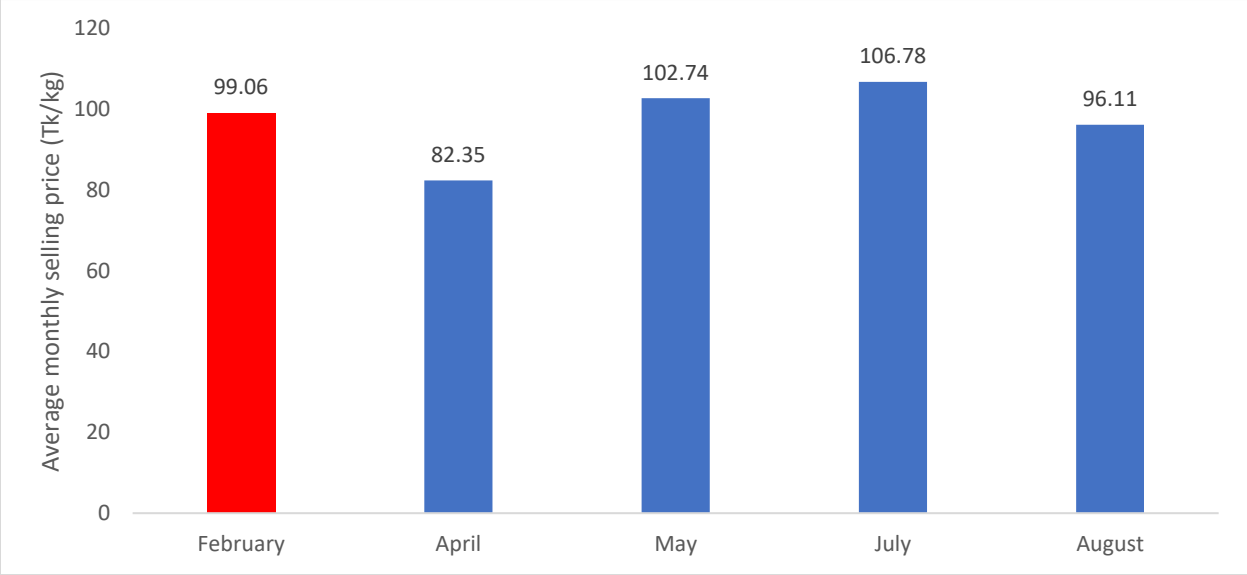


Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

6.3.2 Broiler Farmers

Figure 6.20 shows the variations in selling price of broiler chicken between February and August 2020. Although there was a slight price decline reported between February (pre-COVID month) and April 2020, the selling price recovered in May and July 2020 to Tk 103/kg and Tk 107/kg, respectively. In August, the reported price of broiler chicken drops to around Tk 96/kg – this could be an artefact of the post-Eid ul Adha. There is usually a decrease in the demand for chicken meat in this period because of higher-than average consumption of beef and other red meat obtained from the Eid sacrifice.

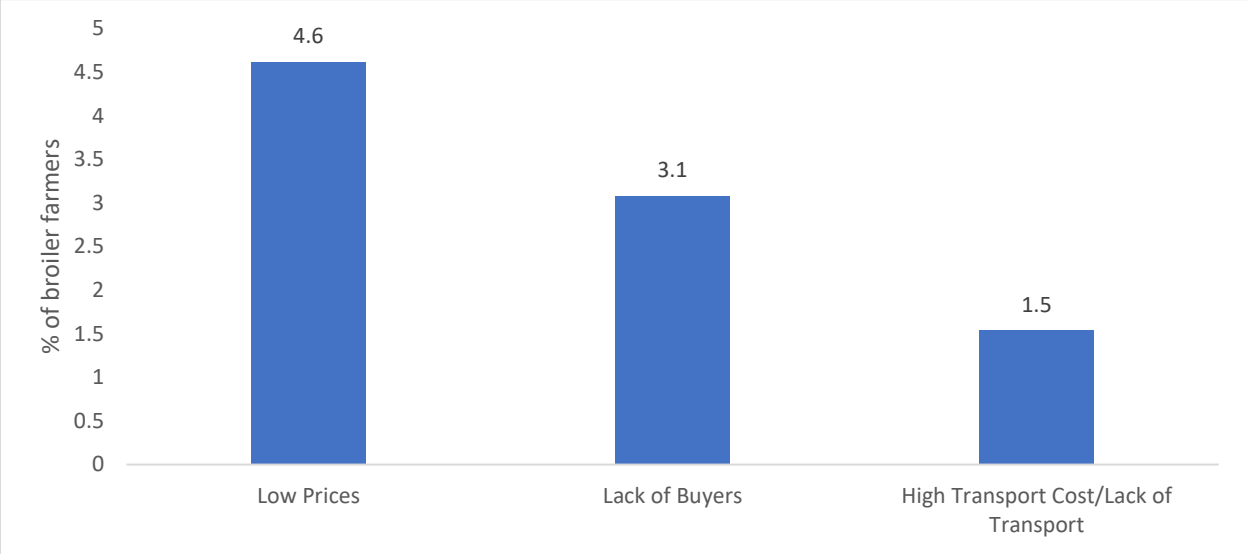
Figure 6.20 Average monthly selling price of broiler chicken (February-August 2020)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Between April and August 2020, 4.6 percent of broiler farmers in the ZOI reported that they could not sell for at least one month due to low prices, followed by 3.1 percent who reported a lack of buyers being an issue. Transport-related issues affected a minor percentage of broiler famers (1.5 percent) (**Figure 6.21**).

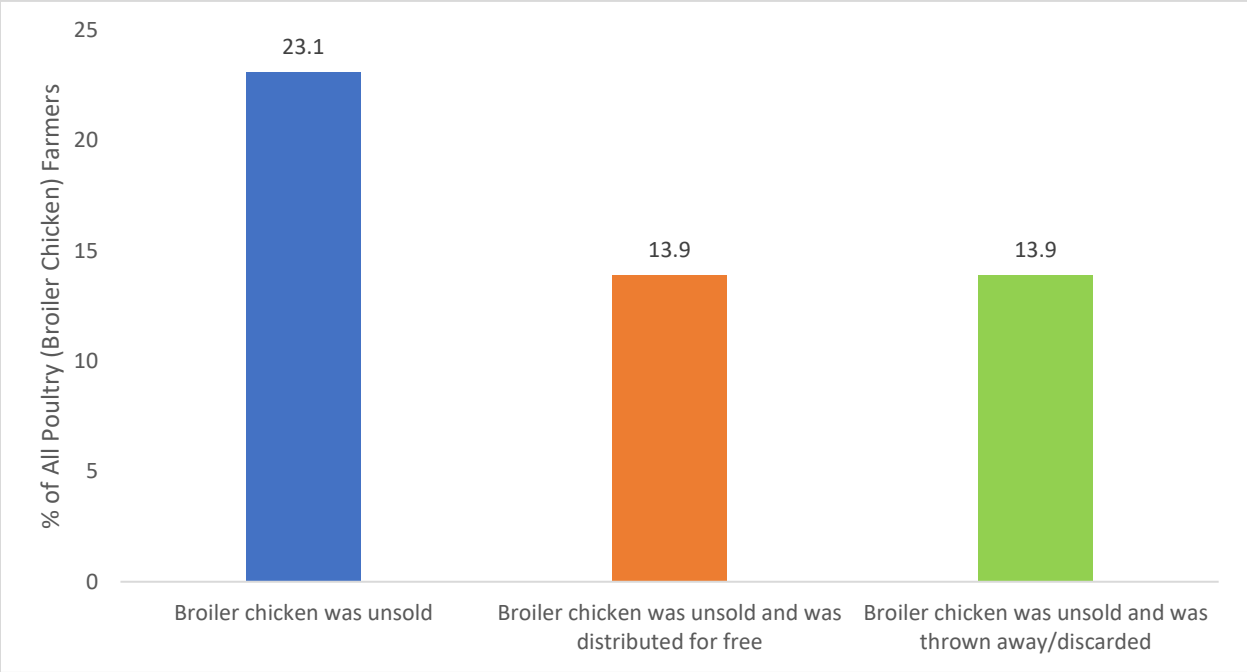
Figure 6.21 Percent of broiler farmers (i.e., who sold at least once this year) who were not able to sell at least during one month between April-August 2020 due to COVID-related issues



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 6.22 shows that 23.1 percent of all broiler chicken farmers were unable to sell their broiler chicken at least once during April-August 2020. 13.9 percent of the poultry farmers (who were unable to sell their broiler chicken at least once during April-August 2020) distributed unsold chickens for free, and 13.9 percent of poultry farmers (who were unable to sell their broiler chicken at least once during April-August 2020) discarded unsold broiler chickens.

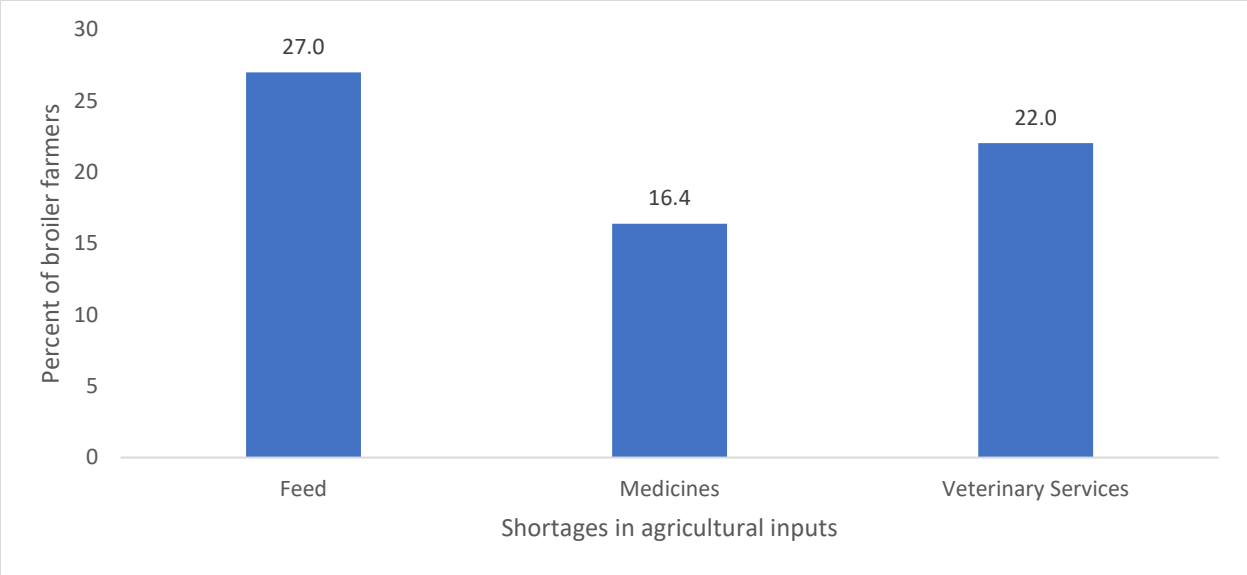
Figure 6.22 Broiler chicken was unsold at least once during April-August 2020 (all poultry farmers)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Surveyed broiler chicken farmers reported market shortages in critical agricultural inputs (**Figure 6.23**). The highest proportion of farmers (27.0 percent) reported market shortages in feed, followed by veterinary services (22.0 percent), and then medicines (16.4 percent).

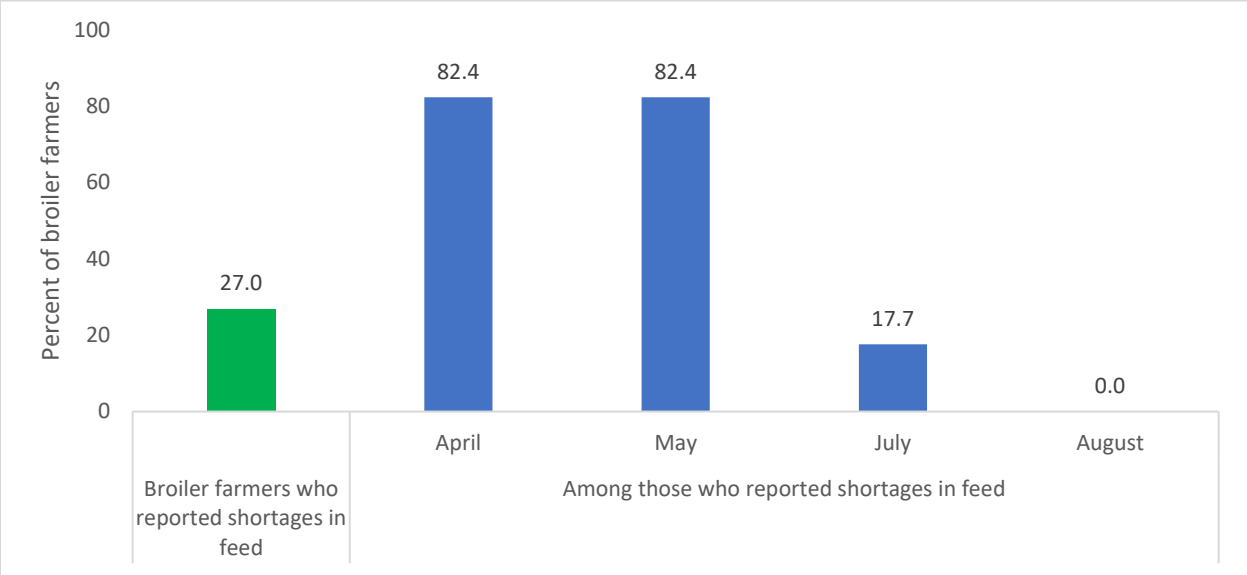
Figure 6.23 Percent of broiler farmers who faced market shortages in agricultural inputs (April-August 2020)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

According to **Figure 6.24**, the majority of market shortages in feed were reported in April and May 2020. These reports drastically reduced by July, with only 17.7 percent of farmers reporting market shortages in feed. By August 2020, no broiler farmers in the ZOI reported facing market shortages in feed.

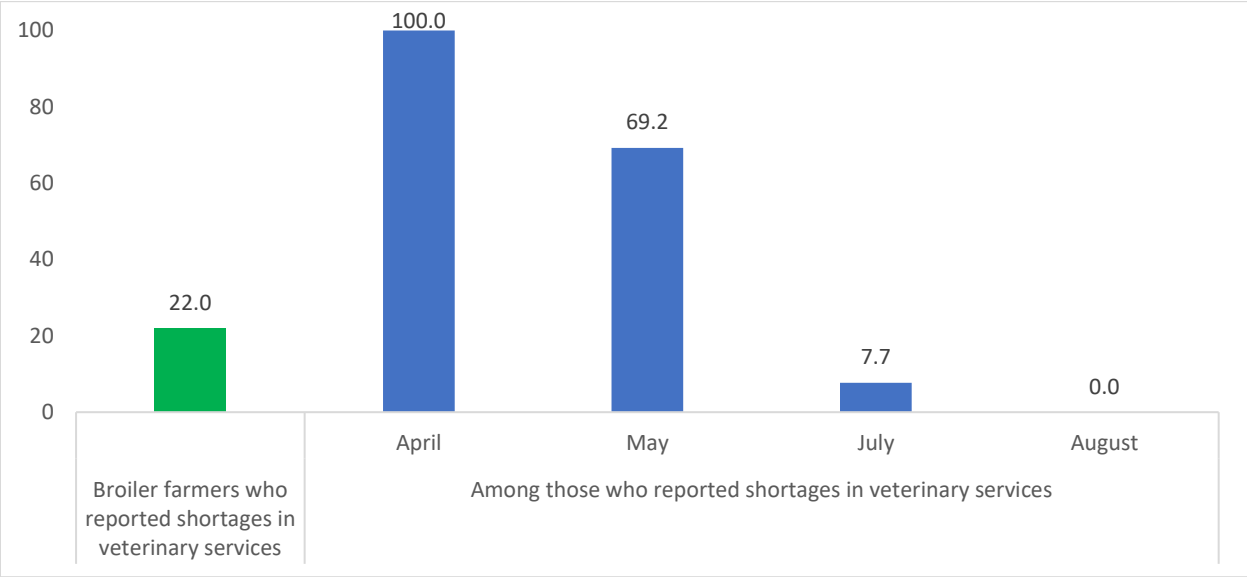
Figure 6.24 Percent of broiler farmers who reported market shortages in feed, by month



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Among surveyed broiler farmers, 22.0 percent reported market shortages in veterinary services (**Figure 6.25**). All of the 22.0 percent of broiler farmers claimed that this was an issue in April. By July, only 7.7 percent of broiler farmers faced market shortages in veterinary services, and by August 2020, this issue was eliminated.

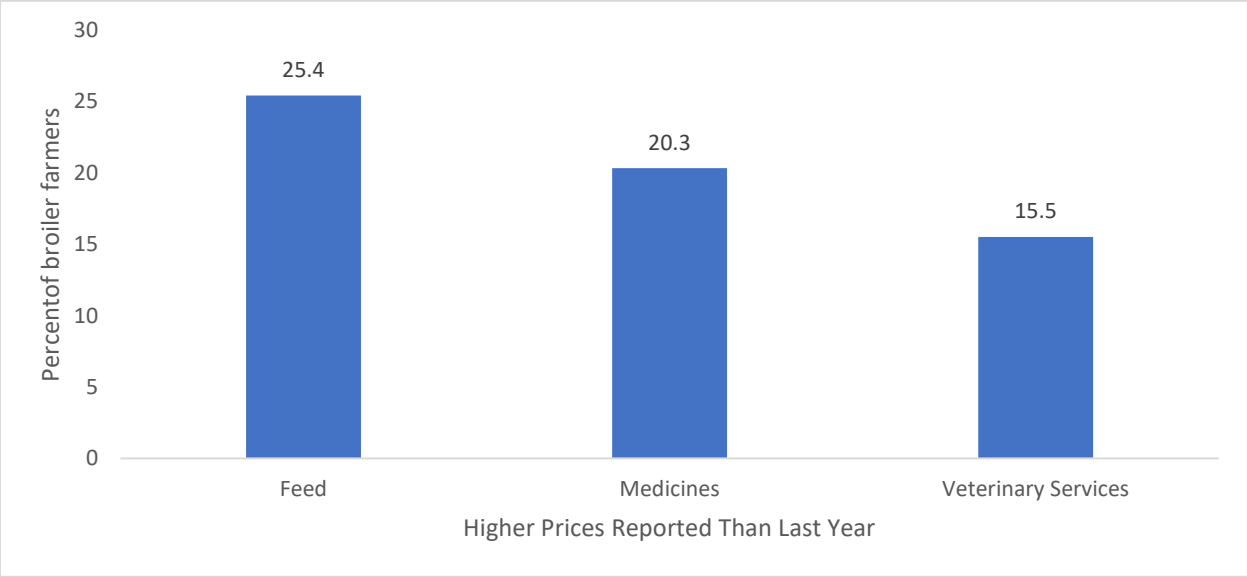
Figure 6.25 Percent of broiler farmers who faced market shortages in veterinary services (April-August 2020)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 6.26 shows the price changes for key agricultural inputs compared with last year, as reported by broiler farmers in the ZOI.

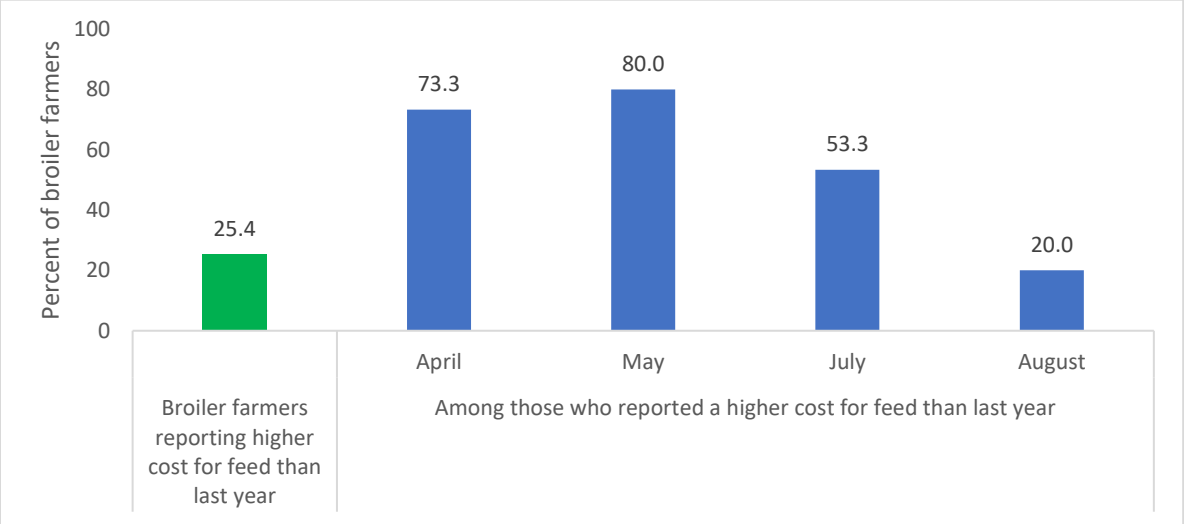
Figure 6.26 Percent of broiler farmers who reported higher prices for various agricultural inputs than last year (April-August 2020)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 6.27 shows that one-quarter of broiler farmers noted higher feed prices than 2019. These price hikes were observed by 73.3 percent and 80.0 percent of broiler farmers in April and May 2020, respectively. By July 2020, around half (53.3 percent) of broiler farmers reported higher costs for feed, which was halved by August (20.0 percent). While there was progress in stabilizing prices for broiler feed in the months following the outbreak, a relatively large proportion of broiler farmers still faced higher prices (compared with last year) up to five months after the first cases of COVID-19 were detected in Bangladesh.

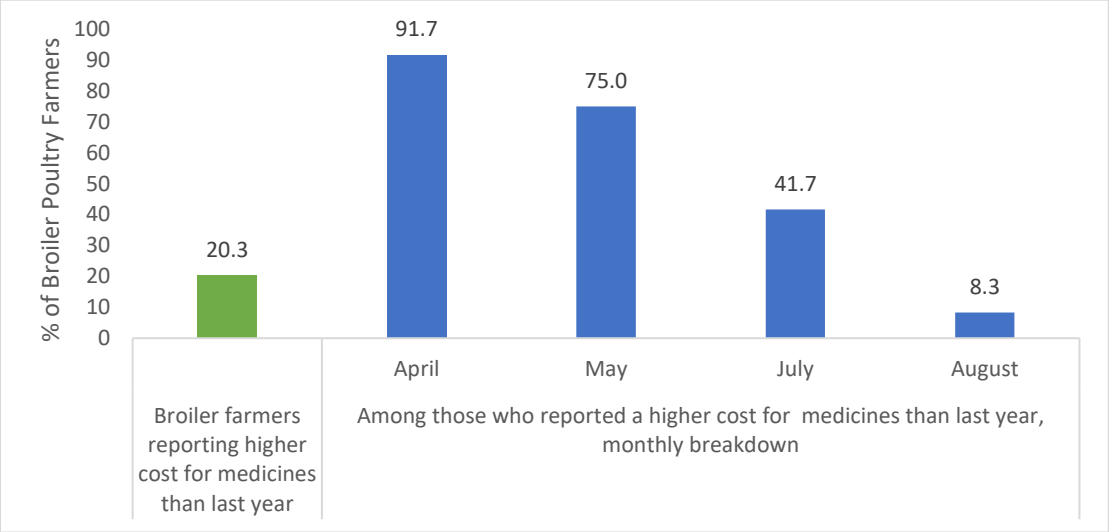
Figure 6.27 Percent of broiler farmers who reported higher costs for feed than last year (April-August 2020)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

Figure 6.28 highlights the price changes in medicine compared with 2019. One-fifth (20.3 percent) of broiler farmers indicated that medicine prices were higher in 2020 than in 2019. Farmers who reported higher costs for medicines followed the same pattern than those who reported higher costs for feed: the majority of farmers were affected by higher medicine costs in April and May, which gradually declined through August 2020. Again, this suggests that while there were strides in alleviating price disruptions with medicines used by broiler farmers, a large proportion of farmers in the ZOI remained affected months after the outbreak.

Figure 6.28 Percent of broiler farmers who reported higher costs for medicines than last year (April-August 2020)



Source: IFPRI-PRSSP Farmers' Phone Survey, August-September 2020

7 POLICY CONCLUSIONS

The COVID-19 pandemic has created a major health and economic crisis globally. In response, the Government of Bangladesh (GoB), along with other countries around the world, imposed policy measures to contain the spread of the virus. While these measures have been necessary and commendable, they have resulted in serious disruptions in the economy and livelihoods. IFPRI-PRSSP designed and conducted a telephone survey to assess the effects of the disruptions induced by COVID-19 on farmers in the Feed the Future ZOI. The policy conclusions in this section are drawn from the phone survey findings to guide USAID's programmatic decisions.

Access to Credit

Expanded access to finance for farmers in need of capital is essential for promoting adoption of modern agricultural technology, and hence, increasing agricultural productivity amid the COVID-19 crisis. Access to credit can also help farmers prevent stress sales of productive assets at low prices.

In response to COVID-19-induced crisis, the GoB announced a massive stimulus package, which includes loans to farmers at only 4 percent interest rate. However, the phone survey results reveal that, although there was widespread knowledge among surveyed farmers in the ZOI about this low-interest loan, very few (5 percent) applied and even fewer (less than 1 percent) received the loan. Many farmers did not know how to apply, while many others did not apply out of fear of being rejected and anticipated transaction costs.

Enabling farmers, particularly smallholder farmers, to access low-interest loans from the stimulus package is critical. Efforts to ensure this access could include establishing a performance monitoring system for the effective disbursement of these loans. Since the GoB has made the provision for these loans, the Implementation, Monitoring, and Evaluation Division (IMED) under the Ministry of Planning may monitor loan disbursements, particularly to smallholder farmers. Moreover, the feasibility of loan disbursement to marginal and smallholder farmers through Palli Karma Sahayak Foundation (PKSF), a government apex funding agency for non-governmental organizations (NGO), could be explored. PKSF has experience with providing loans to smallholder farmers by moving from weekly loan repayments to lump-sum repayments after crop harvest. Formal lending agencies such as banks may consider involving NGOs for extending loans to smallholder farmers because NGOs tend to have the bandwidth and networks in more remote areas to identify and support needy farmers who could benefit from access to finance.

Rice Farming

Rice farmers surveyed in the Feed the Future ZOI reported that labor shortages were one of the main problems that they faced since the pandemic started. One-fifth of the surveyed boro rice farmers and 14 percent of aus rice farmers in the ZOI faced a labor shortage, most likely due to COVID-19-related disruptions. A decrease in the supply of agricultural labor increased agricultural labor wages. Among

boro farmers who hired out-of-district labor for paddy harvesting in 2019, 42 percent reported that agricultural labor from other districts was unavailable this year, while another 40 percent hired less of this type of labor compared with last year.

Rural agricultural labor is no longer abundant in Bangladesh. Historically, real agricultural wages (adjusted for inflation) in Bangladesh either declined or remained stable. However, real rural wages have increased dramatically since 2005. COVID-19-related disruptions led to further increase in agricultural labor wages, which, in turn, has significantly reduced farmers' profitability. Policies should focus on ways to improve productivity in the wake of rising labor costs. Promoting farm mechanization can ease farmers' burden.

The GoB already provides a high subsidy for buying agricultural machineries. Besides offering subsidy to farmers, the GoB could target these subsidies to rural youth groups to buy machineries. The GoB, NGOs, and USAID could mobilize the rural youth for the formation of community service provider groups, who can buy combined harvesters, reapers, and tractors at subsidized prices, and provide the services to farmers for land preparation and crop harvesting for a service charge that includes their profit. The GoB can provide credit at low interest rates to these rural youth groups, and USAID may consider providing appropriate vocational training to them for repair and maintenance of farm machineries. This will generate employment and income to a large segment of the rural population, the youth, who do not want to be involved in agriculture directly and could stand to benefit amid COVID-19.

Farming of Non-Rice Crops

IFPRI interviewed banana, brinjal, flower, and jute farmers from the ZOI to assess the effects of the pandemic on their production and marketing practices. COVID-19-induced supply disruptions caused shortages in agricultural inputs—namely, seed, fertilizer, and pesticide. The shortages were prevalent among non-rice crop farmers across the different crops, particularly in April and May—the immediate months after the COVID-19 outbreak. Scarcity in agricultural inputs increased their prices. Besides these inputs, about one-fifth of jute farmers reported labor shortages.

Although the magnitude of shortages in agricultural inputs and increased prices of inputs gradually reduced, the situation prevailed—albeit at a lesser degree—until August, the last month covered by the survey. Monitoring the input supply situation and farmers' access to inputs and input prices is critical for informing policy decisions to avoid crisis. A second rapid phone survey can be conducted to assess the situation of availability of inputs. If the survey shows a prolonged shortage of inputs for agricultural production, then policy measures to ensure adequate supplies of inputs, such as seeds, fertilizers, and agro-chemicals would be required. Expanding the government stimulus package to support agro-input dealers can be considered.

Brinjal (eggplant) is a is a high-value crop widely grown and consumed in Bangladesh. Brinjal ranks third after potato and rice among crops in the country in terms of quantity consumed (Ahmed, Hoddinott, Tanger, and Perlman 2019). Similar with other crops, brinjal farmers were affected by agricultural input

shortages and, in turn, higher agricultural input prices, with 15 percent of surveyed farmers reporting higher pesticide prices, 14 percent for seed, and 11 percent for fertilizer between April and August 2020.

Brinjal is highly vulnerable to the fruit and shoot borer pest, and farmers spray the crop heavily with pesticides. Farmers' spending on pesticides reduces their income; and increased pesticide use heightens their risk of contracting pesticide-related illnesses. Developing modern, pest-resistant crop varieties can help tackle these issues. Agricultural biotechnologies such as genetically engineered Bt brinjal hold promise.

IFPRI-PRSSP's recent Bt brinjal impact assessment provides scientific evidence of the benefits of Bt brinjal cultivation in Bangladesh. The study found that Bt brinjal reduced fruit and shoot borer infestation by 95 percent, pesticide use by 39 percent, and environmental toxicity of pesticides by 51 percent, and increased brinjal yields by 42 percent and farmers' net profits by Tk 33,827 (approximately US$400) per hectare (Ahmed et al. 2019). Bt brinjal is a relatively new technology; therefore, it will require improved agricultural extension services to help farmers adopt the most efficient techniques for Bt brinjal production and marketing.

Flower cultivation in the ZOI was hit the hardest by the COVID-19-related disruptions, mainly due to demand-side issues. The most popular type of flower crop grown by surveyed farmers is *Rajanigandha* (tuberose) flower, followed by *Gada* (marigold) flower in the ZOI. Over half of these surveyed flower farmers could not sell for at least a month due to a lack of buyers.

An IFPRI-PRSSP study shows that flowers are the most profitable crop among 12 target crops in the Feed the Future ZOI (Ahmed et al. 2015). Expanding commercial cultivation of flowers also has a high potential for generating rural employment because it is a highly labor-intensive crop. Therefore, policies to enable rapid expansion of flower production for domestic as well as export markets can have high payoffs in terms generating employment and income in rural Bangladesh.

Year-to-year price fluctuations are much larger for non-rice crops than for rice, indicating relatively high levels of market-induced risks for production of non-rice crops. High-value crops, such as brinjal and other vegetables, fruits, and flowers, have thin domestic markets owing to relatively low levels of demand for them due to widespread poverty and inadequate purchasing power. An increase in production causes a sharp decline in market prices (Ahmed and Ghostlaw 2019). One option is contract farming, which can protect farmers from the price risks of producing high-value crop and non-crop agricultural products such livestock, dairy and fish. Under this arrangement, the farmer provides agreed quantities of an agricultural product to an agribusiness firm, based on the quality standards and delivery requirements of the firm, usually at a price negotiated and established in advance. Agribusiness firms may also agree to support the farmers through input supply, credit, extension advice, and transporting produce to their premises (Eaton and Shepherd 2001).

Non-Crop Agriculture

IFPRI's farmers' phone survey interviewed dairy, fish, and poultry farmers in the ZOI. Dairy farmers were hard-hit by the COVID-19 lockdown, particularly by a lack of buyers. The average selling price of milk in February 2020—before the COVID-19 lockdown—was Tk 44.76/liter, which declined in the immediate months following the outbreak due to a lack of demand. During this time, half of the dairy farmers reported milk went unsold and over one-third of the farmers distributed milk for free. However, as the economy began to recover, the average selling price of milk rose above the pre-pandemic rate by August 2020. Dairy farmers also experienced acute shortages in cattle feed, veterinary services, and medicines for cattle particularly in April and May 2020. Shortages in veterinary services and medicines for cattle are greatly concerning given that an inability to treat ailments or injury can result in illness or death, which, in turn, presents long-term, debilitating consequences on the income-earning potential of these ZOI households.

The farmers' phone survey findings present a similarly concerning composite of fish farmers in ZOI in the immediate months following the COVID-19 pandemic. Over one-third of surveyed fish farmers in the ZOI reported shortages in fingerlings.

For the surveyed poultry farmers, the average monthly selling price of eggs dipped in April and May 2020, but rebounded by July 2020 to above the pre-pandemic monthly price of eggs. Although egg farmers appear to be relatively less affected than dairy farmers, 17 percent of ZOI egg farmers had eggs go unsold or were distributed for free between April and August 2020. An alarmingly high percentage of poultry farmers faced shortages in critical inputs, including poultry feed (38 percent), veterinary services (24 percent), and medicine (15 percent), particularly in the immediate months following the outbreak.

Protecting and stimulating the production and marketing of high-value crops (such as vegetables, fruits, and flowers) and non-crop agricultural products, including meat, milk, eggs, and fish, is critical during the COVID-19 outbreak. Unlike cereals, these products face special problems related to perishability, which increases the risks of marketing. Strategies to minimize farmers' risks and losses are essential during and beyond the COVID-19 pandemic. For example, providing technical assistance to strengthen business models, such as through the use of online marketing and improving packaging to lengthen products' shelf life, is a promising option. Ensuring access to institutional credit for farmers and market intermediaries at a low-interest rate can safeguard the producers in the short-term. Additionally, expanding cold storage beyond potatoes and promoting low-temperature transportation facilities, improving the milk collection system and establishing more chilling plants for milk would be beneficial for farmers in the medium- and longer-term. Altogether, these strategies can help farmers to profit and consumers to benefit from the availability of safe, healthy products, particularly during this unprecedented shock.

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