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# Qualitative assessment of COVID-19 impacts on aquatic food value chains in Bangladesh (Round 3)

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## About FISH

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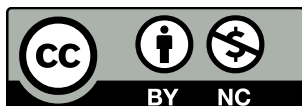
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## Executive Summary

Aquatic food value chains make up a large part of Bangladesh's food system. In this report, we explore how actors in Bangladesh's aquatic food supply chain have been affected by COVID-19. We conducted qualitative telephone interviews to elicit participants' perceptions and experiences of the impacts of COVID-19 on different segments of the aquatic food supply chain. The work was designed to complement and add context to quantitative surveys of aquatic food supply chain actors that we conducted throughout 2020 and 2021.

Two rounds of interviews were conducted in May and September 2020, covering the months of March-April and May-August, respectively to capture changes taking place over the progression of the pandemic. Forty-four participants were purposively sampled in the first round of interviews, and an additional 19 respondents were recruited for the second round for a total 63 respondents. [The detailed results of the first two rounds can be found here.](#)

This report covers a third round of interviews conducted in July 2021 inquiring about respondents' experience of the pandemic between January and June 2021, and is divided into the following sections: (1) impacts on input suppliers; (2) impacts on producers, (3) impacts on retailers and wholesalers (4) impacts on consumers; and (5) experiences and perceptions of aid and assistance. Each section is further subdivided into findings from the first and second rounds of interviews.

### Key findings

- Restrictions on transnational transportation limited international trade, which decreased availability and increased prices of materials for input supplies (e.g. feed mills, hatcheries, and fry traders).
- Farmers generally reduced production volumes for two main reasons: (1) unrecovered financial losses during 2020 impacted on producers' ability to purchase inputs in 2021, and (2) farmers wanted to minimize the perceived risk of continued reduction in demand from retailers, wholesalers, and consumers. As a result, farmers purchased less inputs, negatively impacting on input suppliers through reduced sales.
- Processors experienced some recovery in 2021 compared to 2020 due to increased activity in the markets; however, their income had not yet returned to pre-pandemic levels due to the continued lower prices and volumes of fish.
- Retailers and wholesalers greatly reduced their stock due to reduced supply and decreased demand, as restaurants, tourist venues, and large social events like weddings were closed or cancelled.
- Input suppliers and producers adapted and changed their behavior in response to the conditions of the pandemic. For example, many switched to mobile applications for marketing and payment transfers. Some actors accepted delayed payment on credit.
- Input suppliers and producers for the export-oriented shrimp value-chain were less-affected by the pandemic than actors in the local and finfish sectors.
- Higher-income consumers were able to afford nutritious foods, leading to increased consumption of meats, fish, and fruit to support their immunity during the pandemic; however, lower-income consumers reported eating less meats, fish and fruit due to financial difficulties. Instead, lower-income consumers consumed more eggs, vegetables, and lentils.
- Higher-income consumers transitioned to using mobile applications for purchasing food in order to reduce travel and practice social distancing as a preventative measure; however, lower-income consumers continued to rely on markets for food.

- Subsistence farming increased food security and was an important resilience strategy: fish farmers ate their own fish and some consumers grew vegetables in their gardens.
- Respondents believed that government and NGO aid was insufficient. They believed that (1) aid and loan applications were too complex, (2) the interest rates on loans were too high, and (3) there was inequitable access to loans and aid.
- Children's education was impacted negatively by the shift from face-to-face learning to online learning, where students were less engaged with their studies when learning from home.

# 1. Introduction

The COVID-19 pandemic has disrupted food systems globally, resulting in significant impacts on economic and food security. In Bangladesh, aquatic food value chains make up a large part of the country's food system. WorldFish is conducting longitudinal phone surveys to analyze the impacts of COVID-19 on aquatic food value chains, but these do not capture nuanced details of the context in which observed trends are embedded. To this end, this longitudinal qualitative study aims to explore in greater depth the pathways by which aquatic food supply chain actors in Bangladesh are affected by COVID-19. Because the roles of men and women in Bangladesh differ (e.g. women are highly involved in the processing sector, wholesalers are exclusively men), this work aimed to examine how the impacts of COVID-19 compared between men and women.

## 2. Methods

Two rounds of telephone interviews were conducted in May 2020 and September 2020 (Mamun *et al* 2021). A list of possible participants that met the study eligibility criteria was generated based on the prior contacts of the research team. Participants from this list were then recruited over the phone and interviewed based on their willingness to participate. In all rounds, participants were purposively sampled to capture diversity in geographic location, actor type, actor size, and gender, covering all eight divisions of Bangladesh and a variety of actor types. The research team interviewed 44 participants in the first round and 63 participants in the second round. In the third phase, about 100 participants were targeted and 96 were interviewed (Table 1 and Table 2). Particular effort was made to interview more women in order to understand how the impacts of COVID-19 on men compared to those on women. Attrition was due to participants' frustrations over the conditions and effects of the pandemic and disinterest in discussing the situation.

Table 1 Participant characteristics by value-chain segment

Actor Type	Number of Respondents		
	Round 1 (March-April 2020)	Round 2 (May-August 2020)	Round 3 (July-August 2021)
Hatchery/Nursery	7 (16%)	7 (11%)	14 (15%)
Feed Mill	2 (5%)	2 (3%)	0 (0%)
Feed & Pharmaceuticals retailer	6 (14%)	6 (10%)	12 (13%)
Farmer	7 (16%)	10 (16%)	26 (27%)
Fisher	4 (9%)	6 (10%)	10 (10%)
Fish retailer & wholesaler	3 (7%)	3 (5%)	8 (8%)
Fishing laborer*	3 (7%)	4 (6%)	4 (4%)
Fish processor	5 (11%)	11 (17%)	14 (15%)
Fry trader ( <i>patilwala</i> )	3 (7%)	3 (5%)	2 (2%)
Driver/transport worker	3 (7%)	3 (5%)	1 (1%)
Consumers	1 (2%)	8 (13%)	2 (2%)
Government/Consultants	-	-	3 (3%)

\* Members of netting teams employed to harvest fishponds and workers on fishing boats.

Table 2 Participant characteristics by division and gender

Division	Number of Respondents		
	Round 1 (March-April 2020)	Round 2 (May-August 2020)	Round 3 (July-August 2021)
Dhaka	4 (9%)	7 (11%)	6 (6%)
Chattogram	21 (48%)	35 (56%)	40 (42%)
Khulna	10 (23%)	12 (19%)	23 (24%)
Barisal	1 (2%)	1 (2%)	4 (4%)
Mymensingh	4 (9%)	4 (6%)	3 (3%)
Rajshashi	1 (2%)	1 (2%)	5 (5%)
Rangpur	1 (2%)	1 (2%)	10 (10%)
Sylhet	2 (5%)	2 (3%)	5 (5%)
<b>Gender</b>			
Male	39 (89%)	40 (63%)	46 (48%)
Female	5 (11%)	23 (37%)	50 (52%)

Round 1 interviews focused on COVID-19 impacts from March to April 2020 (during the country-wide lockdown), while Round 2 interviews focused on COVID-19 impacts from May to August 2020 (following the lift of the country-wide lockdown). A semi-structured interview guide was designed for Round 1, which consisted of ten sets of open-ended questions on how COVID-19 had impacted participants' occupations, businesses or livelihoods, and their adaptations to these changes, impacts on their food consumption, and the nature of any assistance or support received. Round 2 interviews included additional questions comparing the lockdown, post-lockdown, and previous year periods. The current round (round 3) consisted of 12 open-ended questions investigating the impact of COVID-19 on the food system, adaptive mechanisms across the value-chain, and children's education. Consent was obtained from each participant prior to interview.

### 3. Results

Our results are organized by actor type across the value chain, including (1) impacts on input suppliers, (2) impacts on producers, (3) impacts on retailers and wholesalers, (4) impacts on consumers, and (5) experiences and perceptions of aid and assistance. Input suppliers include hatcheries, feed suppliers, medicine/pharmaceutical suppliers, and seed traders (*patilwala*). Producers include farmers, fishers, fish processors, laborers, and transport workers. For each node across the value-chain, we compare the responses by gender.

For suppliers, producers, and retailers/wholesalers, we present analysis of perceived supply side shocks (changes in input prices, availability and accessibility); demand side shocks (changes in demand for marketed products, sales prices and volume); and responses (business adaptations and/or coping mechanisms, including changes in quantities of production).

### 3.1 Input suppliers

#### 3.1.1 Increases in input costs, availability and accessibility

Hatcheries, fry traders, feed mills, feed and medicine sellers all reported an increase in the price of inputs, and a decrease in availability and accessibility of inputs. While some respondents experienced minor losses due to bad weather, all major losses were attributed to the COVID-19 pandemic. Due to the COVID-19 pandemic, transportation and movement to and from India was severely limited and, as a result, feed ingredients (e.g. mustard oil cake, dry fish) that are normally imported from India became less available in the market. As a result, the price increased in the local market. Also as a result of movement restrictions, the supply of imported pituitary gland (PG), a hormone used for breeding carp, was low while the demand remaining high. As a result, the price of PG tripled from 5000 BDT per bottle in 2019 to 16000 BDT per bottle in 2020 and 14000 BDT per bottle in 2021.

“Covid-19 destroy my all business. In one side, feed selling volume has decreased and another site the fish price has decreased 25-30 BDT per Kg. As a result, I faced huge loss in my *gher* business. So far I have to sell land to mitigate the loss.”

*Male feed seller, Khulna, 2021*

“People are suffering both mentally, and economically. Some people have money in their pocket however Covid take away mental peace. Hope, everything is going to be ok very soon so that people can live happily as before.”

*Male driver, Chittagong, 2021*

Feed producers also reported increased prices of locally-sourced raw materials. For example, the price of mono-sodium glutamate increased from 43 BDT/kg in 2019 to 45 BDT/kg in 2020 and 50 BDT/kg in 2021. Similarly, the price of vitamins increased from 500 BDT/kg in 2019 to 530-540 BDT/kg in 2020 and 550 BDT/kg in 2021. The study found that, the price of all feed ingredients increased by about 2-5 BDT/kg. Moreover, the price of some feed ingredients has increased 100-125 BDT per sac. A few respondents believed that the increasing price of inputs was due to high transportation costs attributed by countrywide

lockdown measures. Indeed, the transportation cost was higher in 2021 (20-25%) compared to 2020 (10%) and 2019 (20%). Increased transportation costs of materials resulted in higher prices of feeds: the price of both feed and medicine was higher in 2021 compared to 2020 and 2019.

Prawn post-larvae (PL) traders similarly reported increased prices and decreased availability of PL. Hatchery-produced prawn PL was lower in 2020 and 2021 compared to 2019. Furthermore, Indian PL (prawn; imported PL) was not available in time for the normal stocking season in 2021. Because traders were unable to import PL due to the transboundary movement restrictions, the availability of Indian PL (prawn)

“This year the business was quite good compare to the previous year. The government initiative for these sector actually bring the change and helps the business to run successfully.”

*Male shrimp hatchery owner, Cox's Bazar, 2021*



decreased by 40% in volume in 2020 and 50% in 2021. This led to higher prices of prawn PL in 2021 compared to 2020 and 2019. Pre-pandemic, most of the shrimp hatcheries at Cox's Bazar transported their shrimp PL to Jashore, Khulna, Satkhira, Bagerhat via air-cargo. In general, 6 air cargo planes are used to transport PL; however, only 4 air-cargo planes were used in 2021. As a result, it was quite difficult for hatcheries to supply PL on time for the stocking season.

Government-mandated restrictions on operating hours reduced the average number of business hours and resulted in lower total sales. Most of the respondents could only open their shop for three to four hours each day within the strict lockdown periods.

### 3.1.2 Decline in seed and feed demand, sales volumes and prices

During the COVID-19 pandemic, hatchery businesses were affected by reduced sales volumes, decreased sales price of fry and hatchlings, and increased price of inputs. Hatchery owners reported that the demand for finfish fry was reduced by 30-40% in 2021 from 2020, as fish farmers struggled with financial losses and limited capital as a result of the pandemic. One respondent said the number of tilapia fry sold was about 10 million fry in 2019, compared to only 4.5 million in 2020 and 2.5 million in 2021. Another respondent reported that the total number of fry sold was higher in 2019 (2.5 MT) than in 2020 (1.4MT) and in 2021 (1.6 MT). One hatchery owner reported that the sales volume decreased nearly 50% (from 600 kg hatchlings to 330 kg). He mentioned two reasons for this: firstly, farmers from the neighboring district were unable to travel to markets due to the government-mandated lockdown in April, which is the peak season for selling and stocking fry. Secondly, some nurseries did not purchase hatchlings because they were unable to sell fish from the previous year. Respondents reported that, as a result of decreased demand, the price of hatchlings decreased 20-25% in 2021. Pre-pandemic, the average price of hatchlings was 1,500 BDT per kg; however, it ranged between 800-1,000 BDT per kg in 2021.

Shrimp hatcheries were similarly affected. The sold volume of shrimp PLs from hatcheries decreased by about 20-25% in 2021. One hatchery owner said, Satkhira, Bagerhat and Khulna is the main market for the Shrimp PL of Cox's Bazar; however, these areas were highly affected by COVID-19 in 2021. Moreover, the price of shrimp PL also decreased 0.10-0.15 BDT per PL this year. In 2021, the price of shrimp PL ranged between 0.20-0.25 BDT per PL. One respondent noted that the average price of 100 shrimp PL in 2021 ranged from 35-40 BDT whereas in July 2020, it was only 20 BDT.

The sales in feed also decreased: the sale of feeds was lower in 2020 and 2021 (25% and 35% of the amount sold in 2019, respectively). The demand for feed was also reduced (30%) in 2021 compared to 2020 and 2019. The sale of tilapia feed was reduced by almost 50% in 2021 compared to 2020. One feed seller reported that, pre-pandemic, he sold on average 15-20 MT of fish feed (pellet and non-pellet combined) but in June 2021, the volume has decreased by nearly 60%. Feed sales decreased because business disruptions in 2020, such as decreased sales and income, had a cumulative effect on businesses in 2021. For example, in 2021, most of the farmers were unable to pay in cash due to huge financial losses in the previous cycle from the impacts of the pandemic.

### 3.1.3 Financial losses and lower production

Input suppliers suffered financial losses due to decreased demand and supply-chain disruptions during the COVID-19 pandemic, and in response, reduced production in 2021. The hatchery production of tilapia decreased significantly from 12 million fry in 2019 to 10 million in 2020 and 3 million in 2021. One hatchery respondent reported that the total seed production in 2021 dropped nearly 40% compared to the previous year. He added that they produced a total of 2000 kg of fish seed in 2021 compared to 3500 kg in 2020.

The sales and income of fry traders (*patilwala*) also decreased due to the low demand of fish for stocking. The average monthly income of fry traders was 12,000 BDT in 2019; however, due to the pandemic, their average monthly income was reduced to 6,000 BDT in 2020 but recovered slightly to 10,000 BDT in 2021.

Most of the respondents reduced the number of their permanent and temporary laborers due to lower production and profit, suggesting that both business owners' and employees' livelihoods were impacted by the dynamics of the pandemic.

#### 3.1.4 Differences in Gender

Both male and female input suppliers reported the same issues and experiences in regards to the impact of COVID-19. Compared to male suppliers, more female input suppliers received aid, but noted that this aid was gender-responsive rather than in response to the COVID-19 crisis. All respondents, except for three women, felt that the impacts of the COVID-19 pandemic were worse in 2021 compared to 2020. Most input suppliers believed that men were more affected by the pandemic; however, they also noted that women who work are also affected by the pandemic. This implies that the need to work and leave the home increased people's vulnerability.

### 3.2 Producers

#### 3.2.1 Farmers

Generally, farmers experienced continued financial hardship in 2021 as a result of the continued conditions of the pandemic and residual financial impacts from conditions in 2020 (both from floods and from the pandemic).

In 2021, fish farmers were impacted by increased feed price, lower sales price of fish and unavailability of transport options. Many farmers delayed stocking their ponds because (1) they wanted to better assess the market demand in the upcoming year, and (2) they did not have enough cash on hand to purchase fry, which were expensive due to reduced availability. As a result, some farmers were unable to sell their fish due to insufficient size.

Although farmers' expenses were higher, they received lower market prices: respondents reported that the market price of every fish species decreased by 10-15%. Smaller fish sizes may have contributed to lower prices. Pre-pandemic, large volumes of fish produced in southwest Bangladesh were mostly destined for markets in Dhaka, Chittagong, and Sylhet; however, as transportation in 2021 was unavailable, farmers were unable to transport fish to those markets, instead supplying local markets at a lower price point. For example, the price of hilsa fish decreased by 50-100 BDT per kilogram mainly due to restriction movement and high transportation cost. The hilsa from Chandpur was mainly distributed in Dhaka, Narayanganj, Savar and Gazipur. As transportation options were limited, hilsa was alternatively sold in local markets at a lower price.

*"The government takes some necessary step like lockdown which is necessary to control Covid-19 pandemic but honestly speaking it is not good for the poor people like us and our business. We heard that some people got some aid from the government but they are better-off than us. I know some people who are in very worst situation but they didn't get any aid from the government."*

*Male fisher, Noakhali, 2021*

Farmers continued to experience financial hardship into 2021. One farmer reported that although, in 2020, he was able to obtain commercial fish feed on credit, he was unable to repay the feed seller in full due to the continued impacts on sales. As such, he resorted to homemade feed with cheaper ingredients. Several farmers reported that they were forced to switch from commercial feed to homemade feed due to financial pressures.

Homestead producers, typically small-scale production often managed by the female head of house, felt that the situation in 2021 was worse or unchanged compared to 2020. One female producer reported that her income decreased by an additional 20% in 2021. Another female producer reported that because she adapted to sell eggs and dyke-vegetables, her livelihood did not change between 2020 and 2021.

Contrary to fin fish, the price of shrimp, prawns, hard shell and soft-shell mud crab increased in 2021. Respondents reported that the prices of export-oriented shrimp and prawns increased by about 50-100 BDT/kg and the mud crab price has increased almost 30-40%. One soft-shell mud crab farmer said, the hard-shell mud crab price also increased this year. Currently, he has to pay 400 BDT for per kg hard shell mud crab. But similar to finfish farmers, crustacean farmers also reported stocking lower volumes of hard-shell mud crab as a risk-prevention strategy.

All types of farmers were impacted by increased fish feed costs which they attributed to higher transportation costs. The transportation cost of feed was increased (20-25%) in 2021 compared to 2019 and 2020 as a result of decreased supply of imported raw materials, as mentioned in section 3.1.

### 3.2.2 Fishers

Similar to 2020, fishers reported that they were unable to source sufficient labor for fishing activities. Fishers continued to report reduced fishing activities due to movement restrictions and lockdown measures; however, in 2021 they also chose not to fish due to limited demand. Some fishers felt that the situation in 2021 was worse than in 2020, while others reported no change between the two years. One fisher reported that his income decreased by 60% due to the pandemic, and had to sell one of his boats to cover business and household expenses. Another indicated that his income halved with the onset of the pandemic.

Fishing laborers reported that while they were available and willing to work, they were unable to connect with fishers due to communication issues. As normal meeting places were closed due to lockdown restrictions, fishing laborers adapted by using phone calls to acquire fishing labor work. One respondent also sought alternative income-generating activities, such as fishing for fingerlings and temporary jobs. Another fishing laborer reported that his income increased in 2021 compared to 2020, but had not yet recovered to pre-pandemic levels: while this respondent earned 1500 BDT per month in 2019, he earned only 5000 BDT per month in 2020 and 8000 BDT per month in 2021.

### 3.2.3 Processors

All fish processors reported reduced income during the pandemic than in 2019; however, those in markets experienced some recovery in 2021. One 'fish cutter' estimated that he earned 30% less in 2020 than in 2019, but that his income increased by 15% in 2021 compared to 2020. This respondent also noted that the number of customers visiting markets had returned to pre-pandemic rates, but that customers were generally buying less fish than before the pandemic. Processors generally reported that 2020 was worse than 2021. Some processors, (e.g. those involved in fish drying) experienced no change between 2020 and 2021, as they were still unable to sell their products due to continued movement

restrictions. Fish dryers also reported decreased availability of fish for drying and reduced income due to the conditions of the pandemic.

### 3.2.4 Retailers and wholesalers

Respondents working in retail and wholesale shops reported that the fish supply decreased by at least 50% in this year. Supply decreased because distant farmers were unable to deliver fish due to the scarcity of vehicles and limited transportation options. Possibly as a result of decreased fish supply, the number of fish retailers also decreased in 2021. The retailers (both in local and distant markets) generally sell fish in the markets. One wholesaler said, “Since COVID-19 started, our area was impacted heavily because the total fish supply in markets decreased. Besides, the *bepari* [distributor] didn’t have the confidence to send the fish to big cities, as people were leaving the cities and there was a possibility of sudden price fall.”

“Since COVID-19 started, our area was impacted heavily because the total fish supply in markets decreased... Besides, the *bepari* [distributor] didn’t have the confidence to send the fish to big cities, as people were leaving the cities and there was a possibility of sudden price fall.”

*Male Wholesaler, Satkhira, 2021*

Like in wholesale markets, the fish sales also decreased in retail markets. Respondents reported that their customers bought 40-50% less fish than in 2019 because of their financial problems and for safety reasons. Continued limitations on social gatherings continued to impact on the retail sector. Because many hotels closed during the lockdown period and did not reopen, the demand for fish in hotels decreased by approximately 50%. Particularly retailers in Cox’s Bazar region, a popular tourist destination, attributed continued financial difficulties to closures in the tourism sector. Pre-pandemic, retailers supplied rui and catla customary at large Hindu weddings; however, the number of weddings decreased during the pandemic, where weddings that did take place were much smaller than pre-pandemic, impacting on retail sales.

An exception to this was two online retailers. One was a male businessman who started selling fish online a few months before the pandemic as a secondary source of income. His online sales increased with the onset of the pandemic and sustained him throughout. The other was a female teacher with an entrepreneurial spirit, who opened an online bazar marketplace at the beginning of the pandemic. She continued to sell fresh fish through her online bazar; she also began selling value-added, convenient ‘ready-to-cook’ fish, which were very popular. Her online marketplace reached both local and international customers. As mobile purchasing among higher-income customers became more popular, both online retailers experienced increased income, surpassing their income pre-pandemic. The female retailer noted that sometimes her sales surpass her supply causing her to decline a few orders.

According to the Bangladesh frozen foods exporters Association (BFFEA), the export value of frozen fish decreased from 333 to 329 million US dollars in the 2019-20 and 2020-21 financial years, respectively. They attributed this to two factors: firstly, the cost of freezer container rentals increased from 2,000 US dollars in 2020 to 10,000 US dollars in 2021, due to increased export volume from China. Secondly, they observed a decreased in demand for seafood in 2021 compared to 2020 due to the pandemic. They suggested that the decreased demand for seafood was a result of tourist venue closures.

### 3.2.5 Differences in Gender

Both men and women farmers reported the same issues and impacts from the COVID-19 pandemic. Fish dryers were primarily women, who were impacted by reduced availability of fresh fish. For example, one woman fish dryer reported decreased business activity because her fisher husband was unable to work and provide her with fresh fish for drying. She also noted that she was unable to sell her dried fish in markets due to lockdown restrictions.

Similar to the input suppliers' perspective, producers believed that the need to work outside the home increased vulnerability to the impacts of COVID-19. As men more often leave the home for work, men were perceived to be more affected by the pandemic.

The successful female online entrepreneur who created an online bazar was the only respondent who believed that women were impacted by the pandemic more than men. She noted "women are the hardest hit by this situation as this situation limits their job opportunities".

### 3.3 Impacts on consumer behavior

The impacts of COVID-19 pandemic on higher- and lower-income consumers differed. Lower-income respondents (e.g. driver, farmer, fishers, housemaids) reported decreased diversity in their diets, indicating increased food and nutrition insecurity.

The lower-income group reported that their consumption of meats and fish decreased in 2020 and further in 2021 due to the continued conditions of the pandemic. One feed seller reported that they reduced their consumption of meat to once every other week in 2021 compared to once per week in 2020 and 2 days per week in 2019. Some lower income people reported being unable to buy fruit for their children due to financial difficulties resulting from the pandemic. Lower-income respondents reported substituting these more expensive foods for cheaper foods, such that the rate of egg, lentil and vegetable consumption increased in 2021 compared to 2020. The consumption of eggs increased from 1 to 3 days per week, as a cheaper alternative to meat and fish. These trends could indicate that lower-income demographics may be at increased risk of deficiencies in certain micronutrients that are normally supplied through meat and fish (e.g. vitamin B12, vitamin A, iron, and calcium).

While most lower-income participants reported purchasing food from nearby markets, some participants reported that they use their home yard for cultivating papaya, pumpkin and cucumber. Most of the fish farmers reported consuming fish from their ponds during the lockdown periods. One female nursery owner began culturing mola carplets in her ponds to meet the nutritional demands of her family. Most of the respondents with homestead production noted that their diets were unaffected by COVID-19. A common theme in this third round was that subsistence farming is an important resiliency strategy for consumers who have access to land; however, those without access to land will continue to rely on markets or ecosystem services for food security. For example, fishers and dry fish processors reported an increased consumption of dry fish: dry fish processors are usually wives of fishers, where the husband's fishing activities provides fresh fish for processing activities. Their increased consumption of dried fish is possibly a result of reduced access to fisheries and an inability to sell dried fish. Dry fish may be a critical source of micronutrients for these respondents during lean periods as well as crisis such as the COVID-19 pandemic due to its shelf-life and capacity for storage.

While lower-income respondents often reported food substitutions in their diet, only one respondent reported that he could not afford enough food to feed his family. This suggests that lower-income

respondents may experience changes in micronutrient intakes, but generally are able to meet their macronutrient intake; however, this may change if pandemic conditions continue to impact on livelihoods and food availability.

*“Due to this lockdown, the upper-class people may be continuing their life as usual, but we poor people are suffering to live and eat. However, we have to follow the regulations of the govt., but the govt. should think about us, at least about our food.”*

*Male day laborer, Cox’s Bazar, 2021*

In contrast, higher-income participants reported that they chose to consume more nutritious foods (e.g. foods with vitamin C) to support their immunity and health during the pandemic. Furthermore, they increased their consumption of meat, fish and fruits. The role of internet-based transactions was highlighted: they frequently used their mobile phones to order foods from nearby shops and paid with mobile banking apps (e.g. bkaash, nogod) in order to reduce traveling and practice social distancing.

No differences in consumption between men

and women were observed.

### 3.4 Experiences and perceptions of aid and assistance

#### 3.4.1 Social capital and debt

The impacts of Covid-19 on livelihoods varied between lower- and higher-income participants. Most of the lower-income participants took loans from their friends, relatives for supporting their family during both years of the pandemic. Some respondents took loans from microcredit organizations, generally with high interest rates. One of the respondents used to receive a salary of 2,000 BDT per month

every two years before the pandemic; this decreased to 1,000 BDT/month during both years of the pandemic. A few participants applied for loans from commercial banks, but complained that the application procedure was complex and the interest rates were high.

Some respondents, who were financially stable, provided cash and food aid as charity donations during this pandemic situation.

*“My savings is running out. I am surviving my days in debt. Now only if this lockdown is lifted, we have a hope to restart, otherwise, we will be in big trouble.”*

*Female dry fish producer, Cox’s Bazar, 2021*

*“I am now in huge debt, had to loan about 100000 BDT, still I could not repay my debt. Price of all the necessary products are increased, can’t meet up the daily demand. If govt. help us to get loan without interest, that would be beneficial for us. Most of the fishermen involved with different NGOs (Asha, Brac, Uddipon), had to pay a lot of interest, it becomes burden for us to pay.”*

*Male fisher and laborer, Lakshmipur, 2021*



### 3.4.2 Government and non-governmental support

Most of the respondents did not received cash or food aid from any government or non-government organizations. These respondents did not apply for aid because they were unaware of the application procedure and they also thought that the procedure was very complex. A few respondents reported that they received 1,500-10,000 BDT from government and non-government organizations. Some respondents reported that they got 25-30 kg rice from government as food aid, which helped them to survive during lockdown periods. A few respondents explained that they had received 30 kg rice, 4 kg pulse, 6 L oil and 4,000 BDT of cash aid from government. The amount and types of financial aid or food aid varied depending on the government organization and NGO. Some of the respondents reported that they did not receive any food or cash aid in 2021 though they did in 2020.

“Government declared relief money for us, but we are not getting those. The government members and chairmen are distributing this to their relatives, workers of their political parties. We are now surviving on debt. Waiting for withdrawing the banning period on sea, so that we can again earn money by catching and selling fish.”

*Female dry fish producer, Cox's Bazar, 2021*

“All the rich people and political leaders took away the maximum share of relief. We poor are deprived from all facilities. We want more relief and help from Govt. before and during COVID-19 period lockdown and ban period on sea.”

*Female dry fish producer, Cox's Bazar, 2021*

Many lower-income respondents disapproved of the way the government was handling the pandemic, reporting frustration with preventative measures such as travel restrictions and bans due to the impacts on their livelihoods and income-generating activities. Several respondents reported that their equipment (e.g. rickshaws, fishing nets) were confiscated or destroyed by police as a punishment for illegally working during lockdown periods.

“No work to do during lockdown and sea banning period. The government should provide more relief for us. All the facilities and relief consumed by members/chairmen of our locality. Prices of daily needs are increasing day by day. During COVID-19, price reaches its peak. It does not affect rich people. We poor are suffering badly.”

*Female dry fish producer, Cox's Bazar, 2021*

### 3.5 Impacts on child schooling

All of the educational institutions were closed due to the pandemic as a preventative measure against the spread of COVID-19. Most of the institutions alternatively arranged online classes through YouTube or Zoom to continue students' education. Respondents believed that online classes were less effective than face-to-face teaching because at home, students would more easily lose interest in their studies. Some participants hired private tutors for their children, which was an additional financial burden for the family. Lower income participants couldn't afford private tutor so their family members (mother, sister, brother) looked after children's study.

"The situation of family is getting worse day by day. 2021 is the worst year so far as children are upset all the time not getting their desired things, husband always reacts angrily as frequency of getting work is decreasing. Rohingya people are getting opportunity to work, creating competition in workplace. Living cost of host community is increasing. The government should take necessary steps to overcome this situation"

*Female dry fish producer, Cox's Bazar, 2021*

### 3.6 Coping Mechanisms and Adaptations

Hatcheries made several adaptations to their business practices to cope with the reduction in sales in 2021. Hatchery owners used extra ponds and *hapa* to stock and nurse unsold fry. Some began overwintering fry because they perceived it as a profitable activity. They reduced the cost of nursing by purchasing lower-priced feeds or using manure from their own poultry and livestock production. Due to the surplus of fry, some hatcheries included an extra 10-15 fry to each buyer as a free gift to support customer relationships. To continue to supply farmers struggling under residual financial difficulties from 2020, some of the hatchery owners sold fry on full or partial credit (for example, for farmers without enough liquid cash). Hatcheries also accepted orders from distant districts through the telephone and accepted their payments through mobile banking (bkash, nogod, roket). Buyers from nearby districts still came directly to the hatchery premises and bought their fry with cash exchange.

In contrast to the adaptations of the hatcheries, most of the feed sellers stopped selling feed on credit. They used immediate cash payments or mobile banking money transfers. Some respondents used alternative marketing strategies in the face of travel restrictions: for example, one feed seller opened a Facebook page for selling feed during strict lockdown periods.

Farmers adopted strategies for reducing risk. Most of the fish farmers incurred huge losses in the 2020 production cycle(s) due to the low prices of fish as a result of pandemic. In response, they delayed stocking in the next cycle to allow for more time to assess the market dynamics in 2021. The fish farmers who chose to stock fish in 2021 bought feed without cash payment or chose lower-priced feeds.

Fishers adapted their communication strategies, increasingly relying on phones to connect with laborers instead of meeting locations. Laborers also sought alternative and/or supplementary income-generating activities.

To prevent the spread of COVID-19, many input suppliers, producers, and sellers established sanitization facilities for both buyers and laborers.



## 4. Conclusion

Aquatic food value chains in Bangladesh continue to be severely impacted by COVID-19 in 2021. Input suppliers and producers are experiencing both supply- and demand-side shocks. In spite of some restrictions being lifted, aquatic food value chain actors are still burdened by the lingering negative impacts of COVID-19 on their operations, incomes, and livelihoods. In particular, negative impacts from the first year of the pandemic are creating cumulative 'knock-on' effects in 2021.

While most of these actors have been able to adapt in the short-term, many have expressed that debt and reduced market activity are hindering their ability to recover. Despite that transportation and movement restrictions are being lifted, intermittent lockdowns continue to impact on trade and cause logistical bottlenecks, particularly for input suppliers. It is unclear how actors will cope in the long-term, as short-term coping mechanisms are no longer sufficient, such as reduced savings, accumulated debt, and continued financial loss. As the pandemic continues, many small-scale actors have been pushed further into financial and employment insecurity, driving them to cope by seeking supplemental sources of work and income.

Many actors have continued to adapt and innovate in response to the prolonged impacts of the pandemic (e.g. overwintering fry or changing feed source); however, the long-term impacts of these adaptations are unclear. For example, will changing from commercial to homemade feeds impact on the nutritional value of the end product for the consumer? Will overwintering fry have impacts on productivity?


This third round has illuminated that the widely-cited reductions in production among input suppliers and producers in 2020 and 2021 is beginning to impact on the availability of fish, an important animal-sourced food and a vital source of micronutrients. It has also impacted on the affordability of fish: the financial insecurity brought on by income and livelihood losses has reduced fruit and animal-sourced food consumption, with possible implications for micronutrient intakes among the most vulnerable. Subsistence farming has provided some food security for landholders, but the poorest continue to rely on markets. Food preservation has also supported nutritional security; however, if food production continues to stall, preserved food will also become scarcer.

Many respondents in lower-income occupations highlighted experiences of economic and food and nutrition insecurity, whereas wealthier respondents described minimal changes in food consumption and purchasing besides increased intakes of healthful foods.

Although leveraging social capital and informal networks to cope with financial and food insecurity has helped participants to cope with the challenges described, their responses reveal anxieties around paying back loans. This third round of interviews has highlighted continued and cumulative impacts of the COVID-19 pandemic throughout the value-chain.

### 4.1 Implications and recommendations for resiliency

Various strategies adopted by participants underscore the potentially positive ways that aquatic food value chain actors can adapt to sudden shocks such as COVID-19. Participants reveal the success of adopting purchase-on-credit schemes and moving to online marketing and transaction strategies to enable operations in post-pandemic conditions. As international trade continues to be a barrier, efforts



to improve the availability and affordability of local inputs may help stimulate business activities throughout the value-chain.

As short-term coping strategies begin to expire, external interventions to bolster resilience, such as those below, are still warranted.

- Help alleviate heightened financial burdens, particularly among small-scale actors, by increasing the accessibility of government or commercial bank loans, facilitating the application process, reducing or waiving existing loan fees, or extending repayment deadlines.
- Support and promote digital communications through specialized government- or NGO-funded mobile applications to increase business activity despite social-distancing and restricted travel.
- Protect aquatic food value chain actors from sudden and prolonged exposure to shocks by providing index-based insurance, where payouts are based on an index that is related to agricultural losses.
- Support equitable access to nutritious foods through food-assistance programs, such as food stamps, subsidies or community-based subsistence farming strategies.
- Provide universal social safety net coverage to buffer food- and economic-related shocks in the short term, and to help build resilience in the long term.



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