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# Qualitative assessment of COVID-19 impacts on aquatic food value chains in Bangladesh (Round 2)

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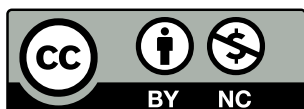
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## Executive summary

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.

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.

This report 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

- Between March and April, input suppliers and producers alike experienced challenges with high input costs, low input availability and accessibility, increased transportation costs, and decreased demand and sales of products, adversely affecting operations and livelihoods.
- From May onwards, input suppliers and producers reported improvements in the challenges they faced in March and April, though sales and incomes remained below 2019 levels.
- Retailers and wholesalers faced reductions in fish supply and sales from March-April, but these mostly recovered to pre-pandemic levels by May-August.
- Larger-scale actors utilized a mixture of strategies to adapt to COVID-19 impacts, while some small-scale actors coped by seeking supplementary sources of income.
- Lower-income consumers described experiencing increased food and nutrition insecurity, but the diets of higher-income consumers generally remained unchanged.
- Most forms of support and assistance are informal. Few respondents reported receiving government support.
- Lower-income respondents described leveraging social capital with friends, relatives, and better-off individuals to obtain loans or food to support their households. Some wealthier respondents reported providing food and financial assistance to their workers or neighbors.

This report underscores the large negative impacts COVID-19 has had on the aquatic food supply chain in Bangladesh, heightening pre-existing inequalities. While many respondents were able to adapt in the short- and medium-term, the following recommendations may help improve the resilience of the aquatic food system and supply chain actors during similar shocks.

- Help alleviate heightened financial burdens, particularly among small-scale actors, by increasing the accessibility of government or commercial bank loans, waiving existing loan fees, or extending repayment deadlines.
- Smooth logistical bottlenecks by improving communication, clarification, flexibility, and awareness of changing government policies that affect aquatic food value chain actors (e.g., transportation permits, import documents, and letter of credit applications).
- Protect aquatic food value chain actors from sudden shocks by providing index-based insurance, where payouts are based on an index that is related to agricultural losses.
- 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.

# 1. Introduction

The COVID-19 pandemic has disrupted food systems globally, resulting in significant negative impacts on economic and food security. In Bangladesh, aquatic food value chains make up a large part of the country's food system. WorldFish conducted longitudinal phone surveys in 2020 to analyze the impacts of COVID-19 on aquatic food value chains, but these did 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.

## 2. Methods

Two rounds of telephone interviews were conducted in May 2020 and September 2020. A list of possible participants who 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. For the first round, 44 participants were purposively sampled to capture diversity in geographic location, actor type, and actor size. No participants were lost to attrition during the second round, but an additional 18 female participants and one male government official were recruited and interviewed, resulting in a total of 63 participants interviewed in the second round. Participants covered all eight divisions of Bangladesh and a variety of actor types (Table 1 and Table 2).

**Table 1.** Participant characteristics by value chain segment.

	Round 1 (March-April 2020)		Round 2 (May-August 2020)	
	N	%	N	%
<b>Actor Type</b>				
Hatchery	7	16	7	11
Feed mill	2	5	2	3
Feed retailer	3	7	3	5
Farmer	7	16	10	16
Fisher	4	9	6	10
Fish retailer	3	7	3	5
Wholesaler	3	7	3	5
Fishing laborer*	3	7	4	6
Fish processor	5	11	11	17
Fry trader ( <i>patilwala</i> )	3	7	3	5
Driver/transport worker	3	7	3	5
Consumers	1	2	8	13

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

**Table 2.** Participant characteristics by division and gender.

	Round 1 (March-April 2020)		Round 2 (May-August 2020)	
	N	%	N	%
<b>Division</b>				
Barisal	1	2	1	2
Chattogram	21	48	35	56
Dhaka	4	9	7	11
Khulna	10	23	12	19
Mymensingh	4	9	4	6
Rajshahi	1	2	1	2
Rangpur	1	2	1	2
Sylhet	2	5	2	3
<b>Gender</b>				
Male	39	89	40	63
Female	5	11	23	37

Round 1 interviews focused on COVID-19 impacts from March to April 2020 (during the country-wide ‘general holiday’ when movement restrictions and business operations were heavily restricted), while Round 2 interviews focused on COVID-19 impacts from May to August 2020 (following the lifting of earlier containment measures). A semi-structured interview guide was designed for Round 1. The guide 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, with the same time periods during the previous year. Consent was obtained from each participant prior to interview.

### 3. Results

Our findings are presented in 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. We group hatcheries, feed mills, feed retailers/sellers, and *patilwala* (itinerant fish seed traders) together for analysis as input suppliers. Responses from farmers, fishers, fish processors, fish harvesting workers, other laborers, and transport workers are grouped together for analysis under the heading ‘producers’.

For suppliers, producers, and retailers/wholesalers, we present analysis of 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). These sections are further divided by impacts during the first and second interview rounds.

## 3.1 Input suppliers

Between March and April, the main challenges described by finfish hatcheries and feed mills included increased prices of inputs, decreased availability and accessibility of inputs, decreased demand and sales volume for products sold, and lower sales prices for those products. Higher labor wages and transportation costs were particularly important impacts for most input suppliers. From May to August, hatcheries and feed mills explained that input prices, availability and accessibility, and sales volumes and prices had normalized slightly, but had not returned to the levels prior to COVID-19.

### 3.1.1.a Increases in input costs during Round 1

Carp hatcheries were severely affected by the increased price of pituitary gland hormone (a natural hormone used for breeding carp) from March to April. Pituitary gland hormone is mostly imported from India and imports were halted from the last week of March. Demand for pituitary gland hormone was high at this time as March onward is the peak season for carp breeding. Low supply and high demand for pituitary gland hormone caused the price to increase to 2-3 times the pre-COVID-19 price.

To cope with the high costs of pituitary gland hormone, many carp hatcheries switched to synthetic hormones. However, hatcheries explained that synthetic hormones are an inferior alternative to pituitary gland hormone, resulting in lower ovulation and higher rates of hatchling mortality.

Similarly, shrimp hatcheries reported higher input prices for imported bio-products (e.g., probiotics and prebiotics) during this period, which incurred a reported 20-30% additional cost.

Some large input suppliers were able to adapt to high input costs by capitalizing on their relationships with local leaders or those in positions of power. For example, higher labor costs were partly attributed to movement restrictions in March and April. Free movement was halted even at the local level. By speaking with local leaders, one large fish hatchery was able to resolve this issue. Similar to the large hatcheries, one large feed mill was able to cope with higher transportation costs by leveraging their existing relationships with influential actors. This respondent explained how other small entrepreneurs had to pay more for transport, but because they are “well connected and formed trustworthy links with the other stakeholders, that [kept them] in a safer zone in terms of price negotiation.”

### 3.1.1.b Persistent increases in input costs during Round 2

Between May and August, hatcheries described the continued rise in prices for pituitary gland hormone, bioproducts, and supplementary feed (e.g., mustard oil cake and soyabean meal). The increased price of supplementary feed was attributed to the high market price of rice. One respondent from a hatchery noted that the price of pituitary gland hormone rose from 25 BDT/piece between March and April to 40 BDT/piece between May and August, compared to 8 BDT/piece the previous year. Among feed mills and retailers, soyabean meal prices were

reportedly continuing to increase from 30 BDT/kg in Round 1 to 40 BDT/kg in Round 2. Retailers also noted that while feed prices had decreased compared to March and April, they remained higher than in the previous year. One retailer explained that the high feed cost was due to high transportation costs.

### 3.1.1.c Improvements in transportation costs during Round 2

Almost all participants noted that labor and transport availability returned to normal levels and prices fell somewhat after May. However, some respondents stated that transportation prices were still high compared to the previous year. For example, one hatchery explained that transportation costs were currently 10% higher than last year, but 20% lower than March and April.

### 3.1.2.a Decreases in input availability and accessibility during Round 1

Input availability and accessibility were reported as challenges in March and April. Fish hatcheries cited limited availability of oxygen cylinders used to provide aeration for fish seed prior to delivery to customers. To adapt to uncertainties in the availability of oxygen cylinders, one large hatchery stocked extra oxygen cylinders in advance. This hatchery also addressed accessibility issues by leveraging existing relationships with suppliers; after negotiations, their regular suppliers were willing to come to their shop to supply the required inputs.

Shrimp hatcheries noted limited availability of imported bio-products and feed. Shrimp hatcheries coped with the limited availability of imported bio-products and feed by using alternatives from local sources. For example, some local entrepreneurs have begun producing bio-products themselves and selling them at a lower price than imported products, but no studies have been conducted to evaluate their quality.

Some fish hatcheries also described problems accessing inputs due to movement restrictions. For feed companies, labor shortages were the primary challenge.

### 3.1.2.b Persistent challenges with input availability and accessibility during Round 2

Many hatcheries and feed mills described persistent challenges with imported inputs despite import restrictions being lifted. Shrimp hatcheries explained how bureaucratic processes delayed access to imported bioproducts. Hatcheries are required to obtain import documents from the Department of Fisheries (DOF) central office in Dhaka. Most shrimp hatcheries are in Cox's Bazar, making traveling to Dhaka to obtain the necessary documents amid movement restrictions difficult. Additionally, during COVID-19, the application for a letter of credit (need to secure imports) changed from in-person to online, leaving many hatcheries unaware and confused by the new process. Due to these bottlenecks, hatcheries reported an additional 2-3 months to import bioproducts. To address these challenges, hatcheries suggested that the DOF Cox's Bazar office be given power of attorney to issue importing documents during this time.

Feed mills also reported similar import-related challenges in which, for safety reasons, DOF is now requiring import clearance before unloading products from ports, increasing delivery times and costs. As the usual imported feed ingredients were hampered by the slow shipment processes,

feed mills have continued using local feed ingredients instead, despite their reportedly inferior quality and higher prices.

### 3.1.3.a Decline in seed and feed demand, sales volumes and sale prices during Round 1

Between March and April, hatcheries, feed mills, *patilwala*, and feed sellers all reported declines in demand and sales volumes.

Feed sellers reported reductions in sales because of low demand, with one feed seller citing a decrease from 900 tonnes during March-April 2019 to 300 tonnes in the same period of 2020. Additionally, another feed seller explained how declining sales resulted in a loss of feed quality, as feed was kept in storage for longer than usual.

Hatcheries and feed mills attributed the low demand for their products to transport restrictions and low farmgate prices for fish. Low farmgate prices caused farmers to delay harvesting their ponds and/or reduce feeding rates, limiting purchases of new seed or feed. Transport disruptions also prevented buyers from reaching hatcheries. Furthermore, many *patilwala* purchased half the volume of fish seed they had bought during the same period in 2019 year, as many villages restricted their movements.

To cope with lower demand for seed and feed, *patilwala* and feed sellers had to sell their products at lower prices. One feed seller described adapting to low demand by delivering feed to farmers, resulting in additional out of pocket expenses.

### 3.1.3.b Persistent decline in seed and feed demand, sales volumes and sales prices during Round 2

For feed sellers, reported sales volumes were still low between May and August, falling between 2-23%, depending on the respondent interviewed, compared to the same period during the previous year. For example, one feed seller said that the amount of feed sold had dropped from 900 MT in May-August 2019 to 300 MT in March-April 2020, before increasing to 500 MT in May-August 2020. Although the total amount of feed sold declined, feed sellers reported that the price remained relatively stable.

The production, demand, price, and volume of fish seed sales all decreased compared to 2019 but increased slightly from May to August. The demand for fry was still reportedly low, with *patilwala* attributing this to farmers' loss of profit due to persistently low farmgate prices and their subsequent inability to purchase fry for restocking. These challenges were compounded by heavy flooding from June to August, which had resulted in losses of seed by hatcheries. The total amount of fry sold has continued to decline. For example, one hatchery reported only having sold 4.5 million fry between May and August, as opposed to 10 million during the same months in 2019. *Patilwala* and feed sellers continued to sell their products at lower prices. One *patilwala* resorted to selling unsold fry at a very low price to farmers, or sometimes even stocking his own pond with this fry at the end of each day.

Similarly, dried fish producers reported selling dry fish at lower prices because of the low demand. However, the price of dry fish had also somewhat improved from May onwards. On average, one dry fish producer sold her dry fish for 312 BDT/kg in March-April 2019, falling to 212 BDT/kg in March-April 2020, before increasing to 274 BDT/kg in May-August 2020.

#### 3.1.4.a Financial losses and lower production during Round 1

Many hatcheries, feed mills, and feed sellers reported substantial financial losses because of these challenges they faced in March and April. Feed sellers and *patilwala* described losing work and income. Hatcheries and feed mills reported lowering production, reducing or halting business operations, and laying-off or hiring fewer temporary workers to cope with financial strains. One shrimp hatchery resorted to a tactic referred to a “force selling” - selling shrimp post-larvae (PL) at low prices, trying to persuade farmers to buy as much as possible, and supplying PL to farmers in the form of in-kind credit to be repaid after harvesting.

During the initial shock of COVID-19, one fish hatchery reported being forced to drain ponds containing fish seed because they did not have enough resources to maintain this volume of seed. A tilapia hatchery owner reported that tilapia seed production was particularly severely affected by COVID-19, as farmers postponed stocking tilapia due to uncertainties around input availability and price, and false rumors linking tilapia to COVID-19 infection. Ultimately, sales by farmers were seen to be the key factor in offsetting losses experienced by hatcheries, as one shrimp hatchery owner describes in the following quote:

“I am truly concerned about the marginal farmers. If they don’t get good price of their fish it will impact the recovery of seed loans and I guess half of the hatcheries will not run next year”

- Male respondent, shrimp hatchery,  
Cox’s Bazar

#### 3.1.4.b Improvements in production and profits during Round 2

The general sentiment among hatcheries, feed mills and sellers, and fry traders was that production and profits improved after May, but they were still lower than the previous year. Hatcheries explained that the initial financial losses from March and April were minimized between May and August. Specifically, one hatchery reported a 4 million BDT financial loss compared to 2019, with 60% of losses occurring within the first two months of the COVID-19 pandemic, and the rest in the following four months. Feed sellers have also reported an increase in business hours to six hours/day between May and August, compared to two hours/day in March and April.

#### 3.1.4.c Changes in resilience strategies during Round 2

Large-scale fish and shrimp hatcheries were able to adapt to the persistently low prices and sales volumes using a variety of strategies. To sell higher volumes of seed and feed, BRAC reported giving customers an additional 5% of fish seed (on top of the usual 7% extra to mitigate mortality losses) to entice dealers and farmers to purchase more. For feed, BRAC began to offer lower prices to meet sales targets.

Similarly, shrimp hatcheries also reported giving extra PLs to seed dealers. Additionally, the Bangladesh Shrimp Hatchery Owners Association (BSHOA) introduced a new quota system under which all shrimp hatchery operators in Cox’s Bazar agreed to produce a specified number of PL. Due to the quota system and limited availability of wild shrimp brood, hatcheries reported an

increase in PL price between May and August, compared to both the March and April period and 2019.

Shrimp hatcheries also explained that they were able to recover the losses incurred in March and April as a result. One hatchery highlighted that 90% of hatcheries made a profit in 2020, and that the average price of PL was 0.65 BDT/piece, compared to 0.45 BDT/piece in 2019. Respondents stated that this was beneficial to farmers as well as hatcheries because the quality of PL available to farmers had improved as a result.

However, small-scale feed dealers and *patilwalas* have described being pushed further into financial insecurity. For example, one feed retailer explained that the impact of COVID-19 on his business was so significant that he had to sell 0.2 acres of land worth BDT 0.4 million to support his workers and family. While some input suppliers are continuing to lay off workers to cope with financial losses, this small-scale feed retailer and some others have been adamant about keeping their workers and paying them the same wage.

Seeking supplemental income was also a common strategy used by smaller-scale actors. For example, because of the negative impact of COVID-19 on demand for fry, one *patilwala* was driven to change occupations from fry trader to fish farmer and day laborer to support his family. Because a reduction in her income, a female shrimp PL collector reported beginning to work as a crab farm laborer, collecting PL in the morning before working at the farm.

## 3.2 Producers

Similar to input suppliers, the main challenges described by producers amid COVID-19 were high input costs, low input availability and accessibility, increased transportation costs, and decreased demand for and sales of fish. These challenges disrupted livelihoods and incomes, particularly small-scale actors. Low farmgate prices were perceived to be the main driver of adverse COVID-19 impacts. From May onwards, producers experienced small improvements, with many reporting increased workdays and income. These gains, however, were still not comparable to levels during the previous year, and many producers faced challenges with persistently low farmgate prices.

### 3.2.1.a Decreases in input affordability, availability, and accessibility during Round 1

The main input access challenge faced by small- and large-scale fishers in March and April was the limited supply of ice, with many fishers explaining that ice shortages reduced the number of days they could fish. Farmers highlighted increased costs for seed, feed, transport, and casual labor.

Shrimp farmers described low availability and high prices for wild shrimp PL. One female shrimp farmer explained how she was unable to purchase shrimp PL because of the high price of wild seed and a lack of money to invest. Due to low farmgate prices, she did not sell her existing shrimp, prawn, and fish, hindering her ability to generate money needed to purchase the next batch of seed. To cope with limited availability and high costs of wild PL, some shrimp farmers stocked their *gher* with hatchery produced PL instead, despite hatchery PL being less preferred because of perceived inferior quality.

While some shrimp farmers experienced challenges with purchasing seed, fish and crab farmers experienced higher costs and lower availability of feed. Because of low supply and high demand, from 2019 to 2020 the price of rice bran was reported to have increased from BDT 1100 to 1400 per 50 kg bag. The price of mustard oil cake rose from BDT 1600 to 2000 per 60 kg bag, and the cost of wheat bran grew from BDT 1400 to 1800 per 50 kg.

Crab farmers described increased prices for small-sized tilapia (which they use for crab feed), up from BDT 50/kg pre-COVID-19 to BDT 90/kg due to poor supply during March-April 2020 due to COVID-19.

Fish farmers attributed limited access to feed to movement restrictions. They adapted to disruptions in feed supply by stocking more feed in advance and supplementing their usual feeds with alternatives. For example, some farmers substituted non-pelleted feed for pelleted feed due to the lower cost of the former, and pressures to invest less due to COVID-19-related uncertainties. One crab farmer reported stocking tilapia fry in his pond to minimize feed expenditures.

Additionally, crab farmers described deterioration in the quality of their crabs post-harvest due to the inaccessibility of transport, as they had to resort to using autorickshaws instead of faster pick-up vans. This increased transport times from farms to processing plants, resulting in lower muscle quality and sometimes even crab mortality.

### 3.2.1.b Improvements in input and transportation affordability during Round 2

High transport costs and poor availability had significant adverse effects on farmers in March and April, but reportedly improved once restrictions were lifted. One crab farmer noted that “the transportation problem was very acute in last March-April. But since the lockdown [has been] withdrawn from the country the problem of transportation has been solved.”

However, farmers explained that transportation costs were still high compared to last year, with prices having increased 20% in the first two months of the pandemic and decreased from this peak by 10% in the four following months.

Farmers noted that input costs remained relatively the same between May and August 2020, but because 50% of fish remained unsold in the farm, farmers incurred additional feeding and management costs:

“Due to COVID-19 the overall operating cost of aquaculture has increased many-fold. So, if the government can take some initiative for female fish farmers like zero interest loan than it would be very helpful for us to carry the cost of aquaculture.”

**- Female respondent, fish farmer, Khulna**

### 3.2.1.c Persistent challenges with input availability and accessibility during Round 2

Some farmers explained that despite feed prices remaining relatively stable, availability and accessibility of feed were continuous challenges. One farmer described how feed was sometimes not available in nearby markets, resulting in extra transport costs from having to purchase feed



from distant markets. However, another farmer mentioned that compared to April-May, the availability and supply of feed had improved.

To cope with the limited input availability and accessibility, some farmers stocked extra feed in advance. While no farmers mentioned persistent challenges accessing fish seed, one crab farmer did mention that he had established a hatchery to support the farm should any seed shortages occur in the future.

In contrast, fishers have noted that input availability, primarily ice, has returned to normal. One fisher who also owns an ice factory reported an increase in ice sales between July and August compared to the initial months of COVID-19.

### 3.2.2.a Low sales prices and volumes during Round 1

The majority of fishers and farmers highlighted receiving lower sales prices for fish than they had done in the same period during 2019. Crab farmers, for example, reported that the price of soft-shell crab had dropped from BDT 700/kg in 2019 to BDT 450/kg at the time of the survey. Additionally, uncertainties around exports because of low demand in international markets amid COVID-19 meant they were unable to sell crabs. As described below, exports were considered a major challenge for crab farmers:

“The government as well the international organizations should take some initiative on this export-oriented business. If the export agents are able to export product regularly we will get a good price”

- Male respondent, crab farmer, Khulna

### 3.2.2.b Persistently low sales prices and volumes during Round 2

After May, fish and crab farmers as well as fishers all reported low sales prices, albeit for different reasons. Fish farmers underscored the continued low farmgate prices of fish compared to 2019, although some said that prices had improved between May and August. One farmer described how both the volume and sales price of fish have declined in 2020. While he sold 400 kg fish for BDT 120,000 in July-August 2019, he only sold 200 kg fish at 40,000 BDT in July-August 2020. A female fish farmer explained that, because of low farmgate prices, she failed to sell all her stock, resulting in a financial loss of BDT 50,000. Farmers explained that they were driven to sell fish at a low prices due to the high supply of fish from delayed harvests and the nearing hilsa season, during which prices and demand for farmed fish are usually reach their lowest

Crab farmers have likewise continued to experience low farmgate prices. One crab farmer reported that the price of soft-shell crabs has decreased gradually day by day and that, even after export restrictions were lifted, he was receiving prices 5% lower than April-May. Another crab farmer attributed the falling prices to the oversupply of crab in global markets. Many crab exporters stored their crabs in processing centers during March and April, which ended up flooding the market once exports were open again. While exports have resumed, some farmers still described disruptions and

“In Bangladesh crab is mainly used to export in the international market. As a result when COVID-19 started the export market collapsed. If local people adapt to consuming crab regularly we will be able to get satisfactory price.”

- Female respondent, crab collector, Khulna

delays. One participant suggested that, amid export disruptions, increased local demand may help improve crab prices:

Fishers also reported low market prices. Many fishers explained that the large fish catch and landings in the past few months have resulted in an oversupply of fish, driving prices down. Fishers and fish laborers reported catching more fish between July and August 2020 than in July-August 2019 and April-May 2020.

### 3.2.3.a Decreased harvests and impacts on livelihoods during Round 1

Challenges in March and April negatively affected the livelihoods of farmers and fishers, and actors such as transporters, harvesters, and laborers. Many fish, shrimp, and crab farmers delayed their harvests to cope with low market prices, resulting in reduced demand for harvesting labor and transport services. Likewise, small-scale fishers reduced fishing efforts or halted fishing entirely. The reduction in fishing days and hours resulted in a significant loss of income for small- and large-scale fishers alike. Female fishers were particularly hard-hit by COVID-19. Two female fisher respondents describing feelings of helplessness because they were unable to find any work.

Among drivers transporting fish production inputs and products, working hours declined by 30-40% and incomes decreased by nearly 70% due to lower fish and shrimp landings and movement restrictions. The following quote describes the uncertainties and anxieties faced by fish transporters amid COVID-19:

“The COVID-19 pandemic has extremely changed the livelihoods of drivers. I am wondering what will happen if it continues for days”

- Male respondent, fish transporter, Mymensingh

Fish harvesters and fishing laborers experienced a similarly drastic reduction in working hours. Fishing laborers also described loss of income due to low catch volumes and low prices for fish in local markets. Many laborers employed in drying fish lost their jobs. While activities in the dried fish industry such as fish collection, sorting, drying, and processing remained active, downstream activities such as transportation and marketing were disrupted. For fish cutters (workers in retail markets who earn a living by cleaning fish purchased by consumers), volumes of fish processed declined and incomes were reduced by at least 20%.

### 3.2.3.b Persistent decreases in harvests and livelihood impacts during Round 2

Farmers continued to delay harvests between May and August, waiting for fish prices to improve. Farmers and fishers generally described small improvements in income levels from May to August, but these were still short of 2019 levels.

One crab farmer explained that the drop in price and sudden losses caused him to cut the number of regular laborers working on his farm. Many crab farmers coped by reducing stocking rates. While fishers experienced increased fish catches from May-August, they still faced low incomes due to the continually depressed fish prices.



Fishing laborers, harvesting team members, processing workers, and transporters all described improvements in working hours and incomes between May and August, but they remained below 2020 levels. These workers were significantly affected by income losses, with many driven to seek supplemental work and some using their savings to meet their needs. Among fish harvesters, the reported workdays plunged from 25-28 days/month at 12,000-15,000 BDT/month in May-August 2019, to 8-12 days/month at 4,800-5,000 BDT/month in March-April 2020, rising to 15-20 days/month at 7,500-8,000 BDT/month in May-August 2020. One fish harvester explained that his income had fallen at least 40% because low fish demand and prices had forced farmers to reduce sales, negatively impacting his livelihood and his family.

The decreased fish demand, sales, and incomes for farmers also meant lower incomes for transporters. Fish, shrimp, crab and fry transporters reported workdays and incomes ranging from 10-15 days and BDT 15,000-20,000 per month in May-August 2020, up from 4-6 days and BDT 5,000-12,000 per month in March-April 2020. However, this will still lower than 2019, when transporters reporting working 20-25 days and earning BDT 25,000 each month. One transporter explained that compared to the previous year, volumes of fish transported had declined by 30%. Although incomes have improved, transporters have still been unable to recover fully from the economic losses they experienced in March and April.

Due to the low demand for dried fish as well as the rainy season, almost all dried fish producers decreased their production, resulting in significant income losses compared to the previous year. However, following May, many have reported that their situations had improved. For example, one dried fish producer explained that she usually earned BDT 35,000/month in 2019 but only earned BDT 30,000/month at the time of interview, though this was still an improvement from the BDT 20,000/month she earned from March to April.

### 3.3 Retailers and wholesalers

#### 3.3.1.a Decreased fish supply, sales prices, and sales volumes during Round 1

During March and April, fish wholesalers and retailers described drastic reductions in the supply of fish. One fish wholesaler reported a 50% drop in supply, from 20 tonnes per day to 10 tonnes in March-April. Increased transportation costs were also a challenge for retailers, with one retailer resorting to using their own van to reduce transport costs.

Wholesalers and retailers reported reductions in price of nearly 30% across all species compared to the previous year, due to lower demand. The main reasons for lower demand were the movement restrictions and transportation disruptions as well as closures of restaurants and hotels, which represent their biggest customers.

Dried fish retailers described lower sales prices because of a 20-30% drop in demand and a nearly 25% decrease in sales. One retailer described a decline in total sales volume from 50 kg of fish per day to 25 kg/day. Other retailers also reported decreases in volumes traded, business closures, and significant financial losses due to these challenges. Some fish retailers described coping with losses by paying wages, transportation, and other business operating costs out of their own pockets.

A respondent from a large seafood export company reported that about 299 consignments of seafood from Bangladesh had already been cancelled by international buyers, resulting in a dramatic drop in demand for large shrimp. The same export company estimated having incurred a financial loss of about BDT 4 billion, while also anticipating a 60% reduction shrimp production in Bangladesh in 2021 compared to 2020.

#### 3.3.1.b Improved fish supply, sales prices, and sales volumes during Round 2

For the shrimp industry, respondents reported that there was good demand and prices for large-size prawn in the global market. The price of other exported shrimp items fell by around 1 USD/kg (BDT 85/kg) in the global market. However, this was not the case in local markets. Wholesalers and retailers in the Khulna region, where most of the shrimp and prawn production in Bangladesh occurs, reported that the price of shrimp was at least BDT 100-150 per kg less than pre-COVID-19. Shrimp wholesalers expected 10-20% lower production compared to 2019 due to the impacts of COVID-19.

However, the situation has improved for fish wholesalers. Larger wholesalers explained that the wholesale industry had returned to normal from May-August. One participant explaining that the amount of daily fish sold was 2.5-3 metric tonnes, and the fish supply has increased by 1.2-tonnes/day compared to March-April. The price of fish has also reportedly risen 15-20% between May and August. Both the supply and price of fish after May were reported to be similar to 2019.

From May-August, retailers similarly described increased availability and prices of fish. However, some retailers noted decreased sales volumes and income compared to 2019. Retailers also mentioned continued low demand for fish, except for lower-priced fish (e.g., tilapia, pangasius, bighead carp). To cope with low sales volumes, one retailer sometimes sold fish door to door and leased out agricultural land to others to supplement his income.

Another small-scale fish wholesaler reported that he was still experiencing challenges. Specifically, this respondent explained that fish demand in the wholesale market is still very low, and the number of operating fish retailers has continued to decrease. As a result, his income had decreased 30-40% and he had to pay his laborers BDT 70 less per day.

### 3.4 Impacts on consumer behavior

#### 3.4.1.a Consumer behavior during Round 1

Effects on consumer behavior differed among lower- and higher-income consumers. Participants with lower incomes, including smallholder farmers and small-scale fishers, *patilwala*, drivers, and laborers, described decreased dietary diversity and increased experiences of food insecurity.

Reductions in household intake and purchases of animal-sourced foods, particularly fish and meat, were commonly cited by these respondents. For example, one farmer described how her family had not consumed meat in a single meal for a month during the COVID-19 outbreak, a decline from their usual consumption of four times per month prior to the pandemic. These declines in animal-sourced food consumption were mainly attributed to loss of income and livelihoods combined with the reportedly high prices of animal-sourced foods. At the same time, these respondents reported eating more affordable staple foods such potatoes, lentils, and vegetables.

Largely due to loss of work and income, laborers and drivers also described skipping meals, eating less per meal, purchasing less nutritious foods (both quantity and quality), and/or purchasing fewer food items, suggesting that they are experiencing food and nutrition insecurity.

One fishing laborer explained how his school-aged children had to start working at the landing center to supplement their declining household income and cope with increasing food and nutrition insecurity.

However, some lower-income respondents were better able to adapt to COVID-related impacts on food access. Some respondents with homegardens or who were involved in subsistence farming reported being able to maintain normal levels of food consumption. Similarly, dried fish processors and retailers highlighted that they were able to save dried fish or dry fish themselves for household consumption. A female dry fish retailer, for example, explained how her household was still able to consume fresh fish and dry fish from fishing as well as vegetables from a small vegetable farm in her agricultural land.

On the other hand, participants with higher incomes, including owners of large hatcheries and feed mills and employees of seafood export companies, reported being able to switch to using mobile applications for grocery shopping and delivery. They also described eating more high-quality, nutritious foods such fruits and those rich in vitamin C with the intent of boosting their immune systems. These respondents also partook in food safety and hygiene practices such as soaking their vegetables and fruits in saltwater before consumption.

#### 3.4.1.b Consumer behavior during Round 2

The food consumption patterns of high-income participants remained the same between May and August. Low-income participants, however, described eating more meat and fish, close to the amount they had consumed prior to the COVID-19 pandemic. For example, one farmer said that in the previous year, his family would consume fish 6 days/week. This decreased to 3 days/week in March-April 2020 but increased again to 5 days/week in May-August 2020. These participants continued to consume more affordable foods such as potatoes, lentils, and vegetables and also mentioned eating more dried fish.

### 3.5 Aid and assistance

#### 3.5.1 Social capital and debt during Round 1

In the context of economic and food and nutrition insecurity brought on by COVID-19, participants with lower incomes described leveraging social capital with friends, relatives, and/or wealthier actors to support their families. For example, one driver explained how his local grocery shop allowed him to delay payment for his groceries.

Respondents operating larger businesses often reported providing food and financial assistance to their workers, neighbors, and other small-scale actors. To support its workers, one shrimp hatchery gave an extra one-month's salary to each worker. Many lower-income participants were able to obtain loans from friends and family to cope with losses of income or livelihood activities. Fishing laborers and fish harvesters in particular often took loans from fishers and farmers, on the condition of working for them in the following year (*dadon*). In addition, some operators of larger businesses explained how they intended to provide *dadon*. This may be due to perceptions that the production and sale of fish is integral in offsetting COVID-19 impacts on the aquatic food system, as described in the subsequent quote:

“Coronavirus is currently a threat for the whole world. There is no way to avoid this risk. As a wholesaler it’s my main duty to encourage and help the farmers for farming more fish. If they (farmers) exist in this problem we (wholesalers) will also exist”

- Male respondent, fish wholesaler, Khulna

However, most recipients of *dadon* described anxieties, fears, and pressures around paying back these loans, which were amplified by the uncertainties surrounding COVID-19.

### 3.5.2.a Limited government and non-governmental support during Round 1

Respondents described a number of government interventions that could help support them during COVID-19. Respondents from fish and shrimp hatcheries, feed mills, and seafood export companies explained that economic stimulus funds from the government would be helpful and that they are currently waiting to receive this type of support. However noted that these funds may be difficult to obtain and challenges around accessing these funds should be addressed by working closely with government policymakers.

Most respondents reported that they had not yet received any financial, food, or cash aid from government or NGOs, although a few respondents had received BDT 1500 in financial assistance from the NGO BRAC. Some respondents explained that they are still waiting to receive government food rations.

A few respondents attributed increased transportations costs to confusion around the enforcement of movement restrictions, as fish and shrimp transportation were supposed to be exempt from these restrictions. One participant described how some drivers had to pay bribe money on return trips when their vehicles were empty (i.e., no fish or fish seed).

Some respondents explained that loans provided by the government or low interest bank loans would help to support their businesses, as noted in the following quote:

“If government arranges some loans then we will be able to recover this loss [from current high shrimp PL prices] somehow. If we able to stand, the fisheries sector will stand”

- Male respondent, shrimp farmer, Khulna

However, one respondent explained how bank loans were oftentimes distributed inequitably and should instead benefit those who need them most:

“Not sure what will happen in near future but the bank loan and benefit it’s always been for the musclemen of the society and less chance to reach to the real entrepreneurs”

- Male respondent, fish hatchery, Jashore

### 3.5.2.b Persistent challenges with government support during Round 2

Almost all respondents had not received any form of government aid by August, with many still hoping to receive stimulus funds. As many actors in the aquatic food value chain operate outside the formal banking system, one participant explained that they may not receive stimulus funds because doing so relies on being part of the formal banking system. Fishers described receiving food rations during the fishing ban, but they hoped to be given additional support for COVID-19 impacts.

Although many of the female respondents surveyed noted accepting financial support or food, either from the government or NGOs, this aid was usually not tied to COVID-19. Instead, these participants were given financial aid for participating in trainings. Many of these women expressed a desire for additional trainings on alternative income-generating activities in order to better support their families during COVID-19:

“Now we had to completely depend on husband’s income as we are not working in the fish drying yard. Like hilsa fishers, the government should provide minimum interest loans or incentives for alternative livelihoods (for women).”

- Female respondent, dry fish processor, Cox’s Bazar

## 4. Conclusion

Aquatic food value chains in Bangladesh have been severely impacted by COVID-19. Input suppliers and producers are experiencing both supply- and demand-side shocks. In spite of the movement restrictions being lifted in May, aquatic food value chain actors are still burdened by the lingering negative impacts of COVID-19 on their operations, incomes, and livelihoods.

While most of these actors have been able to adapt in the short-term, it is unclear how they will cope in the medium- to long-term, as many are experiencing large financial losses and describe unsustainable coping mechanisms. As the pandemic continues on, 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.

Transportation and movement restrictions were cited as major barriers among all actors during March and April, but these challenges have largely been addressed after May. However, certain logistical bottlenecks continue to persist. From March-April, unclear messaging around exemptions from mobility restrictions for the fisheries sector disrupted the movement of fish. Between May and August, imports and credit access were hindered by excessively bureaucratic processes.

Widely cited disruptions in production among input suppliers and producers also have the potential to negatively impact the availability and accessibility of fish, an important animal-sourced food and a vital source of micronutrients. The financial insecurity brought on by income and livelihood losses is likely to exacerbate the health consequences of reduced animal-sourced food consumption. Disparities in food access and consumer behavior are evident and have persisted between May and August.

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. Additionally, while many better-off actors noted following food safety and hygiene practices (suggesting awareness of their importance, especially during COVID-19), no low-income participants reported doing so.

Our findings also highlight the importance of homestead food/fish production and food preservation practices in securing access to and availability of nutritious foods, particularly during economic shocks or periods of food shortages.

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 increasing anxieties around paying back loans. The later round of interviews highlighted additional harmful strategies that small-scale actors utilized to cope such as selling productive assets.

## 4.1 Implications and recommendations for resiliency

Various strategies taken on by participants underscore the potentially positive ways that aquatic food value chain actors can adapt to sudden shocks such as COVID-19. Participants from shrimp hatcheries reveal the success of cooperating under an agreed quota system, where they were able to weather the impacts of COVID-19 on their operations. Strategies based on cooperation may also be applicable in other segments of the value chain. For example, coordination between farmers and laborers can help address sudden labor shortages. Participants were also able to quickly substitute their usual inputs for local alternatives. However, questions around quality remain. Efforts to test and improve local inputs, while ensuring comparable prices, may help mitigate the negative effects of COVID-19 on input availability.

Although participants were able to adopt these coping strategies, 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, waiving existing loan fees, or extending repayment deadlines.
- Smooth logistical bottlenecks by improving communication, clarification, flexibility, and awareness of changing government policies that affect aquatic food value chain actors (e.g., transportation permits, import documents, and letter of credit applications).
- Protect aquatic food value chain actors from sudden shocks by providing index-based insurance, where payouts are based on an index that is related to agricultural losses.

- 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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