CGIAR RESEARCH PROGRAM ON Fish Led by WorldFish

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Impacts of COVID-19 on aquatic food supply chains in Bangladesh, Egypt, India, Myanmar, Nigeria and Timor-Leste, February-April 2020

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About FISH

The CGIAR Research Program on Fish Agri-Food Systems (FISH) is a multidisciplinary research program. Designed in collaboration with research partners, beneficiaries and stakeholders, FISH develops and implements research innovations that optimize the individual and joint contributions of aquaculture and small-scale fisheries to reducing poverty, improving food and nutrition security and sustaining the underlying natural resources and ecosystems services upon which both depend. The program is led by WorldFish, a member of the CGIAR Consortium. CGIAR is a global research partnership for a food secure future.

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1. Introduction

To assess the evolving impacts of the COVID-19 pandemic, we conducted a multi-country survey of fish supply chain actors in Bangladesh, India (Andhra-Pradesh, Assam and Odisha), Myanmar, Nigeria, Egypt and Timor-Leste (TL), to evaluate the availability and price of aquatic foods and production inputs. The sample included hatcheries (n=78), feed mills (n=26), non-pelleted feed sellers (n=31), pelleted feed sellers (n=64), farmers (n=233) processors (n=39), traders (n=85), retailers (n=78) and fishers (n=131). February trends were compared to March and April trends when COVID-19 measures were instated in the surveyed countries. The complete summary of survey results can be accessed here.

2. Methodology

Respondents were selected based on snowball sampling drawing on existing contacts from projects. In each location, local enumerators conducted the survey by telephone and recorded responses on the KOBO digital data entry platform. The survey was divided in two rounds. In round one, recall data was collected at the beginning of May for the months of February, March, and April to provide a baseline against which subsequent weekly data could be assessed. In round two, weekly or bi-monthly data was collected from the end of May until August. The survey was divided into two parts, a general section, and an actor-specific section. In the first section, respondents were asked questions about employment, wages, access to inputs, transportation, and buyers. In the following section, questions were asked about operation suspensions, inputs procured and sales for each ingredient/feed/fish type. Data collected was subsequently uploaded onto Power BI.

3. General Impacts

3.1 Labor

COVID-19 likely contributed to a decrease in hiring of daily labour as well as difficulties in accessing labour. **The share of respondents hiring daily labor decreased across Nigeria, India and Bangladesh as lockdown measures were instated in March and April.** In Nigeria and India, the share of respondents hiring daily workers dropped by around 31 percentages points (pp) and 14 pp for men and women respectively between February and April (Figure 1). Rates decreased more moderately in Bangladesh, remained relatively stable Myanmar and Timor-Leste, and increased in Egypt. All supply chain actors employed less labor, except for hatcheries which were entering their main production season in several countries. The share of businesses unable to hire workers increased in Bangladesh, India and Myanmar as the lockdown progressed, but was generally quite low. The drop-in market demand and lockdown measures may have resulted in these decreased hiring rates, posing a threat to the livelihood of informal workers who often rely on daily wages.

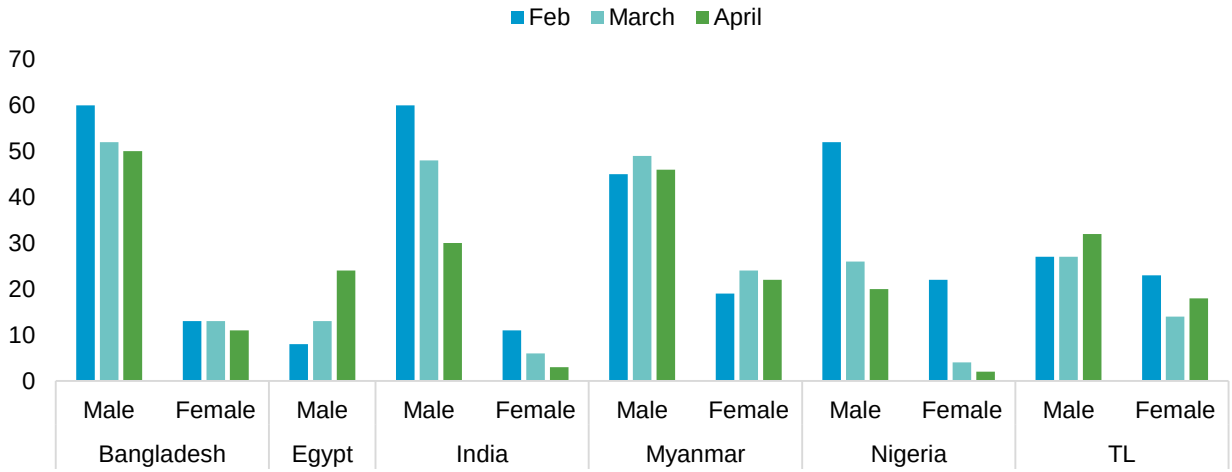

Figure 1. Share of respondents hiring female/male daily labor in surveyed countries (%).

Increases in average daily wages between February and April in Egypt, Nigeria, India and Bangladesh may have signaled difficulties among supply chain actors in accessing labor. Wages increased for men in Egypt & Nigeria (+20%), women in Nigeria (+49%), men in India and women in Bangladesh (approximately +6%). Male wages increased more in Odisha compared to other Indian states.

3.2 Buying inputs and selling products

In several locations, fewer respondents attempted to purchase inputs and sell products following lockdown measures, while simultaneously struggling to access transportation and inputs, and find buyers. This resulted in a substantial drop in income for many supply chain actors, with a trickledown effect across the supply chain.

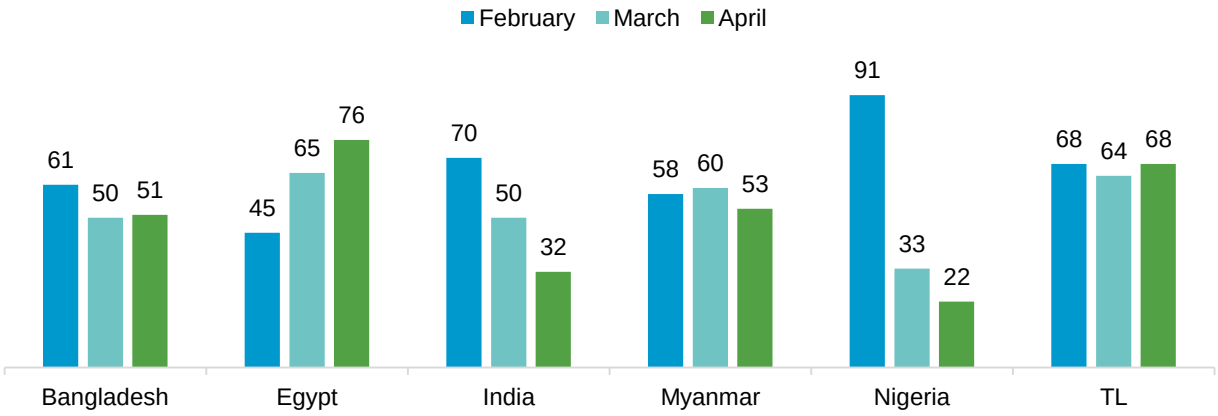

Figure 2. Share of respondents attempting to sell products in surveyed countries (%).

The share of respondents attempting to buy inputs and sell products decreased sharply in Nigeria and India and more moderately in Bangladesh and Myanmar. The share of respondents attempting to sell products dropped from 91% to 22% in Nigeria, and 70% to 32% in India (Figure 2). The lowest rate was recorded in the region of Assam with only 21% selling and products. Input purchasing followed a similar pattern. A drop-in market demand due to lockdown measures could have resulted in supply chain actors attempting to sell less and requiring less inputs. Upward trends were observed in Egypt and Timor-Leste. In Egypt, the demand for inputs typically increases at this time of year as the manufacture and trade of fish feed begins in late-February to early-March in preparation for the farmed fish growing season which starts in April.

Access to transport, inputs and buyers declined steeply from February to April except in Myanmar and Timor-Leste. Nigeria was the most severely impacted location with only 18% of respondents able to access transport (a decline of -82 pp), and just 13% able to access inputs and find buyers (a drop of approximately -85 pp). In Bangladesh, Egypt and India access to transport and inputs fell by 39 pp to 55 pp while the ability to find buyers declined by between 42 pp and 61 pp (Figure 3). Assam was more severely affected than other regions in India. Difficulties in accessing transport services impacted the ability to move products along the supply chain while the inability to find buyers likely resulted in loss of income.

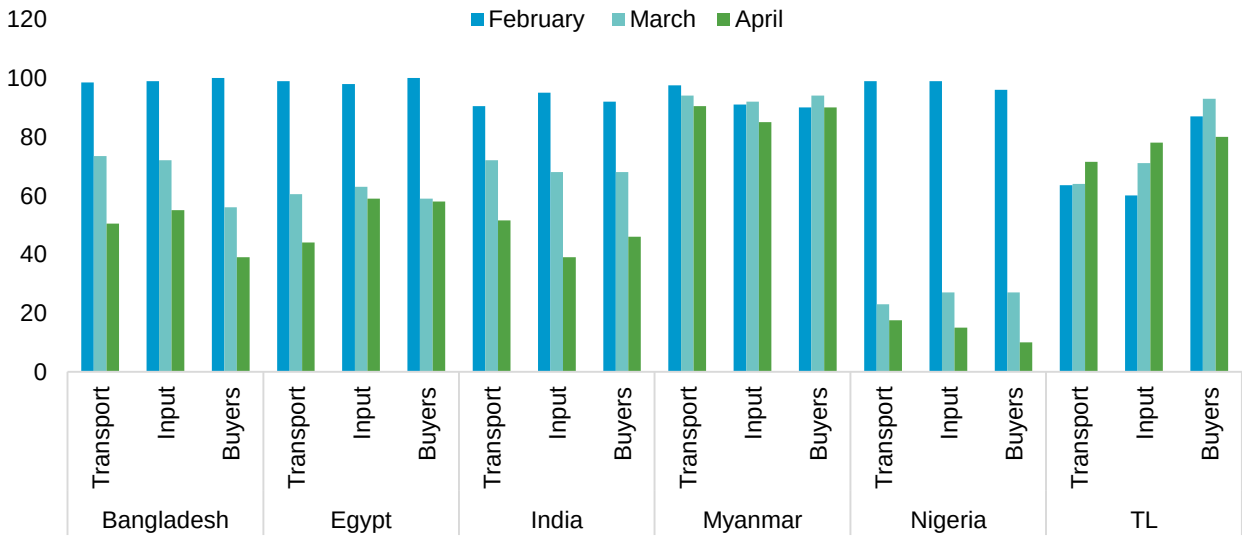

Figure 3. Share of respondents able to access inputs, access transportation, and find buyers in surveyed countries (%).

The share of respondents selling and purchasing products online increased in Myanmar and India. Specifically, more farmers sold and purchased products online in Myanmar in March/April compared to February (+24 pp) while hatcheries in India increased their online sales (+45 pp). In Andhra Pradesh, the share of pelleted feed sellers and fish traders purchasing inputs online increased by 15 pp and 40 pp respectively during these months.

4. Impacts by supply chain segment

4.1 Hatcheries

Production of hatchlings fell sharply in April, as compared to March, in several countries, at a time of year when production would usually be ramping up for the onset of the monsoon season. Hatchling production completely halted in Odisha (India), decreased by an average of 77% in Bangladesh and Myanmar in comparison to March and declined by an average of 25% in Nigeria in March/April in comparison to February. In contrast, Assam hatcheries did not produce anything in February of March but had a surge in production in April.

Sales of fry and fingerlings were also strongly impacted in April in most locations surveyed. Sales increased in all countries except in Nigeria in March but came to a halt in Odisha (India), and decreased by 97% and 63%, respectively, in Myanmar, and by 84% in Nigeria in April. In Bangladesh, sales remained relatively stable in April, but during a period of the year when demand would usually be increasing. Egypt proved an exception, with the volumes of sales increasing 83% from March to April, in line with rising temperatures that signal the start of the main tilapia growing season. There was no clear trend in the price of fry over this period, which varied by species and among countries, increasing in some and falling in others.

4.2 Feed mills

Procurement of raw materials by feed mills declined sharply in India and Nigeria between February and April but increased in Myanmar and Bangladesh. Procurement fell by around 64% in India and Nigeria but increased more than threefold in Myanmar and sixfold in Bangladesh compared to February. Assam was the worst hit region in India with no feed procured and all surveyed feed mills (n=5) stopping their activity in April while Odisha experienced a 47% decrease in volumes procured.

The volume of feed manufactured fell in India and Myanmar but increased in Bangladesh and Egypt. Feed mills in India and Myanmar manufactured 46% and 28% less feed in April compared to February. Egyptian feed mills sustained continuous increases in both March and April due to the beginning of the farming season. In India, feed mills in Assam were the most heavily affected with manufacturing coming to a halt in April, while Odisha was the least affected (-7%).

Feed mills that remained operational increased their procurement of raw materials and sustained a high demand for inputs and relatively good access to transport across all months. At least 75% of feed mills attempted to buy inputs in Myanmar and Bangladesh and 67% to 100% were able to access inputs and transportation in April. On the other hand, only 25% to 50% of feed mills attempted to buy inputs in India and Nigeria in April (-50 pp and -75 pp respectively) and transportation.

4.3 Feed sellers

The quantity of non-pelleted feed ingredients (rice bran, oil cake, and maize) sold fell dramatically in India and Bangladesh. Sales of these feeds in April fell by 95% in India, as compared to March and 83% in Bangladesh as compared to February (Figure 4). Sales in Assam and Odisha increased in March due to the beginning of the farming season but plummeted in April with sales completely halting in Assam. Feed sales in Andhra-Pradesh and Bangladesh were already decreasing in March and continued their decline in April. Overall, the gross revenues earned by non-pelleted feed sellers dropped by 89% between February and April, even as sales prices increased by 13% in Bangladesh and 17% in India.

Demand for pelleted feeds also slowed significantly in most locations. In April, pelleted feed sales halted completely in Nigeria, and fell by 60% in Myanmar, and 33% in India compared to February. Patterns varied across the Indian states included in the survey. From February to April, sales increased by 24% in Bangladesh, and jumped 3000% in Egypt with the start of the farming season. Downward trends in sales were associated with a drop in feed sellers attempting to sell products (-34 pp) and, among those who attempted to sell, a decline in access to transport (-20 pp) and a growing inability to find buyers (+42 pp).

Pelleted feed prices declined strongly in Egypt and increased in India while Bangladesh and Myanmar demonstrated very minor fluctuations. Between February and April, prices increased by 21% India and decreased by 30% in Egypt. In Assam (India), prices remained relatively stable in contrast to the other two Indian regions and Odisha recorded the highest increase. In both India and Myanmar, prices were highest in March before declining in April. Prices tended to increase in locations where sales decreased and vice versa.

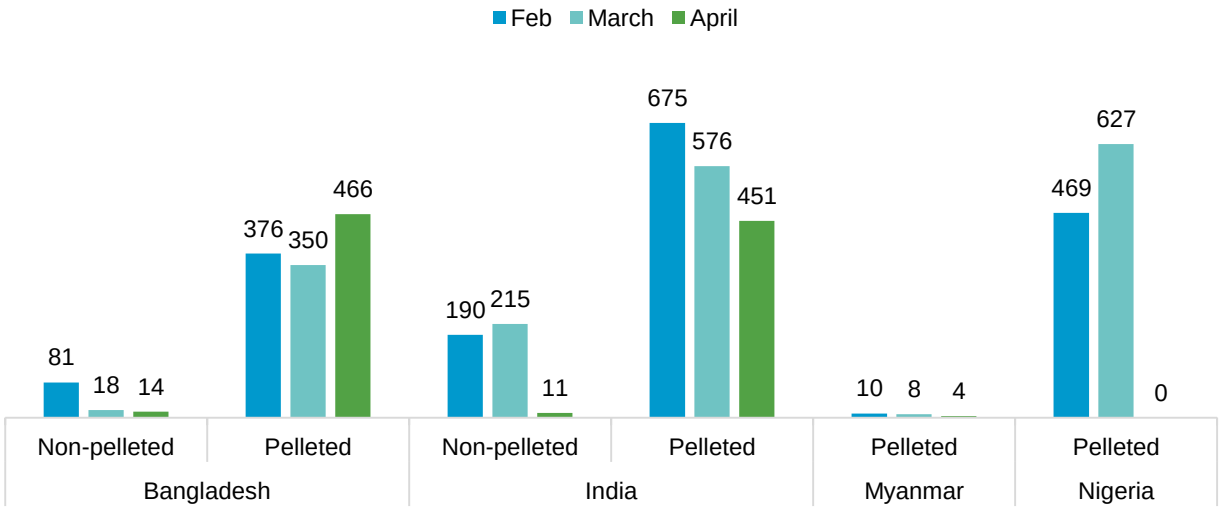

Figure 4. Non-pelleted and pelleted feed sales in surveyed countries, excluding Egypt (tonnes).

4.4 Farmers

4.4.1 Quantity and value of sales

Big drops in fish and shrimp sales were recorded in Nigeria and India, while sales increased in Bangladesh and Egypt. Compared to February, sales of fish and shrimp by farmers decreased by 99% in Nigeria in April and by an average of 56% in India in March/April. Sales increased by 58% in Bangladesh and 983% in Egypt in April due to the farming season. Myanmar showed more fluctuating trends as sales peaked in March but went back down in April. All three Indian regions followed strong declining trends in March, but sales increased again in Odisha in April while they remained low in Assam and Andhra Pradesh which suffered the strongest overall decline (-87%).

In the three countries where sales increased, the share of farmers attempting to sell products remained relatively stable and at least 60% of respondents were able to find buyers. On the other hand, in locations where sales decreased, approximately 22% of farmers were able to find buyers and the number of farmers attempting to sell products generally also decreased. Two outliers were the state of Odisha and Assam – sales in Assam decreased whereas the number of farmers attempting to sell slightly increased and vice versa in Odisha.

The average sales value for farmed fish declined sharply in Myanmar and more moderately in all other countries in March/April. By April, prices had declined by 28% in Myanmar and 4%-8% in Nigeria, Egypt, and Bangladesh. On average, India recorded a 12% price drop in March/April following a strong decrease in March due to plummeting shrimp prices in the state of Andhra Pradesh.

4.4.2 Input procurement

Procurement of feed and seed increased in Egypt, Myanmar, and Bangladesh but decreased in India and Nigeria. In April, farmers in Myanmar and Egypt increased their feed procurement by more than 250% while Bangladesh recorded a more modest 17% increase in comparison to February. During the same months, Indian and Nigerian farmers decreased their procurement by 54% and 75% respectively. Andhra Pradesh was less affected than the two other Indian states, with a 34% decrease. Seed procurement followed a similar trend but particularly increased in Bangladesh after a drop in March, while no seeds were procured in Nigeria in March/April. Feed and seed procurement tended to increase in locations where fish sales increased and vice versa.

The share of farmers attempting to buy inputs Between February and April, declined strongly in Nigeria, and fewer were able to access inputs in India. In April**,** only 25% of farmers were able to access inputs in India (-70 pp compared to February). The state of Andhra Pradesh was least badly affected and sustained the highest levels of procurement. In Nigeria, approximately only 25% of farmers attempted to purchase inputs in March/April (-63 pp compared to February).

Feed prices paid by farmers increased in Egypt and India, decreased in Myanmar and Nigeria and remained relatively stable in Bangladesh. By April, feed prices had increased by 56% in Egypt and an average of 10% in India in March/April while prices fell by around 14% in Myanmar and Nigeria. Price fluctuations were observed in Assam and Andhra Pradesh while Odisha sustained a continuous price increase.

4.4.3 Fisheres

Most fishers in the sample had a boat (86%) with an average size of 8 meters and a 16-horsepower engine. Across all months, fishers in the sample mainly conducted their activity in freshwater environments (58% on average).

Big drops in fish landings and sales were reported in most countries in March and April. This reflects a combination of the effects of Covid-19 impacts and seasonal fishing bans implemented in India and Bangladesh during this period. Correspondingly, the most severe declines in fish landed were observed in Bangladesh in March/April (on average -97% compared to February) and India (-89% in March and no fish landed in April) while in Myanmar, fishers landed 33% less on average. In Nigeria, fishers landed on average 375% more fish in March/April than in the previous month, but quantities remained relatively low with an average of 190 kg landed. Nevertheless, 40 kg less fish was caught in April compared to March, possibly forecasting a declining trend. In all countries, fish sales followed a similar trend to fish landed. Overall, fisher income dropped by 77% in March and an additional 68% in April.

The quantity of fish eaten per fisher household decreased in March or April in three out of five countries, while the share of catch consumed increased in most countries. The quantity of fish eaten decreased by around 33% in India and Bangladesh in March/April due to the drop in the quantity of fish landed, but households consumed much more from their own catch in relative terms. The share of fishers attempting to sell products decreased sharply in both countries. Nigeria was the only country in which the share of catch consumed decreased (-20 pp) as fish consumption increased in March/April compared to February.

In most countries, fishers did not report difficulties finding transportation or buyers in March and April, but far fewer of them attempted to sell products. This was most noticeable in Bangladesh and India, where the quantity of fish landed plummeted, and only around 3% of fishers attempted to sell in April. Nigeria was one of the only countries where fishers' ability to find transportation and buyers significantly declined in April compared to February (-75pp).

4.4.4 Processors

The quantity of fish processed and sold declined in all countries where processors were present. In April, the quantity of fish processed and sold declined by around 86% in Nigeria/India and around 75% in Myanmar/Bangladesh compared to February (Figure 5). As a result, processors experienced an 80% income drop between February and April. Most processors were driers and smokers while a few fermented, salted, and filleted. The recorded drop could be linked to input access, associated with the reduction in fishing activity in these months, noted above, or sales difficulties. Only 33% and 50% of processors stated they were able to access inputs and transport in April, versus 100% in February, while 40% stated they were able to access transport for sales and find buyers versus 94% in February. Simultaneously, around 35% attempted to buy inputs and sell products in April versus 82% in February, possibly due to a lower market demand.

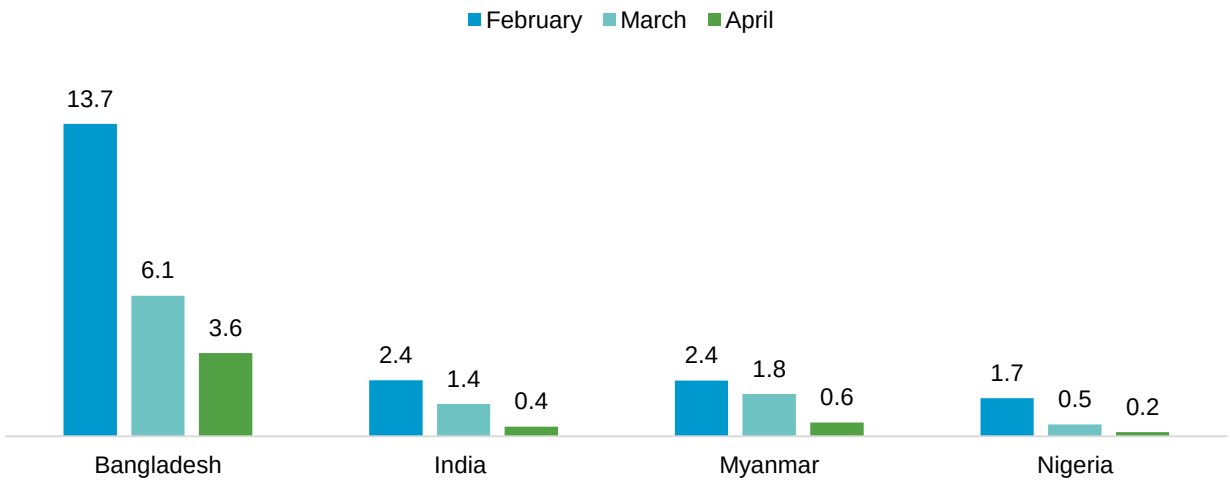

Figure 5. Processed fish sales in surveyed countries (tonnes).

4.4.5 Traders

The quantity of fish and shrimp sold by traders declined in all countries except Myanmar and Timor-Leste. Quantities sold declined by 76% and 64% in Nigeria and India, and approximately 38% in Egypt and Bangladesh, but increased by 39% in Myanmar and 16% in Timor-Leste. In absolute terms, farmed fish sales by surveyed traders declined the most, with a 793 ton drop in April (excluding Myanmar), while in relatively terms, marine fish sales declined the most over this period (-82%), in reflecting the closure of the fishing season in several countries. In India, Assam was one of the worst hit regions, with all traders halting their activity in April. As a result of the drop in sales, average trader income decreased by 59% between February and April (excluding Myanmar).

A decline in access to raw fish, and a difficulty finding buyers may have contributed to the decrease in sales. Overall, 55% of traders attempted to access inputs and 65% attempted to sell products in April, a drop of approximately 26 pp compared to February. Bangladesh, India and Nigeria experienced large drops in respondents attempting to trade. Accessing transportation for sales did not seem to be a major issue for traders except in Nigeria where only 25% were able to access transportation in March, and in Timor-Leste. In addition, traders in Nigeria and Bangladesh faced a growing inability to find buyers in April while traders in Myanmar and India struggled more with accessing inputs.

Overall, fish and shrimp prices decreased in all countries except Nigeria while Myanmar showed mixed trends. Prices fell by 40% in India after peaking in March, 28% in Bangladesh, and around 15% in Egypt and Timor-Leste, but increased by 6% in Nigeria between February and April. In Myanmar, marine fish prices dropped by 55% in March and slightly recovered in April while farmed fish and freshwater fish prices increased by 10% and 7%, respectively in April. Farmed fish generally experienced the largest price changes across all countries, except in Bangladesh where freshwater prices declined more. In India, farmed fish prices decreased most drastically in Andhra Pradesh with a 62% decline versus a 5% decline in Odisha between February and April.

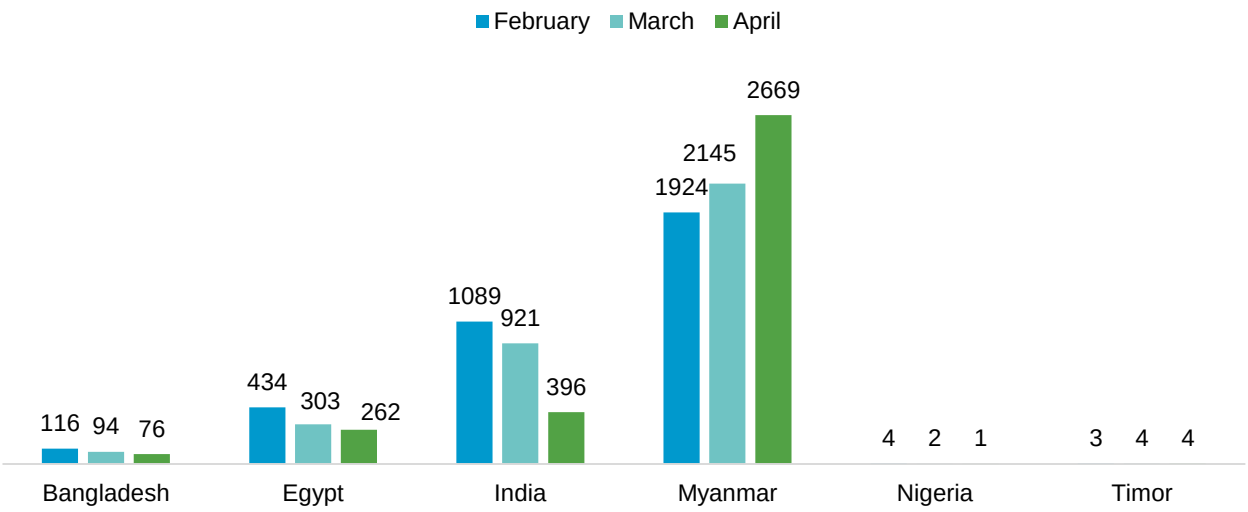

Figure 6. Fish and shrimp sales amongst traders in surveyed countries (tonnes).

4.4.6 Retailers

Sales of fish and shrimp declined in most countries across all fish types. Between February and April, overall sales declined by 99% and 84% in Nigeria and India respectively, 36% and 46% in Egypt and Bangladesh and 4% in Myanmar (Figure 7). All three Indian regions recorded major sales declines ranging from 80% in Andhra Pradesh to a complete halt in retailer activity in Assam in April. In Nigeria, more freshwater fish was sold in March/April compared to February, but quantities remained relatively low with an average of 40 kg sold and declines were observed in April compared to March. A similar pattern was observed in Myanmar for freshwater fish. Myanmar was the only country to record a 30% surge in farmed fish sales in April compared to February following a drop in March.

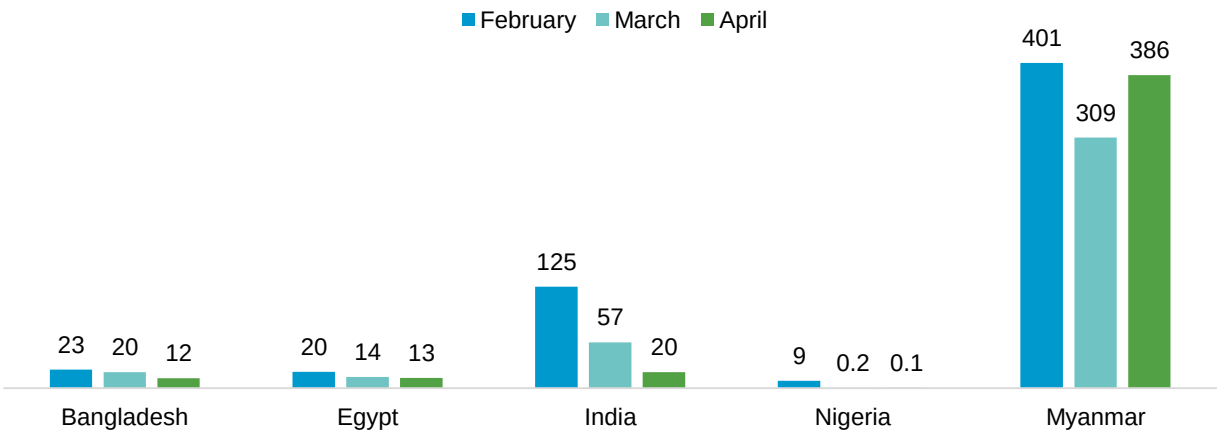

Figure 7. Fish and shrimp sales amongst retailers in surveyed countries (tonnes).

In most countries, retailers faced major difficulties in accessing fish and transportation, causing less availability and diversity of products to sell. In Egypt, Nigeria and Bangladesh, demand for inputs remained relatively high but retailers increasingly struggled with accessing fish and transportation. Retailers faced equal difficulties in Egypt and Nigeria in finding buyers and accessing transport. In Bangladesh, the growing difficulty in accessing inputs was possibly behind declining sales, as access to transport and buyers remained stable. In India, most retailers were able to access inputs and transport but much fewer of them attempted to buy inputs or sell products in April compared to February (-68 pp) possibly due to a plummeting demand. Access difficulties related to lockdown measures that reduced opening hours, as well as a general reduction in disposable income may have all contributed to this drop. In Myanmar where retail was the least affected, access to inputs and transportation remained stable, as did the share of retailers wanting to buy inputs/sell products.

Overall, prices of fish and shrimp sold by retailers increased in Bangladesh, Egypt and India, and decreased in Nigeria and Myanmar in April. Between February and April, prices increased by 53%, 24% and 13% in Bangladesh, India, Egypt respectively, decreased by 26% in Myanmar and an average of 10% in Nigeria in March/April. Prices increased or decreased consistently per country across all surveyed fish categories except for farmed fish in Myanmar and Nigeria.

5. Policy recommendations

Based in the findings above, we identify policy responses and aid requirements, centered around three main axes: providing financial support to supply chain actors, assuring a smooth flow of products and inputs, and assuring a consistent demand.

Provide financial support to supply chain actors. Many supply chain actors lost a substantial amount of income in March and April, with some earning half of their usual revenues or even less. Fishers, farmers, and other businesses throughout the fish supply chain would benefit from financial support to maintain dwindling cash flows and provide stimulus for restarting temporarily stalled operations. This stimulus would have flow through effects to other value chain segments when inputs and services are purchased from other actors further upstream in the chain. Examples of support include tax holidays, rebates on utility bills, social assistance such as direct cash transfers, and low interest loans. These should not only be targeted at producers, but to all the businesses essential for ensuring the smooth operation of aquatic foods supply chains.

Assure smooth flows of products and inputs. Nearly all actors faced significant difficulties in accessing inputs and transport services during March and April. Such difficulties can be mitigated with simple measures.

- Provide training and resources to ensure safe, hygienic operation of businesses throughout the fish supply chain to promote a constant flow of production.
- Restrictions on imports of production inputs (e.g. feed, feed ingredients) and exports of fish should be avoided to help prices remain stable.
- In any future lockdowns, fishery supply chain actors should be designated as essential workers at all administrative scales (national to local), and access to inputs and markets need to be guaranteed by continued free movement of commercial goods vehicles.

Assure constant demand. Low market demand originates from a general drop in income as well as lockdown-related impacts.

- Unconditional cash transfers to vulnerable groups can stimulate demand and increase fish consumption, as well as helping to safeguard nutritional status
- Governments and aid agencies can work to include fish or fish-based products in food aid packages to deliver micronutrient-rich foods directly to vulnerable populations and support financial recovery among producers and suppliers of these foods.
- Now is a good time to upgrade market infrastructure and enforce better hygiene practices in wholesale and retail wet markets, so fish can be sold in a safe and clean environment.

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RESEARCH PROGRAM ON Fish

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About FISH

The CGIAR Research Program on Fish Agri-Food Systems (FISH) is a multidisciplinary research program. Designed in collaboration with research partners, beneficiaries and stakeholders, FISH develops and implements research innovations that optimize the individual and joint contributions of aquaculture and small-scale fisheries to reducing poverty, improving food and nutrition security and sustaining the underlying natural resources and ecosystems services upon which both depend. The program is led by WorldFish, a member of the CGIAR Consortium. CGIAR is a global research partnership for a food secure future.

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