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Impacts of COVID-19 on Aquatic Food Supply Chains in Odisha, India

February – July 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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Front cover, Soudamini, and Manorama Mohapatra

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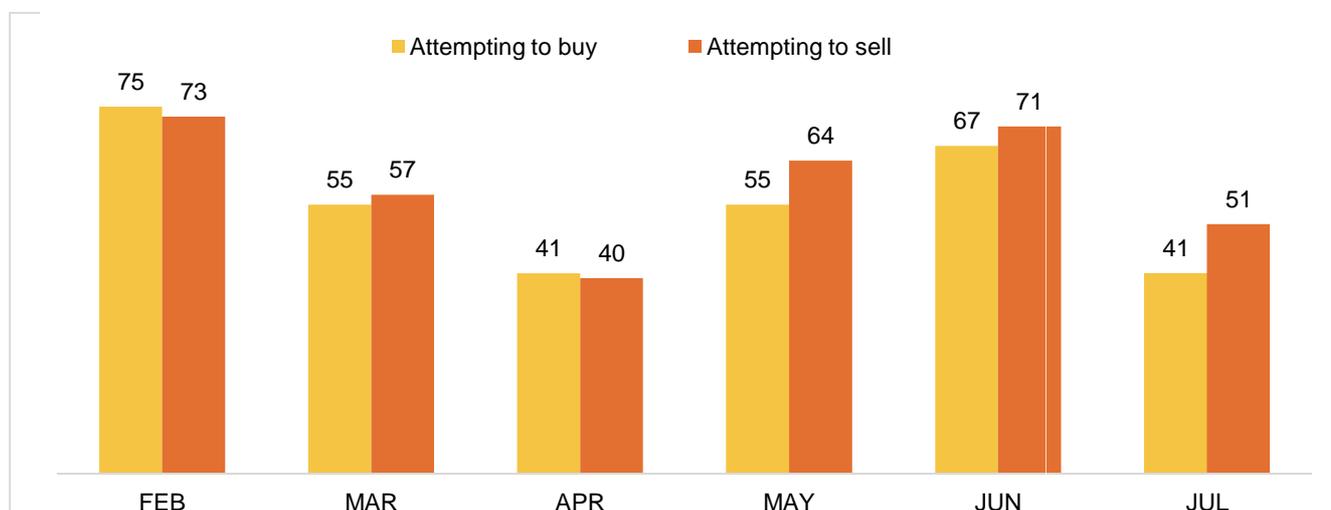
Overview

We conducted a monthly phone survey with fish supply chain actors in Odisha to assess the impacts of COVID-19 on the availability and price of aquatic foods and production inputs. Respondents answered questions about their activity between the months of February and July 2020. The sample totaled 104 respondents, comprised of the following: feed mills (2), fish hatcheries (10), feed sellers (15), fish farmers (37), fishers (17), fish processors (3), fish traders (8), and fish retailers (8), with the majority of respondents being male. The divisions covered were the Central Division (69%), Northern Division (17%) and Southern Division (14%). Districts with the most respondents were Jagatsinghpur (21%), Puri (16%), Jajpur (7%), Sambalpur (6%), Khordha (5%), Mayurbhanj (5%) and Bhadrak, Kendrapada, Angul, Balangir, Ganjam, Kalahandi (4% each). A complete summary of survey results can be accessed [here](#).

Key findings

The share of respondents attempting to buy or sell inputs followed a 'V shaped' curve between February and June, before falling again in July (Figure 1). The percentage of respondents who attempted to buy inputs dropped from 75% in February to 41% in April, recovered to 67% in June, and then fell back sharply to 41% in July. The share of respondents attempting to sell inputs followed a similar trend, falling from 73% to 40%, before jumping to 71%, and dropping back to 51%, in July, suggesting a declining demand, possibly due to the prolonged or intensified impacts of COVID-19.

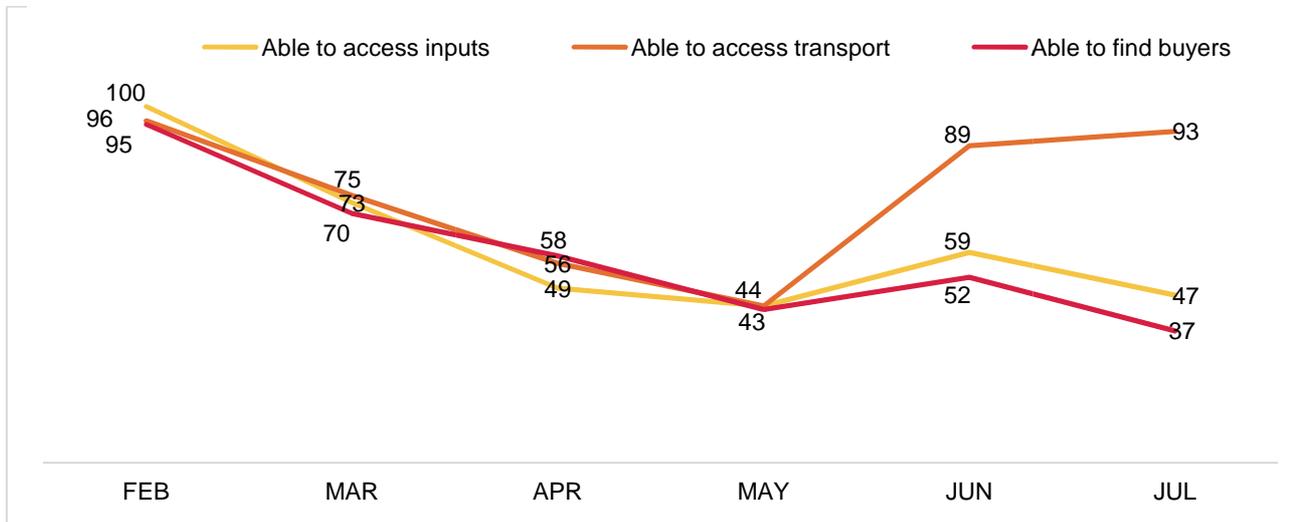
Figure 1. Respondents attempting to buy or sell inputs, by month (%)



The percentage of respondents who were able to access inputs and transport on all occasions required followed a somewhat similar pattern to the one described above, trending steeply downwards between February and May, before climbing somewhat in June, only to fall back in July (Figure 2). The share of respondents able to access inputs, transport or, buyers when required all plunged from close to 100% in February to around 43% in May. Access to transport improved significantly in June and reached 93% in July. The share of respondents able to access to inputs and buyers rallied slightly in June, but

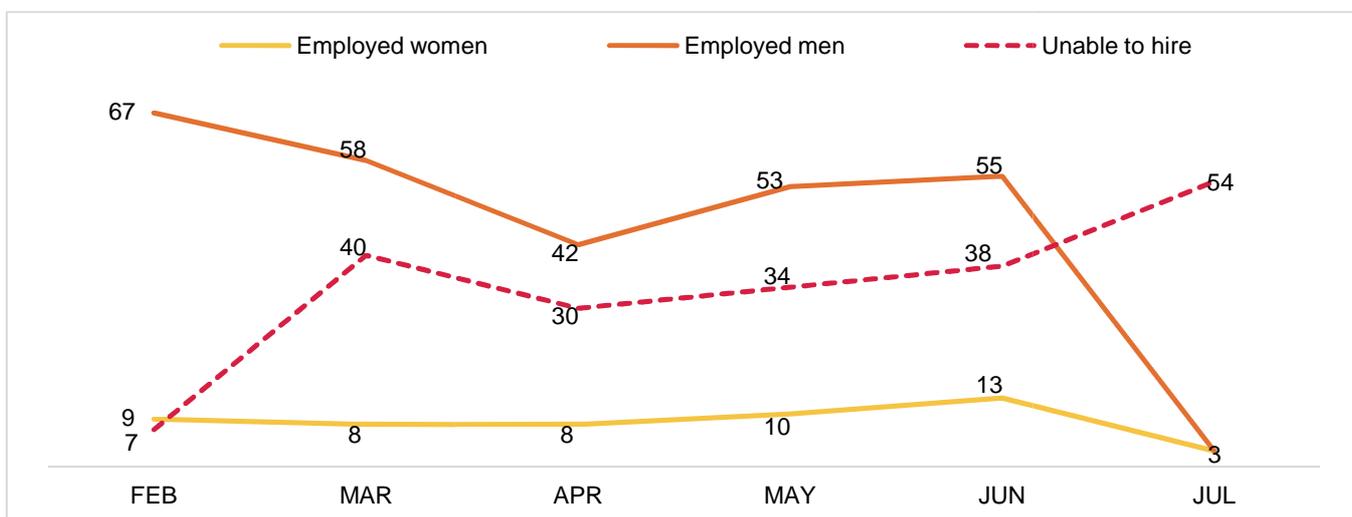
fell to 47% and 37%, respectively in July, suggesting that low demand, rather than logistics was the key challenge at during this period.

Figure 2. Respondents able to access inputs, transport, or buyers when required, by month (%)



Employment followed a somewhat similar pattern (Figure 3). The share of respondents employing male daily labor fell from 67% in February to 42% in April, rising gradually back to 55% by June, before declining very sharply to just only 3% in July. The share of businesses employing female casual workers remained low but stable from February to May at around 9% before rising slightly to 13% in June, and contracting sharply to 3% in July. The share of respondents who reported being unable to hire daily labor rose from 7% in February to 40% in March, plateauing at between 30-40% until June, before climbing further to 54% in July. These results suggest that workers’ ability to find employment and employers’ ability to find workers were both impacted by the pandemic, and this situation worsened significantly in July.

Figure 3. Respondents employing women or men casual workers, or unable to hire casual workers, by month (%)



In May, we began asking respondents whether they had experienced delays in accessing inputs or selling products, or if they had reduced the quantity of inputs used or experienced a reduction in the quantity of products sold, as compared with their usual expectations. In May, 66% of respondents reported that they had experienced delays in selling products. The situation improved slightly in June as this number fell to 50%, but worsened again in July, climbing back to 68%. The share of respondents who experienced reduced sales volumes or delays in accessing inputs, as compared to normal expectations, followed a similar pattern. The share of respondents who reduced the quantity of inputs purchased compared remained stable but high during these months at around 68%, reflecting slow demand and reduced levels of production compared with business as usual.

Starting in May, we began to ask respondents if they had earned sufficient income to pay for their household's weekly expenses, and how the quantity of food they had purchased in the past month compared to usual. In May, less than half of respondents (48%) reported earning sufficient weekly income to cover household expenses during the past month. This indicator improved to 55% in June, before contracting sharply to 30% in line with the trends reported above. Somewhat surprisingly given this pattern, the share of households purchasing less food than normal dropped from 46% in May to 5% in July, suggesting a substantial improvement in food security during these months.

From May onwards, we also asked respondents if they received any form of assistance and whether they had travelled for more than one mile from home during the past month (an indicator of the severity of movement restrictions). 9% of respondents reported receiving assistance in May, citing the government as the main source. By July no respondents were receiving any form of assistance. In contrast, the share of respondents travelling more than one mile from home was high in May, standing at 98%, before falling to 70% in July. This finding aligns with results presented above suggesting a reduction in economy activity in July, perhaps due in part to people staying home to avoid infection.

Hatcheries

80% of hatcheries operated in February and March, but 60% closed in April and 30% in May, with respondents citing temporary suspension of operations due to COVID-19 as the main cause. Other reasons reported in May included related issues such as input suppliers being closed or out of stock, low demand, and restrictions on road movement. 40% of hatcheries remained closed in June and July, due primarily to temporary closures related to COVID-19 and 'other' reasons. The average number of days per month that hatcheries operated fell from 15 in February/March to 4 in April/May, recovering to 12 days in June before falling back to 9 in July.

Between February and March, the total quantity of hatchlings produced by surveyed hatcheries increased from 2 million to 17 million. Hatchling production ceased entirely in April but rose steeply thereafter to peak at in June at 82 million, before plummeting to 15 million in July. The majority of hatchlings produced and sold were rohu, followed by catla and mrigal.

Feed Mills

We surveyed two feed mills. Both operated in February and March and one temporarily halted operations in April, citing reasons related to COVID-19. The number of days operated fell from 24 per month in February to 9 per month in April. No observations were recorded for feed mills from May onwards.

Raw material prices remained stable between February and April, averaging just under INR 20,000/ t. The total quantity of materials procured by surveyed mills dropped by around half over this period, falling from 700 t to 372 t. The total value of raw materials purchased followed a similar trend. In contrast, the total quantity of feed manufactured stayed relatively constant from February to March, between 372 t and 400t. The average sales price of manufactured feed also remained steady at around 28,000/t. The main feeds produced were floating pellets with a crude protein content in the 21-28% range.

Feed Sellers

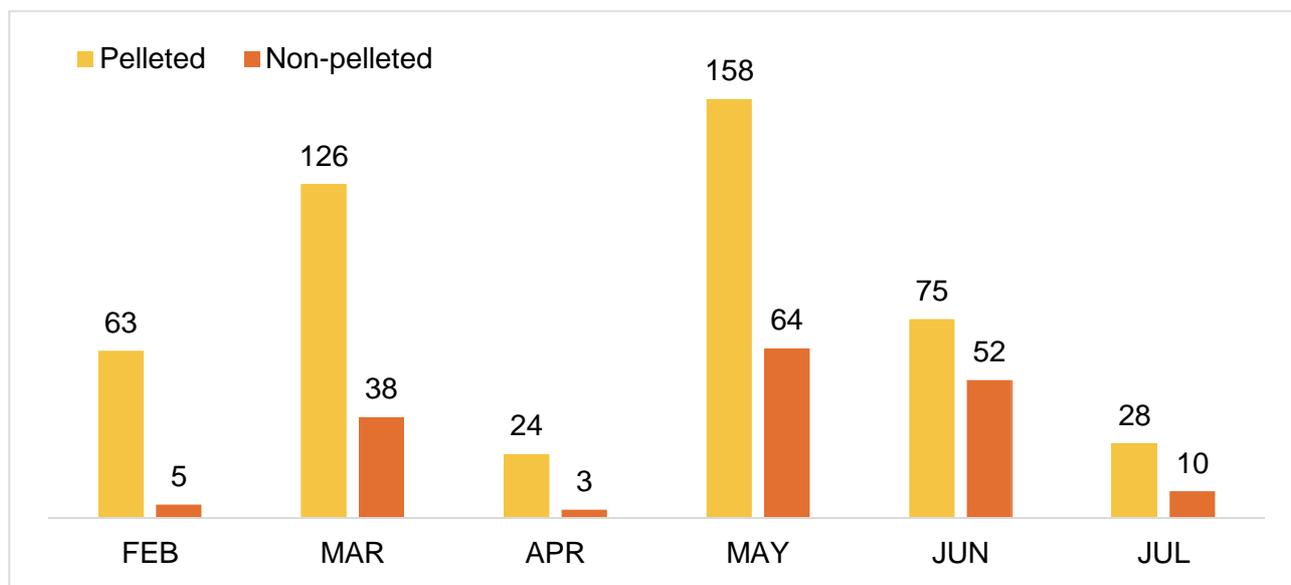
We surveyed two sets of feed trading businesses; pelleted feed sellers, and non-pelleted feed sellers. Non-pelleted feeds sold included peanut oilcake and mustard oil cake. Floating feeds accounted for the majority of feed sold.

Almost all pelleted feed sellers operated over the survey period, with the exception of April when 43% suspended operations temporarily due to COVID-19 and transport restrictions, and July when 57% paused operations, citing COVID-19 as the cause. The average number of business day pelleted feed sellers operated fell from 27 days/month in February to 9 days/month in April, rising to 15 days in June before falling to 7 in July. Most non-pelleted feed sellers operated in February and March, but only 50% continued operating in April. The situation seemingly improved in May and June, with 75% and 63% operating, but worsened considerably in July when only 12% of businesses remained open. Respondents cited COVID-19 as one of the main reasons for suspending operations, in all months except February. Lack of transport services and restrictions on road transport were also cited in April and May, during the 'lockdown' period. Accordingly, the average number of days that businesses operated fell from 21 days per month in February to one day in July.

The total quantity of both pelleted and non-pelleted feed procured by surveyed businesses trended sharply downward between May and July. The total quantity of feed purchased by pelleted feed sellers sharply fell from 276 t to 32 t in this period, while drop in quantity of non-pelleted feed procured was less pronounced, falling from 90 t and 20 t.

The average sales price of non-pelleted feeds increased remained fairly steady from February to May at between INR 30,000-35,000/t but increased somewhat thereafter to reach INR 40,000/t in July. The sales price of floating pelleted feeds followed a similar pattern, hovering around INR 41,000/t in from February to May, and rising in June and July to reach INR 46,000/t.

Figure 4. Total quantity (t) of pelleted* and non-pelleted feed sold by feed sellers, by month



* Excluding sales of 25-28% protein sinking feed.

The total quantity of non-pelleted feed sold rose from 5 t to 38 t, between February and March, dropping in April, to the same levels as February. Non-pelleted feed sales then peaked in May (64 t) before falling back 10 t in July. The pattern displayed by pelleted feed sales is very similar if 25-28% protein sinking feeds, for which very high sales were reported anonymously in April, are excluded; climbing from 63 t in February to 126 t in March, dropping to 24 t in April, jumping to 158 t in May and declining sharply to 28 t in July (Figure. 4).

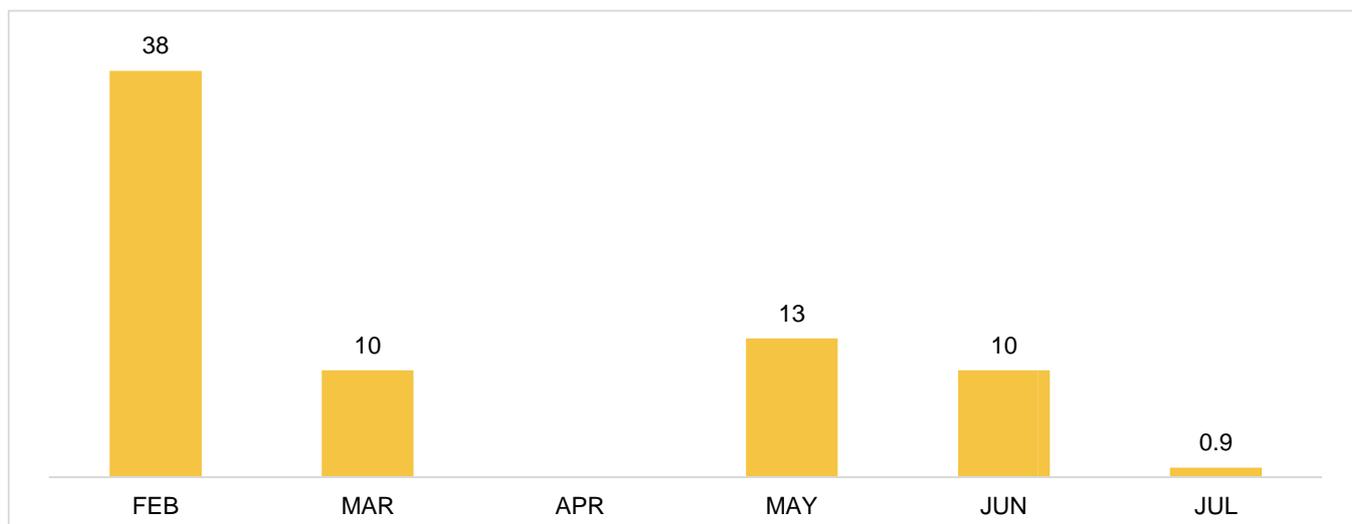
Fishers

Surveyed fishers were relatively evenly split between fishing in marine and inland environments, most importantly offshore marine fisheries, and in reservoirs. 94% fished with boats, averaging 11 meters in length. Over two-thirds of boats had engines, averaging 13HP each in size.

All surveyed fishers fished in February and March. 100% halted operations in April due to COVID-19, but 67% resumed fishing again in May and numbers fishing increased gradually to reach 100% in July. Accordingly, the average number of days fished per month fell from 19 days in February to zero in April, climbing back to 24 days by July.

The total quantity of fish landed and sold by surveyed fishers dropped from a peak of 39 t in February to 11 t in March (-70%), prior to business closures in April. When fishing resumed in May, the total quantity of fish landed rose to 14 t but then declined gradually to 1.6 t in July. Most fish were so quantity sold followed a very similar pattern to quantity landed (Figure 5).

Figure 5: Total quantity (t) of fish sold by fishers, by month



All fishers consumed part of their own catch in every month that they fished. Interestingly, the share of own catch reported as consumed by fisher households increased from 1% to 10% between February and July. The average quantity of fish reported as consumed by fisher households each month rose from 25kg to 50kg over this period.

Fish Processors

We interviewed 3 processors (fish driers). Two of them remained closed in February and March. In April, the Government granted permission for aquatic value chain actors, including fish processors, to continue their work while maintaining COVID-19 safety guidelines. Accordingly, the number of fish processors operating increased to 100%, but all quickly halted operations again in June and July, citing temporary closure due to COVID-19. In April, surveyed fish processors purchased 0.98 t of fresh fish and sold 0.48t of dried fish.

Farmers

Most surveyed fish farmers continued operating throughout the survey period. Only around 23% stopped operations in March and April. Among the farmers who paused their activities, most cited temporary closure due to COVID-19, and associated reasons, such as inability to hire transport, restrictions on road movement, and closure of input suppliers. 100% of surveyed farmers were operational from May to July.

Prices paid for feed by farmers were reported to fluctuate considerably over the survey period, displaying no clear trend. Unusually high sales of oilcake were reported in May. When these are excluded, the pattern of feed purchases by farms is similar to the trend in sales made by feed sellers. Total feed purchases by farms (excluding oilcake) declined from 117 t in February to 14 t in April, climbing steeply to 227 t in June, and then falling back to 23 t in July.

Fish seed procurement was highest in the months of February and March, when surveyed farms purchased a total of about 1 million pieces. The amount of fish seed procured fell

steeply to 142,000 in April, while the fish seed procurement prices shot up. Fish seed purchases climbed again in June to 808,000 fish, before dropping back quickly to 200,000 in July.

Rohu was the main species of fish sold, followed by catla. Reported sales of mrigal were unusually high in April. Excluding mrigal, fish sales followed a similar pattern to activity reported by other businesses; first dropping from 8t in February to 4 t in April, then rising to a high of 28 t in June before falling back again to just 2 t in July. Farmgate prices received by farmers started the survey period at around INR 150/kg, fell to INR 130/kg in April, and then climbed steadily to a peak of INR 167/kg in July.

Traders

All surveyed fish traders were operating in February. The number fell to 50% in March, but some reopened in April and May, when the share operating increase to 80%. All traders operated again in June. No traders were interviewed in July. Temporary suspension of activities due to COVID-19 was the most commonly cited reason for business closures, with logistical problems and closed fishing season and bad weather also cited.

Farmed fish were the most traded products by surveyed traders, followed by marine capture fish. The average sales value of farmed fish remained relatively stable, falling from INR 157/kg to INR 145/kg between February and June. In contrast, the total quantity of farmed fish sold by surveyed traders fell from 3.3 t to 1.1 t between February and March, and remained stable until May, before sharply climbing to 7 t in June. Rohu accounted for the bulk over sales over this period.

The total quantity of marine capture fish sold dropped from 20 t in February to 3.7 t in March and April, rebounding to 33 t in May. The marine fishing ban period in Odisha runs from 15th April to 14th June, so it is possible this fish originated from the West coast or elsewhere. No marine capture sales were made in June. Small mixed marine fish accounted for the bulk of sales.

Retailers

The majority of surveyed fish retailers remained open from February to June, with at least 60% operational in all five months. Respondents who reported suspending operations cited temporary closure due to COVID-19, logistics problems, and low demand as the main causes. 100% of retailers were operating by July. Accordingly, the average number of days retailers operated per month increased from 14 days in February to around 7 days in other months, and 25 days in July.

Farmed fish was sold in all months, while respondents reported selling only a small quantity of shrimp in February and March and freshwater capture fish in May and July. The average sales price of farmed fish remained stable, at between INR 159/kg and INR 179/kg. Farmed fish sales dropped by 65% between February and April, from 1.8 t to 0.6 t, but rose to 3 t in May and June, before peaking at 7.5 t in July. Rohu and catla made up the majority of farmed fish sold.

Recommendations

- Build awareness among aquaculture farmers, marine fishers and other supply chain actors on COVID-19 transmission and prevention measures and provide free health check-ups through medical mobile vehicles at fishing bases (e.g. ports) and markets.
- Raise awareness of hygiene, including good fish handling practices and safe fish production under healthy working conditions, incorporating health-screening protocols at every step.
- Include dried fish in safety net packages provided by the Supplementary Nutrition Program (SNP) under the Integrated Child Development Services (ICDS) of Women and Child Development Department to deliver nutritious foods to vulnerable consumers and products and support producers of aquatic food.
- Promote alternative income generating activities such as cash for work, particularly during seasonal fishing ban periods, to improve food purchasing capacity.
- Provide rapid access to emergency low-cost loans or cash grants for fish supply chain actors to help overcome immediate cash flow problems, and as seed money for investments to needed to upgrade and improve production practices and assets.
- Build consumer confidence through awareness programs, investing in improved fish storage and landing facilities, and maintaining hygienic fish handling practices.
- Raise awareness of how to use online procurement and marketing platforms and cashless transactions to facilitate ordering and direct marketing of production inputs and aquatic foods.



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