



November, 2021

# **COVID-19 impacts and adaptation in aquatic food supply chains in Nigeria**

## **One year into the pandemic**

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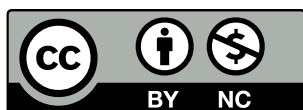
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# 1. Overview

In 2020, we conducted a bi-weekly phone survey, covering the period from February to November, with 86 fish supply chain actors in Nigeria, to assess the impact of COVID-19 on the availability and price of aquatic foods and production inputs (Middleton *et al* 2020). In 2021, we conducted a follow-up survey, by phone interviews in June recalling activities from March through May. Not all original respondents were available for a follow-up interview, so some new respondents were contacted. The 2021 sample comprised of the following: fish hatcheries (12), fishers (10), traders (7), retailers (9), fish processors (14), feed sellers (pellet) (12), feed mill (4), fish farmers (23).

COVID-19 cases in Nigeria peaked in June 2020, January 2021, and again in August 2021 (Dong *et al* 2020). The government responded to the pandemic by enforcing mandatory lockdown periods between March and October 2020, followed by relaxation of the restrictions between September and November 2020. Due to rising cases, lockdowns were re-introduced in December 2020, continuing through early 2021. As such, data from 2020 was collected during lockdown periods, whereas data from 2021 was collected in a post-lockdown period. Lockdowns included travel bans, which impacted on both import and exports as well as peoples' ability to travel for work and business purposes.

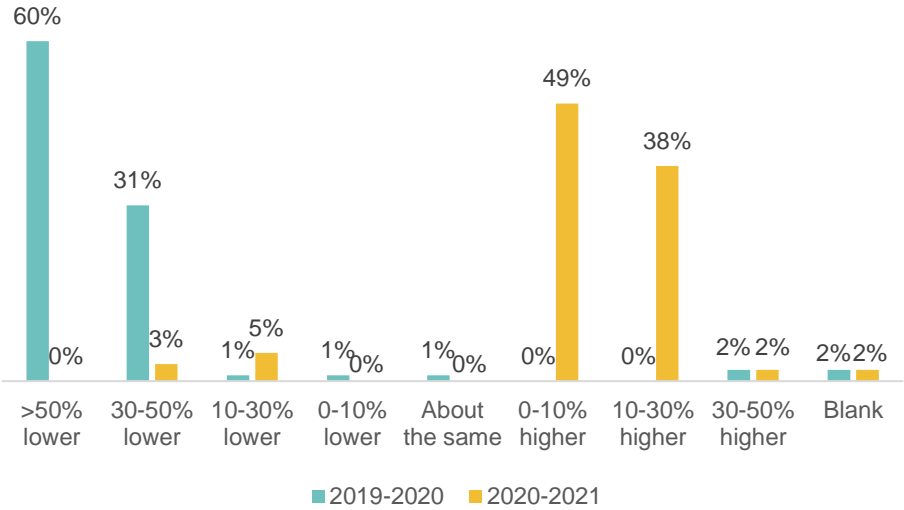
## 2. General Impacts

Despite lockdowns, all the respondents interviewed during 2021 were operational in the surveyed months.

We asked respondents about the value of their sales during 2019 (pre-pandemic) compared to those in 2020 (the first year of the pandemic), and how their anticipated sales for 2021 compared to sales in 2020. Almost all the respondents (93%) experienced a decrease in sales between 2019 and 2020. More than half of the respondents reported that sales had declined by more than 50%, while only 2% of farms reported that their 2020 sales were higher than in 2019 (Figure1).

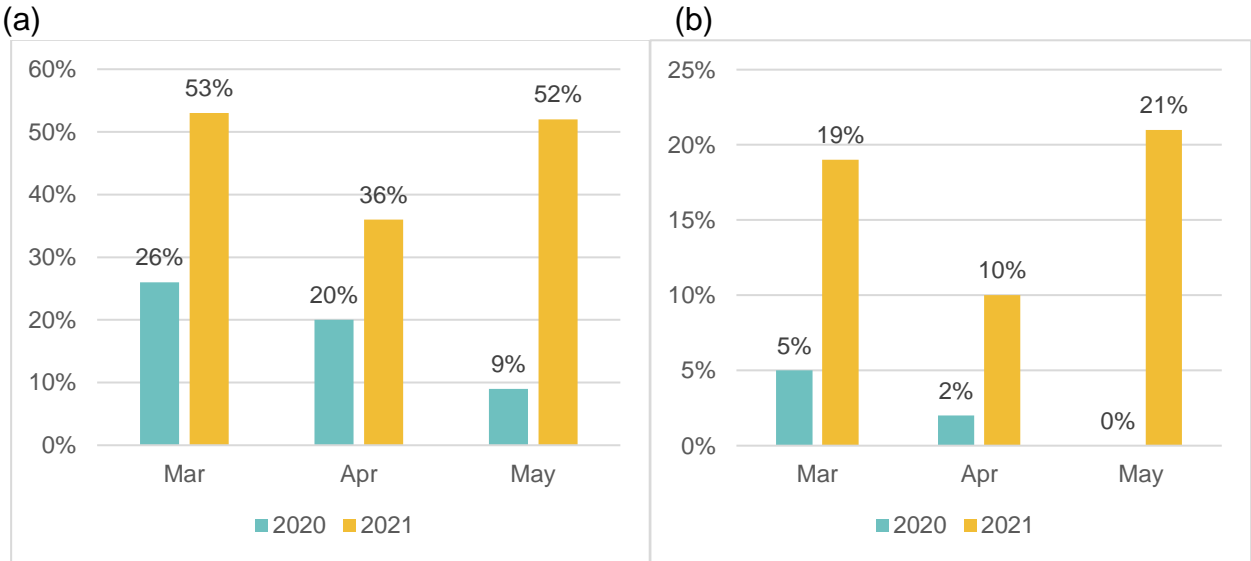
Based on anticipated sales volumes, business activity in 2021 appears to have stabilized somewhat. Only 8% of the respondents anticipated that their sales would be lower, while 89% believed that they would be higher compared to the previous period. This trend indicates initial hardship caused by the pandemic, followed by recovery in 2021 as evidence of resilience.

Figure 1 Change and anticipated change in value of sales from 2019 to 2020 and from 2020 to 2021, reported and predicted by the respondents.



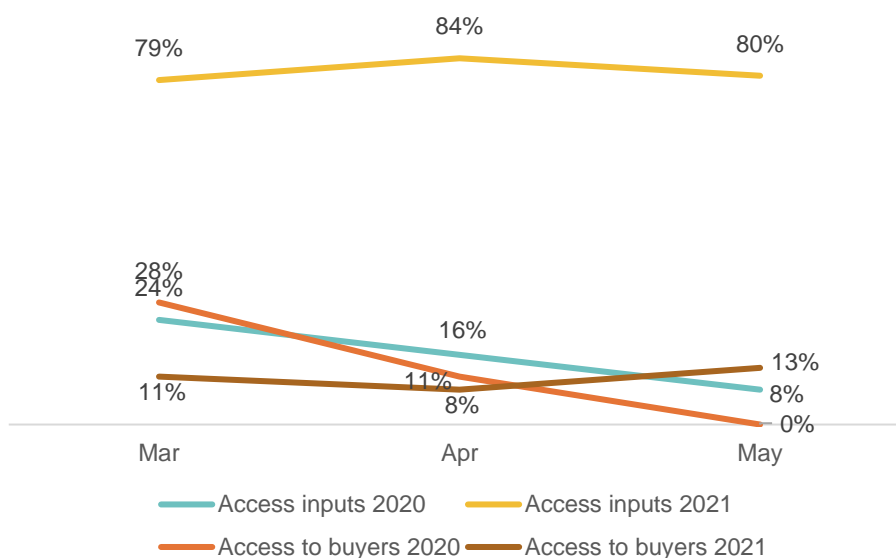
Employment in aquaculture value chains remained stable in both years, although slightly higher in 2021 compared to 2020, further indicating recovery. In 2020, the share of respondents hiring male daily labour during March-May decreased from 26% to only 9% (Figure 2a). In contrast, in 2021, almost half of the respondents were hiring male daily labour, suggesting that demand for labour was slightly greater due to higher levels of business activity. Similarly, the share of respondents hiring female labour during these months declined from 5% in April to 0% in May 2020, while it averaged at 17% in 2021 over the same period (Figure 2b). Vastly lower levels of female employment in 2020 may be due to the effects of lockdown, including increased household work or lack of childcare services.

Figure 2 Percentage of respondents hiring male (a) and female (b) for daily labour.



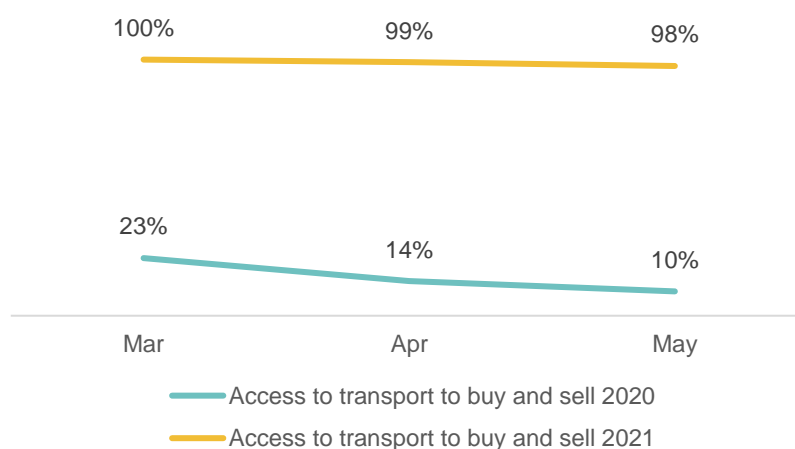
Access to inputs improved in 2021 compared to 2020, while access to buyers remained low (Figure 3). In 2020, the share of respondents able to access inputs whenever they attempted to do so fell from 24% in March to 16% and 8% in April and May, respectively. In contrast, in March 2021, respondents who were able to access inputs whenever needed ranged between 79% and 84%. The share of respondents reporting being able to find buyers on all occasions was 28% in March and 11% in April 2020, no data were reported for May 2020. In 2021, the share that was able to find buyers was on average 11%. This reflects an improved production, that was perhaps unsupported by markets further down the value-chain.

Figure 3 Percentage of respondents able to access inputs and buyers.



The percentage of respondents able to access transport whenever they wished to purchase inputs or to sell products was on average considerably higher in 2021, standing at well over 95% in all three months in 2021, as compared to an average of 16% in 2020 (Figure 4).

Figure 4 Average percentage of respondents able to access transport to buy and sell products.



The participants were also asked about their use of online platforms to sell their products and, generally, the use was higher in 2020 than in 2021. In March 2020, 3% of the respondents sold their products online, which increased by 13% in May. In comparison, only 3% or less used online platforms in March through May 2021, indicating that online platforms were seen as a short-term solution when other options were unavailable due to COVID lockdown measures.

The percentage of respondents with a sufficient weekly income was low in both years and decreased from 5% in May 2020 to 2% in May 2021 (May was the only month included in both survey rounds). Throughout both survey periods, of the majority of respondents (70% on average) bought less food than usual. The percentage of respondents who bought the same quantity of the food as usual improved from 6% in May 2020 to 27% in May 2021. This is evidence that food security was threatened during the pandemic, despite resilience business operations.

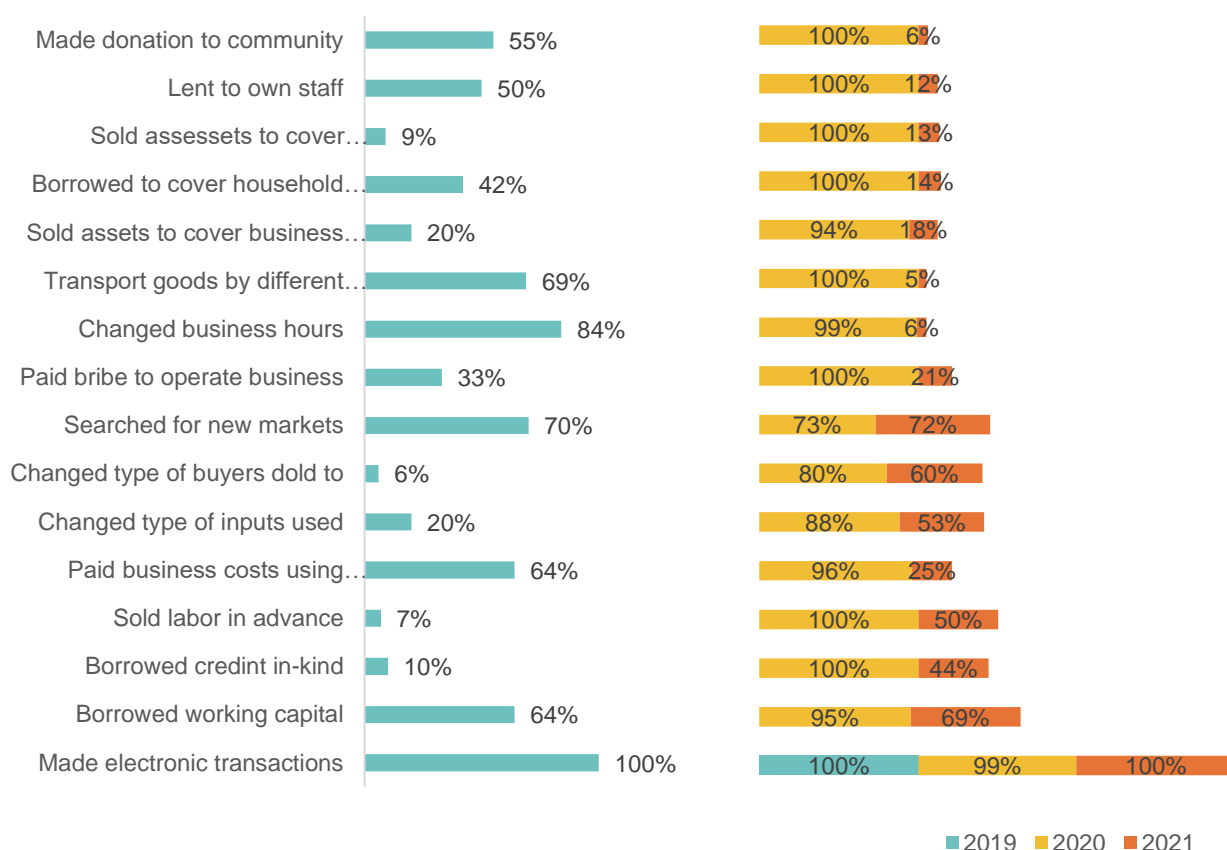
None of the respondents received assistance in May 2020 and May 2021.

### **3. Business adaptations to COVID-19**

We asked respondents about behaviours that we hypothesized might have been adopted as adaptations to COVID-19, and in which years from 2019 to 2021 they had practised them. Our interpretation of the results is that behaviours that began or increased sharply during 2020 are likely to be adaptations to COVID-19, whereas those already common in 2019 were pre-existing patterns of behaviour.

Many respondents appeared to have altered their behaviour in adaptation to new challenges posed by COVID-19, especially in 2020 (Figure 5). All respondents changed from cash to electronic transactions, although this trend began prior to the pandemic. Overall, 84% of the respondents changed their business hours, with 99% in 2020 and only 6% in 2021. Furthermore, a high number of respondents searched for new markets (70%), transporting goods by a different route (69%), or borrowed working capital (64%). Except for making electronic transactions, most of these behaviours were 0% in 2019, almost 100% in 2020, before they declined in 2021, indicating that respondents switched back to pre-COVID behaviour. For example, in 2020, all respondents lent to their own staff, made donations to the community, or transported goods by different routes, while on average only 7% of the respondents showed these behaviours. The ability to quickly change behavioural strategies when faced with limitations by the pandemic and lockdown mandates is an indicator of the resiliency of this system. Furthermore, it indicates social capital and network cohesion, where people were able to receive support from their community to continue their business.

Figure 5 Percentage of respondents who have shown the respective behaviours in the past three years (2019-2021).



## 4. Impacts by value chain segment

The following subsections detail changes in business operation occurring between March-May 2020 and March-May 2021, for surveyed businesses in seven segments of the aquaculture value chain.

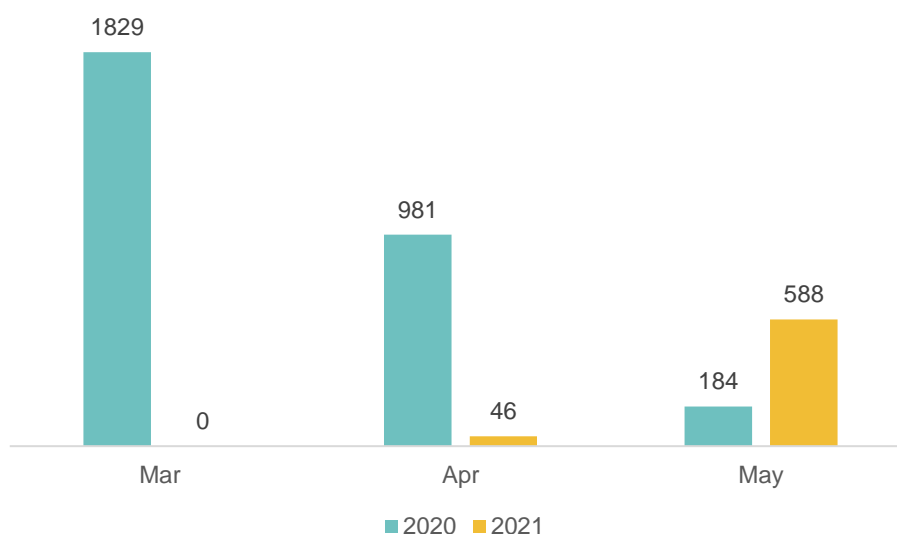
### 4.1 Feed Mills

All surveyed feed mills operated in May in both years, increasing from 75% in March in 2020 and 2021. The number of days operated was higher in all three months in 2021 than in 2020, with an average of 19 days in 2021 and 14 days in 2020. Respondents reported transportation restrictions and low demand as barriers to their operations in 2020, whereas they reported high market prices and low demand as barriers to their operations in 2021.

The average sales value per ton of feed was higher in 2021 than in 2020 (USD 1,016 per ton in 2020 vs USD 1,354 per ton in 2021). In 2020, the quantity of procured feed decreased from 1829 tons in March to only 184 tons in May (Figure 9). No feed had been procured in March 2021, although 588 tons was procured in May 2021.



Figure 6 Total quantity procured in tons, in 2020 and 2021.



## 4.2 Feed Sellers (pellet<sup>1</sup>)

The share of pellet feed sellers in operation was much higher in 2021. On average, 95% of the respondents operated their business in 2021. In contrast, in 2020, the share of business operated gradually increased from 25% in March to 67% in May, while all businesses were closed in April. This is a reflection of the first lockdown period in March 2020. The surveyed feed sellers cited COVID-19 related factors, such as temporary suspensions or transport restrictions as the reason for suspending their business. The average number of days these businesses were opened was on average 21 days in 2021, versus only 3 days in March 2020 and 8 days in May 2020.

The average sales value per ton of feed was higher in 2021 than in 2020, with an average of USD 1,585 per ton in 2021 and USD 1,252 per ton in 2020. Generally, the quantity of sold feed was stable in 2021.

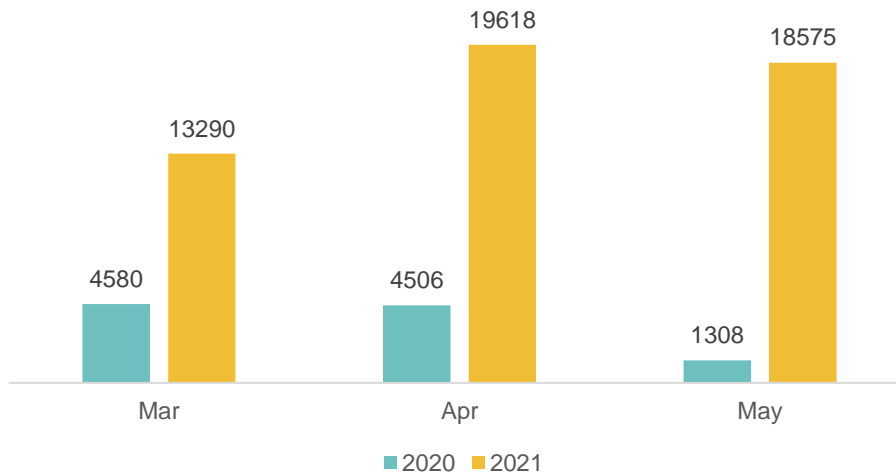
## 4.3 Fish Hatcheries

All fish hatcheries were in operation in May in both years, after an increase from 50% in 2020 and 67% in 2021. The average number of days these businesses remained open increased between March and May in both years, from 13 days in March to 23 days in May in 2020 and from 17 days in March to 27 days in May in 2021.

The total value of sold hatchlings was higher in 2020 than in 2021, with an average of \$ 3,467 in 2020 and \$ 305 in 2021. No hatchlings were sold in May 2021. In contrast, the total value of sold fingerling was higher in 2021 compared to 2020. On average the total value was almost 5-times higher in 2021 than in 2020 (\$ 17,161 in 2021 vs \$ 3,465 in 2020) (Figure 7).

<sup>1</sup> No non-pellet feed sellers were interviewed.  
COVID-19 impacts in Nigeria

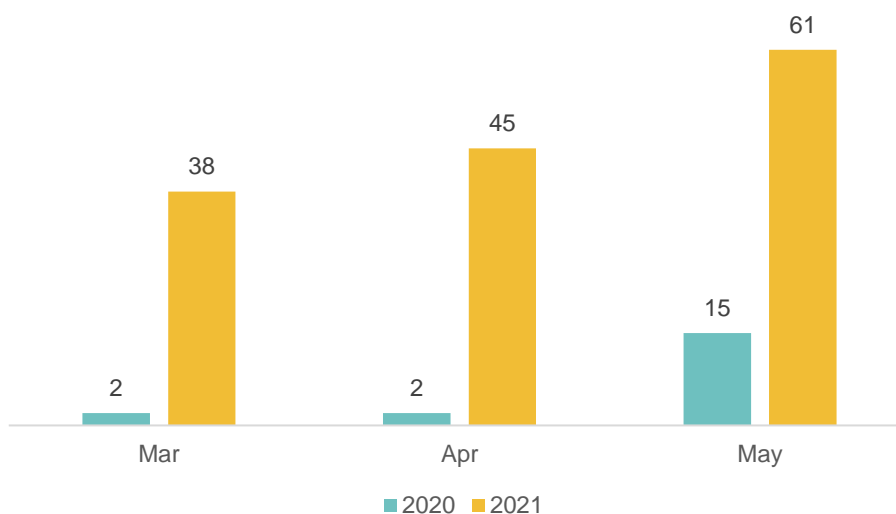
Figure 7 Total value of sold fingerling in USD in 2020 and 2021.



#### 4.4 Fish Farms

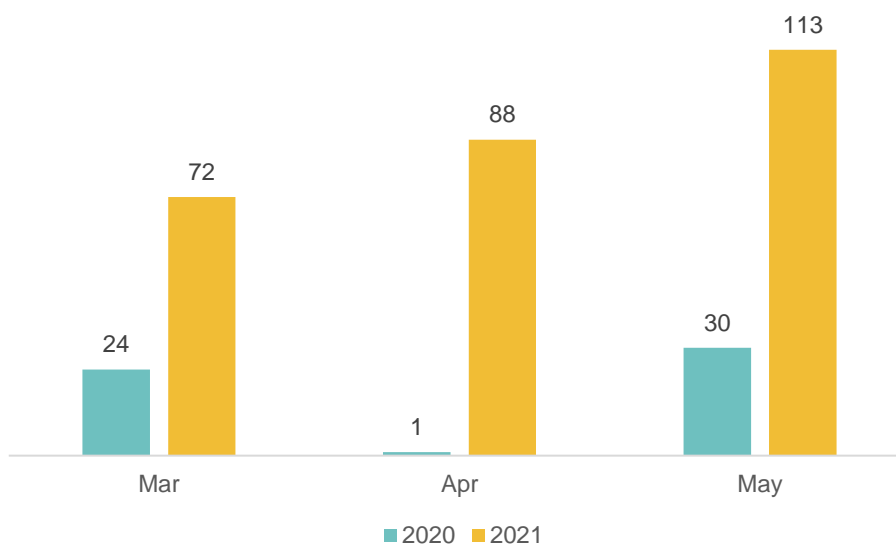
All surveyed fish farms operated in 2021, while in 2020 the share of respondents who operated their business increased from 73% in March to 95% in May. The procurement price of feeds was higher in 2021 than in 2020, while in 2020 the price gradually increased (from \$ 851 per ton in March to \$ 1,215 per ton in May), it decreased slightly over the same period in 2021 (from \$ 1930 per ton in March to \$ 1,703 per ton in May). The share of surveyed farms able to procure inputs whenever needed was considerably higher in 2021 than in 2020. In the period from March to May, the total quantity of procured input feed was on average 8 times higher in 2021 compared to 2020 (Figure 8).

Figure 8 Total quantity of feed input procured in tonnes, in 2020 and 2021.



Similar to the costs of farm inputs, the average farmgate price of fish sold was almost double in 2021 compared to 2020 (on average \$2.6 per kg in 2021 vs \$1.4 per kg in 2020). The quantity of sold fish was also higher in 2021, which steadily increased from 72 tons in March to 113 tons in May. In comparison, in 2020, the sold quantity decreased from 24 tons in March to 1 ton in April, before jumping to 30 tons in May (Figure 9). Reduced sales in 2020 are likely a result of the lockdown preventing market activities, whereas sales in 2021 reflect a strengthening of the market.

Figure 9 Total quantity of fish sold in tons in 2020 and 2021.



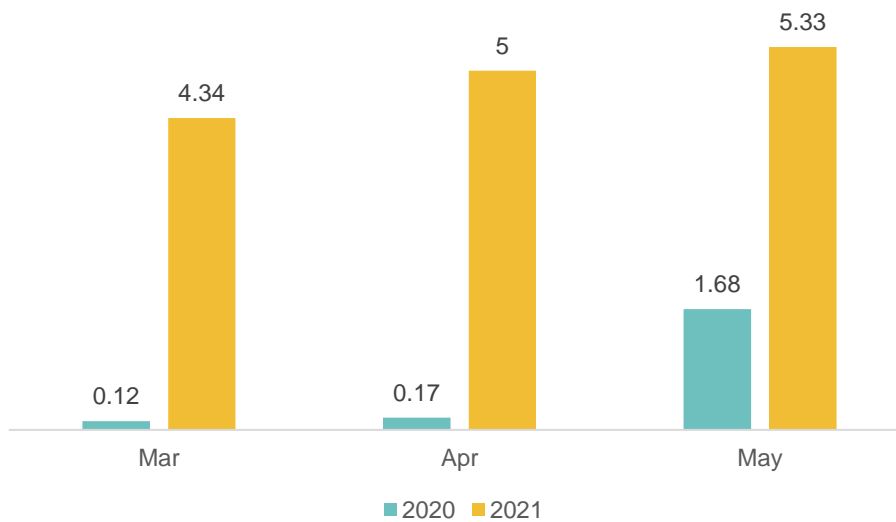
## 4.5 Fisher

In 2021, all surveyed fishers owned a boat, and the majority of the respondents have an engine boat (80%). All fishers went fishing between March and May in 2021, while in the first two months of 2020 only half of the fishers went out fishing, which then increased to 100% in May 2020. On average, the respondents when fishing for 14 days in 2021 and 11 days in 2020. In 2021, all the respondents fished on the beach or nearshore, while in 2020 the fishers fished mainly in natural water bodies (i.e., beel, inn, lake, etc.) or rivers.

The quantity of landed fish was considerably higher in 2021 compared to 2020. In 2020, on average 0.66 tons of fish were landed, while in 2021, the landed catch was more than 7-times higher (on average 4.89 tons) (Figure 10). The total quantity of sold fish followed a similar pattern. In 2020, the sold quantity increased from 0.09 tons in March to 1.44 tons in May. In comparison, in 2021, the sold quantity increased from 4.26 tons in March to 5.49 tons in May.

In the period between March and May, all respondents consumed their own catch in 2020, while in 2021 the percentage halved from 70% in March and 90% in April to 50% in May.

Figure 10 Quantity landed in tons in 2020 and 2021.

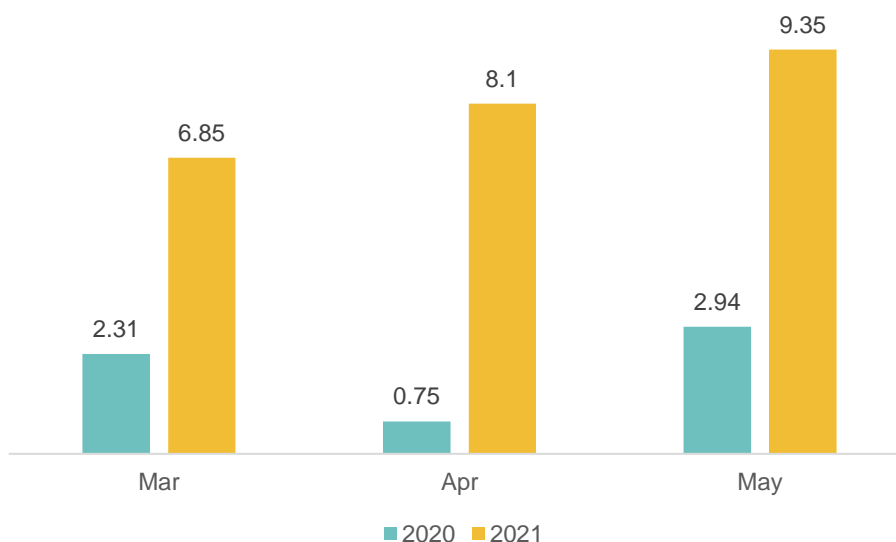


## 4.6 Fish processors

All surveyed fish processors operated their business in 2021, while in 2020, it increased from 50% in March and 40% in April, to 100% in May. Respondents reported temporary business suspension due to COVID and transport restrictions as the reasons for stopping their business in March and April 2020. Most processed fish was smoked or dried.

The quantity of fresh fish processed was considerably higher in 2021, compared to 2020. While in 2021, the quantity increased from 6.85 tons in March to 9.35 tons in May, in 2020 the produced quantity was on average 2 tons (Figure 11). The same pattern was observed with the quantity of processed fish sold, which was on average almost 5 times higher in 2021 compared to 2020.

Figure 11 Quantity of fresh fish processed in tons in 2020 and 2021.

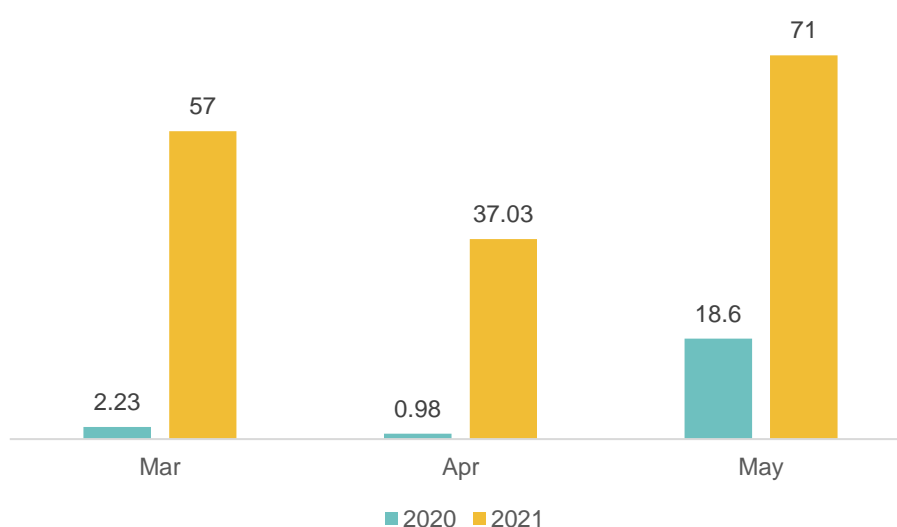


## 4.7 Fish traders

In 2021, all surveyed fish trader operated their business, while in 2020, the share ranged between 60% and 80%. Businesses operated for an average of 20 days per month in 2021 and 12 days per month in 2020. Temporary business suspension due to COVID and transport restrictions were the main reason for stopping the business in 2020.

The average sales price of farmed fish was slightly higher in 2021 than in 2020 (USD 2.02 vs USD 1.80, respectively). The quantity of farmed fish was much higher in 2021 compared to 2020, further indicating stronger market activities in 2021 than in 2020 (Figure 12). No shrimp, freshwater and marine fish were sold in 2020 and 2021, except for May 2021 where traders sold a small quantity of freshwater fish (1 ton).

Figure 12 Total quantity of sold farmed fish, in tons in 2020 and 2021.

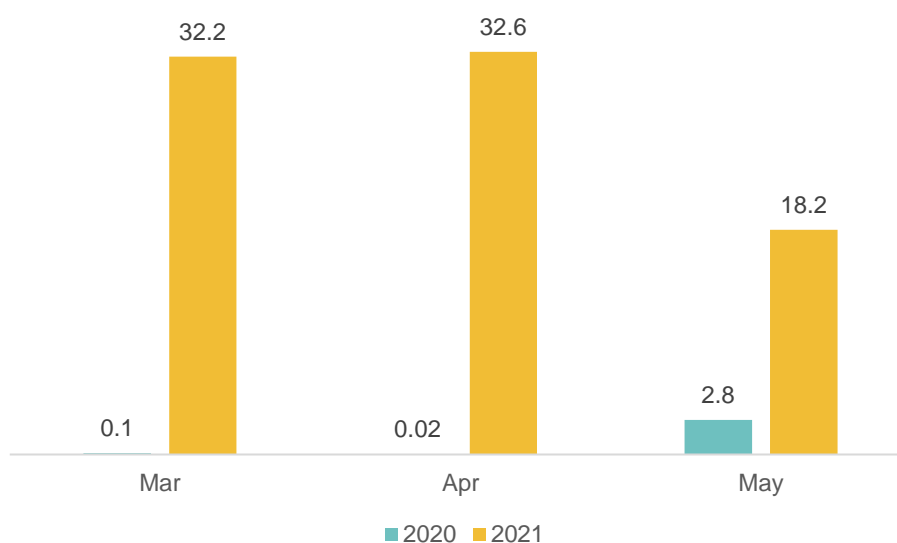


## 4.8 Fish Retailer

All of the surveyed fish retailers operated in 2021. In 2020, 22% operated their business in March, 11% in April, and 44% in May. The average number of days these businesses remained open was also higher in 2021 with an average of 25 days per month, compared to 4 days per month in 2020. Respondents cited restrictions on road transport and temporary business suspensions due to COVID as the main reasons for stopping business closures.

The average retail price of farmed fish sold by surveyed retailers was higher and more stable in 2021 than in 2020 (on average, \$ 3.66/kg and \$ 2.66/kg, respectively). The total quantity of farmed fish sold was also higher in 2021 compared to 2020 (Figure 13).

Figure 13 Total quantity of sold farmed fish, in tons in 2020 and 2021.



## Recommendations

1. Overall, this work indicated that the value chain in Nigeria was able to rebound after lockdowns and was generally resilient to the impacts of COVID-19; however, access to buyers remained low and food purchasing among farmers was lower than usual, likely a result of reduced income. Policy should continue to support the resiliency of these systems and support household food security through food subsidies or stamps and/or consumer marketing programmes.
2. Evidence of decreasing employment of women suggested that the impacts of the pandemic on female workers may be greater than those on male workers. As such, gender-responsive support programmes may be important.

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