RESEARCH PROGRAM ON Fish
Led by WorldFish

November 2020

Impacts of COVID-19 on Aquatic Food Supply Chains in Myanmar

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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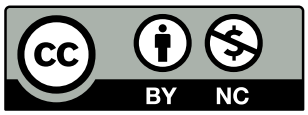

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Table of contents

1. Background

The first laboratory confirmed case of COVID-19 was registered in Myanmar on 23 March 2020. On 18 April a 'lockdown and stay home' order was given for seven Townships in Yangon Region. Restrictions were subsequently eased and on 21 July 50% of high schools opened. Gathering restrictions were also eased from a maximum of 5 to 15 people 29 July. Subsequently an increase in COVID-19 cases led to a return of restrictions on 1 September and these remain in place to date. At the start of November 2020, 78% of cases and 96% of deaths have been recorded in Yangon City. The main fish wholesale markets for the country are located in Yangon. Fish are distributed from these markets nationwide.

2. Overview

We conducted a monthly phone survey with fish supply chain actors in Myanmar to assess 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 totalled 142 respondents, comprised of the following: feed mills (4), feed sellers (12), fish hatcheries (15), fish farmers (45), fishers (25), traders (12), processors (11) and retailers (14). Areas covered included the regions of Ayeyarwady (29%), Yangon (21%), Shan State (25%), Sagaing (22%), and Mandalay (3%). A complete summary of survey results can be accessed here.

3. Key findings

The share of survey respondents attempting to buy inputs or sell products was highest in March, just before the onset of the pandemic, at 57% and 60%, respectively (Figure 1). The share of respondents attempting to buy products dropped 10 percentage points to 47% in April, when the first lockdown was implemented, but fell further thereafter, remaining at 42% in June and July. The share or respondents attempting to sell inputs followed an even more marked downward trend, declining steadily to 34% in June, before recovering slightly to 38% in July. These trends suggest that demand for production inputs and consumer goods was impacted substantially even after initial lockdown and movement restrictions were eased.

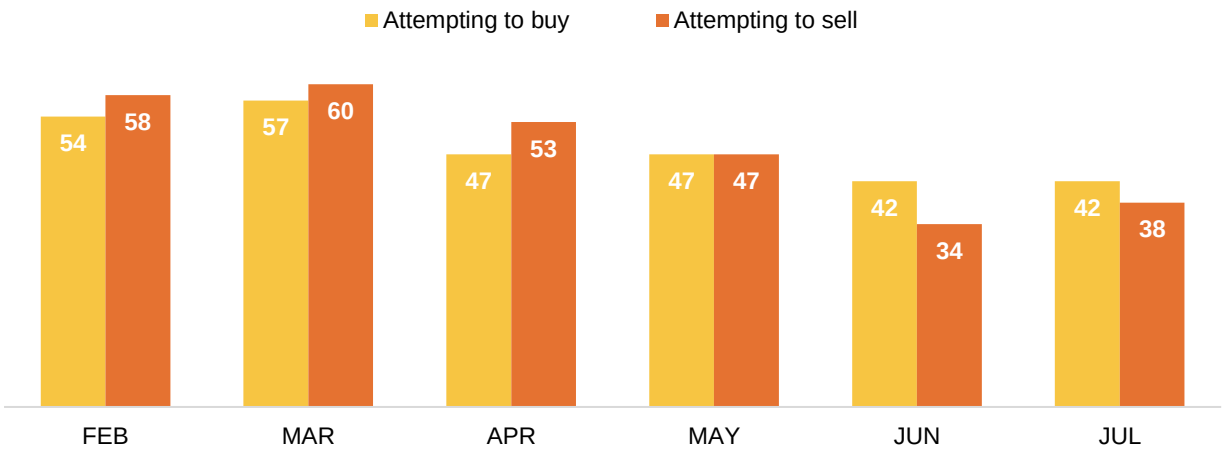

Figure 1. Respondents attempting to buy or sell inputs, by month (%).

The share of respondents able to access transport for their business needs fell by around 10 percentage points during the initial lockdown (from 97% in February to around 87% on April and May), but the impact was less severe than might have been expected given the movement restrictions in place, and rebounded quickly, to reach 98% in July (Figure 2). The share of respondents reporting being able to access inputs when needed followed an almost identical pattern. In contrast, the share of respondents reporting that they were able to find buyers for all the products they expected to sell remained fairly stable from February to April, at 91-94%, but declined sharply to 72% in June, before climbing slightly to 80% in July. This pattern appears indicative of a drop in the purchasing power from buyers that continued after the easing of initial restrictions implemented to control the COVID-19 outbreak.

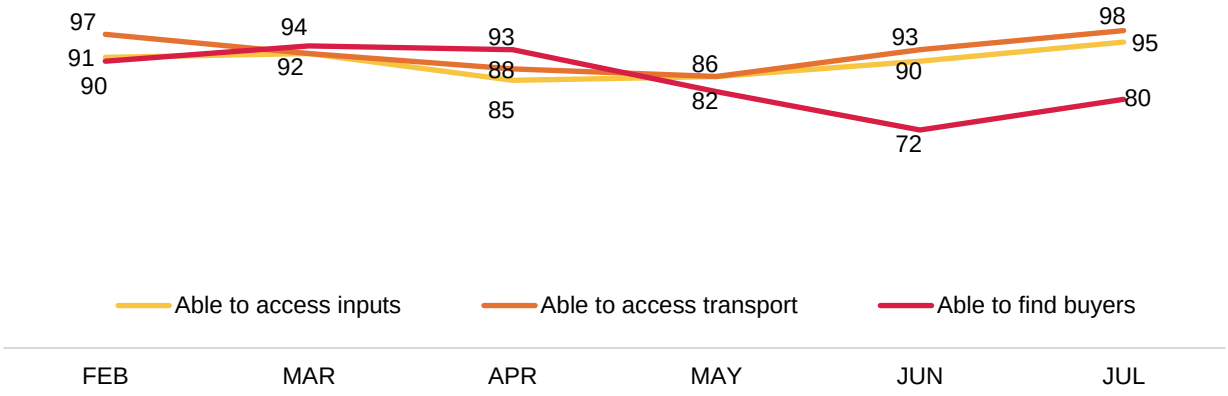

Figure 2. Respondents able to access inputs, transport or buyers, by month (%).

Employment followed a somewhat similar pattern. The percentage of respondents reporting employing male causal workers fell by around half between March and June (from 49% to 26%), before recovering partially to 38% in July (Figure 3). In contrast, the share of respondents hiring female casual workers dropped from 24% in April to 7% in May but remained low thereafter, reaching only 10% by July, suggesting that COVID-19 may have had differential impacts of on men's and women's ability to access paid work for. Around 10% of respondents were unable to hire labour between March and July, up from just 1% in February, suggesting that the COVID-19 outbreak impacted employers' ability to find workers, as well as and workers' ability to find employment. One other factor observed has been the conscious reduction of input costs; fish stocking densities, feed type (from more expensive pellet to more basic rice-bran and peanut oilcake) and a reduction in hired labour. These actions can be interpreted as risk mitigation actions in response to increased vulnerability.

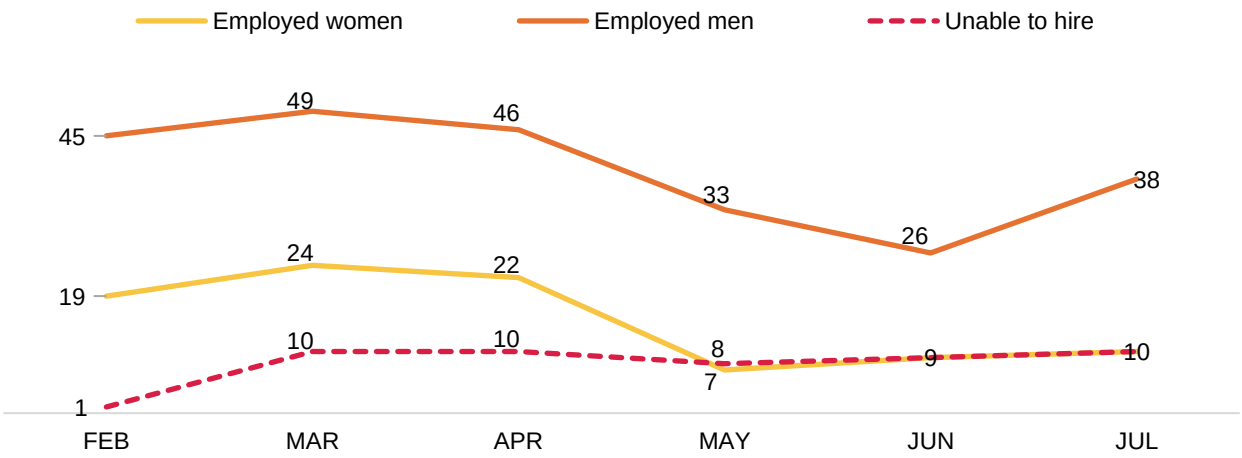

Figure 3. Respondents employing women or men casual workers, or unable to hire casual workers, by month (%).

In May, we began asking respondents whether they had experienced delays in accessing inputs and selling products, or experienced any reduction in the quantity of products sold as compared to 'business as usual'. 43% and 40% of respondents, respectively, reported that they had used fewer inputs or sold fewer products than usual in May. This number declined to 29% and 27% in July, respectively, suggesting improved access and availability of inputs in July, consistent with trends in Figure 2. A similar pattern was reported by respondents who experienced delays in accessing inputs and selling products. The share of respondents experiencing delays in selling products rose from 29% to 34% between May and June, before dropping to 18% in July, while those experiencing delays in accessing inputs climbed from 26% to 29%, before falling to 16% over the same time period.

From May onwards, we asked respondents if they had sufficient income to pay for their household's weekly expenses, and how the quantity of purchased food in the past month compared to usual circumstances. Both indicators worsened from May to June and remained relatively unchanged in July. The percentage of respondents earning a sufficient weekly income shrunk from 77% to 65% in this period. 29% of respondents reported purchasing less food than usual in May, which quickly rose to 39% in June and remained fairly stable in July, suggesting that the COVID-19 crisis continued to negatively impact respondent's food security four months on from the initial outbreak.

From May onwards, we also asked respondents if they had received any form of assistance, and whether they had travelled more than one mile from home during the past month (as an indicator of the severity of movement restriction). Over 92% of respondents did not receive any form of assistance between May and July. Among those who did receive some form of assistance, NGOs were reported as the main source in most cases. Fishers and farmers accounted for almost all of those who received assistance, with very other actors in the supply chain reporting receiving and support. The share of respondents travelling more than one mile from home increased from 45% to 59% between May and July, reflecting the relaxation of travel restrictions during this time period.

Hatcheries

A little over half of hatcheries were operational between February and April. This number rose to 79% in May and June, and increased further to 93% in July. The average number of days on which working hatcheries operated each month climbed slowly from 7 days in February to 19 in July. This trend indicates that seasonality exerted a greater influence on the timing of hatchery operations than the impacts of COVID-19. Hatchery operations are planned to ensure that fish are available for stocking at the start of the monsoon in late-May and early-June. To ensure fry or fingerlings of adequate size this means hatchery operations start as early as March-April.

Hatchling production peaked in July at 217,000 million, rising from 850,000 in February. Hatchling production was not linear, fluctuating from month to month while trending upward overall (Figure 4). Sales of hatchlings climbed steadily from May to July from 9 million to 33.5 million. Fry accounted for the bulk of seed sales, peaking at 242 million in June, while sales of fingerlings, which take longer to raise to larger sizes than hatchlings or fry, began to trend upward from July, when they reached 3.7 million.

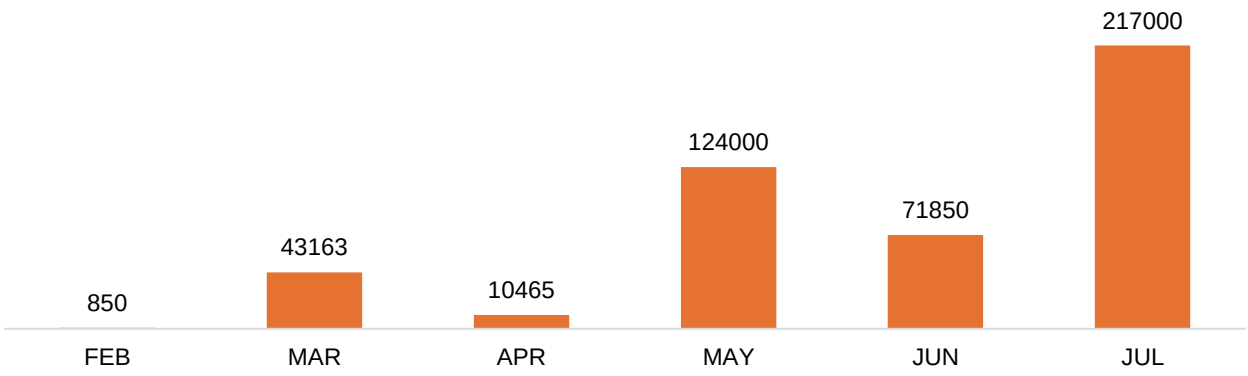

Figure 4. Total quantity (in 1000) of hatchlings produced, by month.

Feed Mills

Most surveyed feed mills in were operational in all months from February to July, with the exception of April and June, when a single mill (representing 25% of the sample) closed, citing 'other' reasons and low demand, respectively as the main reason for halting operations in these months. The average number of days feed mill businesses operated increased from 18 days in February to 26 days in July as the main growing season for farmed fish began with the onset of the monsoon.

Prices of raw materials used to manufacture feeds (most importantly, rice bran, peanut oilcake, and fish meal) remained fairly stable over the survey period. In most months between February and July, the average procurement price of raw material stood between MMK 480,000/t and MMK 510,000 million/t. The total quantity of raw material procured by surveyed feed mills gradually rose from 42 t in February to a peak of 554 t in July as production was ramped up.

The total amount of feed manufactured by surveyed mills fell gradually from 103 t to 52 t between February and May, before rising sharply to 326 in July. In May we began asking respondents about the quantity of feed sold in the past month. Following the same pattern, the total amount of feed sold by surveyed feed mills climbed from 59 t to 261t between May and July, with the total value of sales reflecting a similar trend.

Feed Sellers

We surveyed two sets of feed trading businesses; pelleted feed sellers, and non-pelleted feed sellers. The main non-pelleted feeds sold were rice bran and peanut oil cake. Pelleted feed sellers sold floating and sinking feeds.

All non-pelleted feed sellers were operational between February and July, but the number of operational pelleted seed sellers declined fairly steadily, from 100% in February to just 14% in June. Bad weather and low demand were the main reasons given by pelleted feed sellers who did not operate in March and April, respectively, with low demand and 'other' reasons the main causes cited thereafter. This pattern seems to suggest that farms continued to use cheaper feeds such as rice bran, while reducing purchases of more expensive pelleted feeds.

Pelleted feed was sold by surveyed businesses in all months except July, with the quantity of sales fluctuating between 5 t and 10 t per month. The reported sales price remained steady throughout this period at roughly MMK 1000/kg. In contrast, the total quantity of feed procured by non-pelleted feed sellers rose from 105 t to 153 t between May and June, before dropping to 12 t in July. Reported sales of non-pelleted feed were much lower than the quantities procured, and dropped from 24 t in May to 11 t in July. The price of peanut oilcake, a key non-pelleted feed, remained stable during this period at around MMK 670/kg

Farmers

The share of surveyed farmers operating followed a strong seasonal trend, rising steadily from 38% in February (the cool dry season) to 89% in July (the monsoon season). Relatively few farmers who remained inoperative after the onset of the pandemic cited problems related to COVID-19 as the cause, with most mentioning 'other reasons'.

The main feeds procured by surveyed farmers were rice bran, oil cake and pelleted feeds. The average procurement price for rice bran and oil cake fluctuated slightly from month to month throughout this period, though remaining quite stable overall at approximately MMK 260/kg MMK 800/kg, respectively. The quantity of feed procured by surveyed farms was low in February and March at around 650t, quickly around 2500 t April and May with the onset of the growing season, before falling back to approximately 1200 t in June and July. July was the peak month for procuring fish seed (1.4 million pieces) up from 128,900 piece in February, and 269,000 pieces in April. No fish seed was procured in May and June.

The total quantity of fish sold by surveyed farmers fluctuated from month to month over the survey period. Sales were lowest in February, April and June (ranging from 269 t in February to 636 t in April) and highest in March, May and July (ranging from 1164 t in May to 860 t in July). The average farmgate price received also fluctuated considerably during

this period, decreasing from MMK1922/kg in February to MMK 1389/kg in April, before rising to MMK

1806/kg in May and declining again to MMK1389 in July, equating to a decline of 28% over the entire period. Rohu accounted for the majority of fish sales between February and July.

Fishers

Almost all surveyed fishers operated inland waters, fishing in rivers and other natural water bodies. 96% of fishers fished with boats, averaging 5-6 meters in length. 88% of boats had engines, averaging 7HP in size.

Fishing activity fell sharply between February, when 88% of fishers reported fishing, and May/June, when only 12% fished, increasing slightly to 20% in July. The average number of days fished per month fell from 20 in February to a low of 2 in June, before increasing slightly to 4 in July. The number of hours fished per trip remained relatively stable at 4-6 over this period. The main reason cited by fishers for the sudden drop in fishing activity between May and July was the closed season for inland fisheries.

Despite only 20% of fishers operating, the greatest amount of fish was landed and sold in July, totalling1.4 t, resulting in a spike in fishers' total income in that month. The total quantity landed fell from 1.12 t in February to 0.34 t May, while the quantity sold dropped from 1.07 t to 0.33 t respectively, before recovering in July. In all months, 50% or less of surveyed fishers reported consuming their own catch, with the exception of April, where 59% reported doing so. Quantities consumed were small, however and fell from 1.92 kg/household in February to 0.52 kg/household in July.

Processors

The activities of fish processors who are mainly involved in fish drying are linked closely to those of fishers. A smaller number of surveyed processors also engaged in smoking farmed fish, but did so primarily in February and May only. Increasing numbers of processors suspended operations between May and July, due to the closed season for inland fisheries. Between 27% and 38% of processors were not operating between February and July, citing input suppliers out of stock, low demand, and travel restrictions as the main causes.

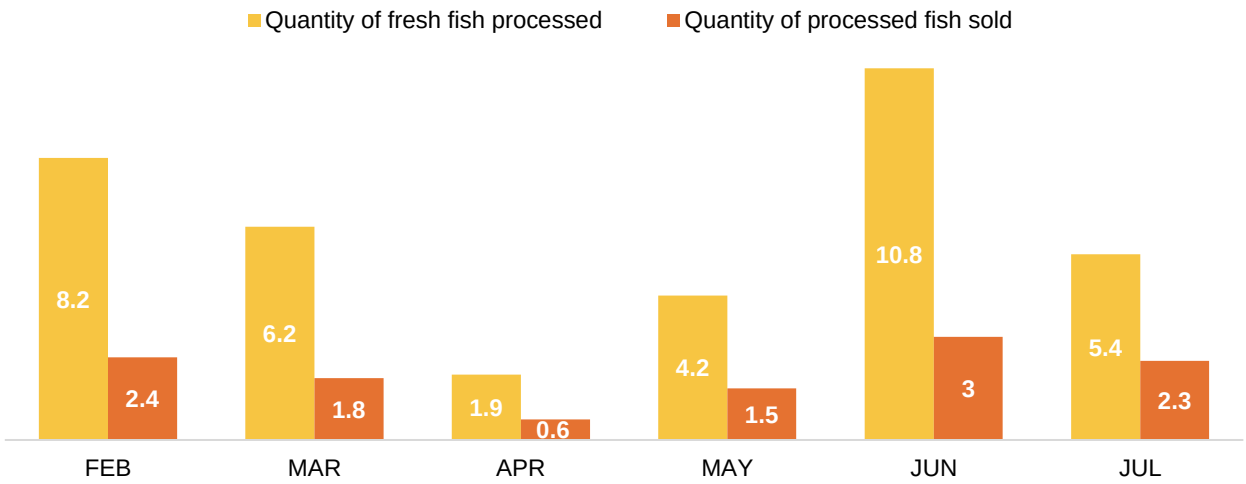

Figure 5. Total quantity (t) of fresh fish processed and processed fish sold, by month.

The total quantity of fresh fish processed and sold followed a 'U shape' curve between February and June, before dropping in July (Figure 5), the total income generated followed the same trend. The total quantity of fresh fish processed dropped from 8.2 t to 1.9 t between February and April, before sharply climbing to 10.8 t in June, shrinking 5.4 t in July. The quantity of processed fish sold followed the same trend, falling from 2.4 t to 0.6 t between February and April, then climbing to 3 t in June. The quantity of processed fish sold was less than the quantity of fresh fish procured, because several kilograms of fresh fish are used to produce one kilogram of dried fish.

Traders

Most surveyed fish traders operating throughout the period February and July, with only 8% not operational in April (during the first lockdown), and 18% non-operational June and July respectively. Traders who ceased operating in April citing suspending operations due to COVID-19, while those closing in June and July mentioned the closure of the fishing season as the main cause. The average number of days operated per month varied between 18 and 28 days over the survey period, with the greatest number of days of operation occurring in February, March and May, consistent with the share of respondents operating (100%).

Farmed fish, freshwater capture fish and marine capture fish were traded in all months, while shrimp were only traded in June and July. Total farmed fish sales by surveyed traders were low but stable from February to April (roughly 1700 t), before dropping to just 274 t in May. Sales then peaked in June, reaching 6241 t before falling back to 2749 t in July. Rohu and pangasius accounted for the largest share of farmed fish sold by traders across all months. Sales prices for rohu increased from MMK1875/kg in February to MMK 2050/kg in April during lockdown, but subsequently declined to about MMK 1650/kg in June and July (around 12% below February levels).

Sales of freshwater capture fish fell were higher in February to April than in May to July, averaging around 380 t in the first three months, and about 150 t in the following quarter. The sales price was approximately twice as high during the first half of this period as during the second, likely reflecting changing species composition as well as changing

prices per species. Hilsa accounted for the majority freshwater fish sales between February and May, while mixed small freshwater fish accounted for almost all fish sold in June.

Retailers

21% of fish retailers were inoperative from February to April, citing low demand and, in April only, temporary closures for reasons related to COVID-19. The number of inoperative retailers increased to 47% in June, with 33% remaining closed in July. The closed season for fishing was one of the most common reasons cited for ceasing operations during these months.

Farmed fish accounted for the largest share of reported sales. The total quantity of farmed fish sold by surveyed retailers trended was highest in May (958 t) and July (599 t), but approximately 200-300 t in other months. Rohu accounted for the majority of all farmed fish sold over the survey period. The average retail sales price of rohu followed a similar pattern to that reported by traders, increasing 10% from approximately MMK2230/kg in February and March to MMK 2443/kg during the first lockdown in April, then dropping to approximately

MMK1800/kg in subsequent months (a fall of 19% since February), suggesting sluggish demand.

In contrast, freshwater capture fish sales were highest from March to May, hovering around the 50 t mark, before dwindling to almost nothing in July, due to seasonal effects. Marine fish sales fell from 123 t in February to 16 t in April, before peaking at 398 t in May. There were no sales of marine fish in June and July, consistent with the effect of the closed season for fishing. Marine and freshwater capture fish prices tended to decline over time, although this could reflect seasonal changes in species composition as well as demand/supply interactions. Shrimp sales remained relatively steady between 13 t and 22 t over the survey period, peaking in June and July (22t).

4. Recommendations

- Keeping wet markets open and operating safely is key to maintaining demand and keeping the supply chain functioning.
- Safeguarding access to transport services and ensuring the free movement of merchandise is also essential.
- Few supply chain actors apart from farmers and fishers have received any assistance with COVID-19 recovery to date. Enterprises that have lost substantial amounts of revenue or face cash flow problems may need financial support to facilitate their continued operation.
- Women's ability to find work in fish supply chains during the survey period has been more severely impacted than men's employment. Further research is needed to understand and address the reasons for this trend.
- Consider the possibility of formal credit schemes with associated insurance for licenced operators with a track record of using Best Management Practices and or Hazard Analysis and Critical Control Point (HACCP) management systems in

which food safety is addressed through the analysis and control of biological, chemical, and physical hazards.

- Ensure that fish farmers are aware of the benefits from the production of fast-growing fish such as some of the Small Indigenous fish Species (SIS) e.g. the Mola carplet (*Amblypharyngodon mola*), or Genetically Improved Farmed Tilapia (GIFT). Shorter production cycles can increase turnover and cashflow and help ensure fish are consistently available for sale and consumption.
- A number of virtual extension applications are now in use in Myanmar including Greenway, Village Link and most recently Golden Fish by Single Spark. These Apps can be used to disseminate information on COVID-19 safe production systems and post-harvest activities.

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