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Covid-19 Opens up domestic market for Indian shrimp

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ABSTRACT

COVID-19 pandemic presents both a challenge and an opportunity to the Indian shrimp sector. With revitalizing the institutional arrangements and redirecting the focus, the Indian shrimp industry can flourish just by adapting to the needs of the local demand, even when the export prospects are uncertain. This paper takes a historical perspective of Indian shrimp farming and exports and suggests a domestic alternative-supplementary market for Indian farmed shrimp, resulting from COVID-19.

1. Introduction

COVID-19 pandemic has brought significant changes in several spheres of Indian lives and livelihoods. Its implications on the food system in terms of food supply, food access by the poor, the functioning of the domestic and global markets in which India operates, continue to unravel. In response to these changes, the recent sweeping policy changes announced by the Finance Minister of India on May 15 shows how a crisis induced by a health emergency can have profound implications on the functioning of the food and agricultural markets. Some of the key policy measures taken by the Government of India included the removal of restrictions imposed by the Essential Commodities Act of 1955 over the past 60 years, relaxation of the Agricultural Produce and Marketing Committee Act, measures to strengthen farmers markets and the farmers’ based organizations, interventions to improve the quality of the agricultural products, including livestock and fisheries in the Kissan Credit card scheme for facilitating better credit for the smallholder farmers (RBI, 2017) and connecting the agricultural markets throughout the country through enhanced e-NAM platform (Government of India, 2016). Although policy advisors advocated these policy interventions for more than three decades, since the economic reforms of the 1990s, these schemes have been rolled out only recently, and they will transform the Indian food system in the years to come. The Confederation of Indian Industry (CII) has recommended a slew of measures to boost aquaculture exports amidst the Covid-19 pandemic (Kumar, 2020). Recommendations include assistance to aquaculture farmers by extending subsidy for seed and feed supply as well as power. In this paper, we look at the impact of these policy measures and the pandemic-induced market disruptions on the Indian Shrimp sector with the perspective of how they can meet the growing demand of the domestic market, resulting from the changes in the global shrimp markets.

2. Data sources and methodology

This paper takes a contemporary approach and makes an assessment of the possibilities of building up a domestic market for Indian farmed shrimp. The immediate objectives were to document the severe restrictions placed on the shrimp farming community in India with the onset of the pandemic, the enormous economic and emotional stress faced by farmers and trade, the resilience of this community to come to terms with the new normal and to explore the possibilities of and invent a domestic market for Indian farmed shrimp. Data sources are given in Table 1.

Price movements in the US, the lead export market for shrimp from India, were captured by using the data from the US Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) Fishery Market News of the World Bank. Simple graphical representation of data in respect of movement of absolute export wholesale prices of Indian white shrimp, *Penaeus vannamei* during the years 2015-2020 (Sunny et al., 2021; Campbell et al., 2021).

Market channels of exports of various species of shrimp across markets and size grades were being compiled by the MPEDA through their field offices and published in Price Indicator of Marine Products.

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3. Results and discussion

3.1. Impact of Covid-19 on shrimp farming in India (March–May 2020)

Due to the COVID-19 pandemic and its aftermath, the Society of Aquaculture Professionals, India, anticipated a loss of INR 4000 crores with exports to the USA and Europe slowing down, and China buying less (Krishnakumar, 2020). The Covid-19 has therefore been particularly hard on the shrimp aquaculture sector. The pandemic brought high level of disruptions in the supply chain of the aquaculture sector. The ban on international cargo, caused by the national lockdown in late March 2020, brought the import of brood-stock shrimp (mother shrimp) and live feed (required for brood-stock rearing) to a standstill. India produces around 80 billion shrimp seeds a year from the imported brood-stock, of which 50% is produced in the first half of the year. Though the seed production was sufficient to meet the demand during the first half of 2020, the seed production programmes of more than 335 hatcheries were thrown out of gear due to the COVID-19 induced import restrictions. The immediate impact of the lockdown owing to Covid-19 was the abrupt drop in shrimp seed sales, compounded by transportation and labor problems (Krishnakumar, 2020). Ban on international air cargo has also led to a decrease in shrimp export orders, which in turn has reduced the net sown area. The intensity of shrimp farming reduced, and hatcheries were forced to bury the unsold seeds (Dash, 2020a, 2020b). This total disruption in hatchery seed production will have a direct impact on farming operations for the rest of the year even as the COVID-19 induced restrictions are removed. Cost overruns during the current season have clearly put the majority of the shrimp farmers on their back-foot. Inventory buildup, contracted wages to hired labor and technical staff, as well as other committed expenditure, have pushed the shrimp farmers into severe indebtedness. Industry sources expect output and margins to reduce by half in the current season (CIBA, 2020). The All India Shrimp Hatcheries Association had announced that farmers were going in for premature harvests in panic (Mohanty, 2020). Support architecture, otherwise called Minor, Small and Medium Enterprises (MSME), like those servicing aermers, pumps, generators, and disease diagnostic laboratories in the private sector, have also suffered almost total loss owing to the Covid-19 lockdown.

Take, for example, the 72 fish meal and fish oil companies (FMFO) who are the drivers of the Mangalore-Karwar fishery economy in Karnataka. The Indian aquafeed industry was valued at USD 1.2 billion in 2017 (Mordorintelligence, 2020), but Covid-19 has brought the industry to a near halt (John, 2020; Arasu, 2020). CIBA (2020) has estimated that it takes 1.2–1.3 million tons of shrimp feed to keep the shrimp farming segment of the sector, going. Scaling down production due to lack of raw materials, transportation constraints, labor issues and demand were driving the feed industry up the wall. Similar is the case with other nutritional supplements whose demand has plummeted, causing secondary problems both in the supply as well as value chains. CIBA

1 The seed market for shrimp is serviced by 311 hatcheries and 90 nauplli rearing centres in India. There are another set of 24 hatcheries operating on consortium basis i.e. on a partnership basis. Each of these hatcheries has been authorized to import a certain number of pairs of brooders each year. Broods are normally sourced from the USA, Madagascar and Mexico. These shrimp hatcheries in turn depend on broodstock imported from abroad to keep their operations ticking. India imported 1,24,957 pairs of brood white shrimp during 2019–20 through 14 authorized suppliers. In 2020, India has already imported 63,430 pairs of white shrimp broodNR Therefore seed production was ensured during the first half of 2020. In addition to brooders, hatcheries also need live feed, Artemia cyst and polychaete worms to keep the seed production process going. Live feeds and other seed production growth promoters are normally imported from Thailand and Vietnam.

2 As demand for low-value bycatch kept increasing, the 2847 trawlers in Karnataka kept the supply chain of the 52–70 FMFO companies alive and running. The phenomenal growth in the fish meal industry is represented by the sharp increase in trash fish catch at Bundar, Mangalore, Karnataka. From just 3% in 2008, the share of trash fish in trawl catch had zoomed to 26% in 2011 and almost 50% now. The price of trash fish, too, increased from INR 4 per kilogram in 2008 to INR 16 in 2012. Fish meal as an ingredient in feed cannot be replaced because of the amino acid profile of the fish as well as other unidentified growth factors. When factories were set up in 1989, they used to handle about 100 t of raw fish per day; now they handle up to 500 t. Its domestic feed mills (fish feed factories of India) have the capacity to produce 2.88 million metric tonnes (MT).

### Table 1

| Source Type | Description |
|-------------|-------------|
| Marine Products Exports Development Authority (MPEDA), India | Nodal institutional agency for marine products exports from India |
| National Fisheries Development Board (NFDB), India | Nodal institutional agency for Inland Fisheries Development |
| Coastal Aquaculture Authority (CAA), India | Regulatory authority for inland aquaculture |
| Seafood Exporters Association of India (SEA), India | Nodal agency for Indian seafood exporters |
| Society of Aquaculture Professional (SAP), India | Association of aquaculture professionals |
| Ministry of Fisheries, Animal Husbandry, and Dairying | Union Government Ministry, New Delhi |
| US Department of Commerce, NOAA, Fishery Market News, World Bank | Database |

Export (PRIME) on a weekly basis till few years back (Singh et al., 2021). But since this publication has been discontinued, required data for selected months in 2019 and 2020 were obtained from MPEDA field offices. Info-graphs to represent data to track the movement of absolute prices in the three states of Andhra Pradesh, Tamil Nadu and Gujarat were developed (Pitcher, 2001; Sohn et al., 2021). Case studies approach were used to describe the hardships and the resilience of the shrimp farmers when confronted with the covid-19 pandemic protocols, restrictions and its subsequent relaxation (Parisi and Bekier, 2021; Hossain et al., 2022).
(2020) also has estimated reduction of the feed and healthcare market by as much as 40% and employment by 30%. Harvested output during the early lockdown period had no takers. The exporters were constrained with a shortage of labor and refrigerated trucks to transport the harvests from the farms. Shortage of manpower, poor quality of harvested material, inadequate volumes to run the processing plants at optimum performance, lack of sufficient quantities of material in required size grades, cancellation of export orders, and insufficient storage capacity were the deterrents faced and being faced by the seafood processors during the lockdown as well.

3.2. International price trends

The area and production of shrimp in India had reportedly reduced by 40% and exports by 30% during May 2020 (Chattanya, 2020). This has resulted in a steady rise in the import (destination) prices of Indian shrimp (Fig. 1).

The import prices have been less than INR 1000/pound of frozen, shell-on, head-on Indian white shrimp till January 2020. (Gibson and Feiijo, 2020). A price rise over INR 1000/pound is noticed only after March 2020 (INR 1048.43) and April (INR 1058.27), indicating constraints in importing shrimp from India.

The economic slowdown and the COVID-19 pandemic placed a double burden on the performance of the shrimp sector for 2020-21. CIBA (2020) forecasted that production is not likely to exceed 0.5 million tons during the current year. India exported 6,67,141 metric tons of shrimp valued at US$ 4.9 billion (INR 35 billion) last year (2018-19), and the gross shrimp production was more than 0.8 million tons. The country shipped US$ 6.73 billion (INR 465.89 billion) worth of marine products in 2018-19. But India’s seafood exports would most likely miss the US$ 7 billion target for 2020-21, as the spread of COVID-19 has adversely impacted demand in many overseas destinations. Japan and the US are reportedly buying selectively while the European market has gone for a toss. China imports as much as 25% of Indian shrimp and continues to do so even during this pandemic period (Dao, 2020).

3.3. Domestic price trends

It was on March 24, 2020 that the first national lockdown was imposed on the country. The country obviously came to a standstill for the first 2 weeks. March is also the month of harvest for the winter crop of shrimp. The lockdown on the fisheries and aquaculture sectors were lifted in India on April 10, 2020. A lifting of the lockdown would not mean everything would fall in place as it was prior to the pandemic. The adjustments to the pandemic protocols and also for the supply chain to get into near normal motion took another month. Therefore what happened to the shrimp and shrimp farmers during this period of extreme distress was of primary importance and hence the prices of various size grades in the normal year of 2019 and 2020 were compared to bring out an overall picture.

Fig. 2 shows the absolute price movements for shrimp in the Andhra Pradesh across months of April and May in the 2 years 2019 and 2020 respectively. The price differential for the size grade of 20C (C) in the month of April in the 2 years was INR 50/Kg more on April 1, 2019 than in 2020 while it remained equal between the years for April 20th and fell by INR 65/Kg for May 10, 2020. This indicated severe constraints in exports of 20 C size grade in the month of May 2020 compared to the previous year owing to Covid-19 pandemic protocols and restrictions.

Again, for 40C shrimp, the price differentials for the 2 months of April and May 2019 and 2020 respectively were much wider in in Andhra Pradesh. The absolute price differentials were as much as INR 240/Kg, INR 80/Kg and INR 115/Kg in favor of 2019 prices indicating a dramatic fall in exports orders or cancellations plus severe constraints in meeting export orders that could have possibly been honored. The prices for the 40C per kilogram were INR 480; INR 380 and INR 480 on April 1st, 10th and May 10, respectively in 2019, which fell to INR 240; INR 300 and INR 365 on the same dates in 2020. It may be noted larger shrimp i.e. High count shrimps are exported while lower count shrimp i.e. size grades less than 50 counts find their way to the local domestic market. But it should be borne in mind that there is nothing sacrosanct about sizes for export. Depending on export orders, sizes slightly smaller than 50C are also exported. So this fluid distinction provides acceptable market segmentation for Indian farmed shrimp (Krishnan et al., 2021).

As far as 60C shrimp were concerned, prices differentials per kilogram in Andhra Pradesh for the said dates and months were INR 70, INR 10 and INR (–) 20 in 2019 compared to 2020. The absolute prices per kilogram were INR 270; INR 280 and INR 250 on the said dates in 2019, which declined to INR 200; INR 270 on April 1st, 10th, 2020, and rose to INR 295 on May 1, 2020. This again indicated that supply and demand constraints prevented full exploitation of the market potential and it was only in May 2020, that 60C shrimp found its feet and registered an increase in price of INR 20/Kg which could possibly be attributed to enhanced domestic demand owing to government initiatives in promoting seafood as nutritious fortification to ward off Covid 19.

For 80C shrimp, the rate per kilogram was INR 220; INR 250 and INR 220 on the specified dates in 2019, and it fell to INR 170 on April 1, 2020; remained steady at INR 250 on April 10 and rose to INR 265 on May 10. The absolute price trends again clearly indicated a surge in the
Therefore, between the 2 years, the pandemic hurt prices for higher counts and lesser impact on smaller counts relatively in Andhra Pradesh, indicating a breakdown in export logistics both physical (disrupted container movements) as well as because of enforced Covid 19 government protocols. The domestic market which traditionally absorbed smaller counts saw a surge in demand leading to higher prices and enhanced absorptive capacity of the markets for shrimp from Andhra Pradesh.

The absolute price differentials per kilogram for 20C shrimp Tamil Nadu on April 1, 10 and May 10, 2019 and 2020 were INR 50, NIL and INR 80 in favor of 2019. Tamil Nadu trade raised INR 500, INR 500 and INR 550/Kg on April 1st, 10th and May 10, 2019, for 20C shrimp, which fell to INR 450 and INR 480 on April 1 and May 10, 2020, while it remained at INR 500 on April 10 in both the years. This again indicated that Tamil Nadu started facing issues in export markets of larger counts of shrimp initially which were managed efficiently in the near term and which again fell into disarray in the month of May 2020 indicated by the dramatic fall in price per kilogram to the extent of INR 80 for 20C shrimp.

For 40C shrimp, Tamil Nadu trade raised INR 450, INR 430 and INR 430/Kg on the three dates in 2019, and it fell to INR 290, INR 300 and INR 350/Kg for the same periods in 2020. The absolute price differentials per kilogram were significantly high for this size grade. It was as much as INR 160, INR 130 and INR 80. This size of 40C caters to the export market and hence the fall in absolute prices may be attributed to export market distortions owing to the pandemic.

The data also shows that in Tamil Nadu, the trends in the absolute prices per kilogram for the 60C, 80C and 100C in the months of April and May 2019 and 2020 were true to form. They fell on April 1 and 10th and picked up on May 10th clearly indicating that Covid-19 protocols were a serious constraint to the movement of the people and hence prices fell in April and when the protocols were relaxed for the fisheries sector and local supply chain was getting restored in May, prices picked up.

For 60C shrimp, the prices per kilogram were INR 290, INR 290 and INR 300/Kg in Tamil Nadu on the said dates, which fell to INR 180, 210 on April 1st and 10th respectively and was INR 260/Kg on May 10, 2020. As far as 100C shrimp were concerned, they commanded a price of INR 220, INR 230 and INR 190 on April 1st, 10th and May 10, which declined to INR 160, 190 on April 1st and 10th and rose to INR240/Kg on May 10, 2020. Tamil Nadu seems to have suffered more
in the off-take of both smaller and higher counts. But it appears to have improved its performance in May 2020 as it was able to gain in all the segments of counts.

The marginal differences in the prices discovery in Andhra Pradesh and Tamil Nadu shrimp could be attributed to the entrenched time tested import-export agreements in Andhra Pradesh compared to Tamil Nadu. Tamil Nadu is a later entrant to shrimp farming compared to Andhra Pradesh. Therefore in the short run the resilience of the Andhra Pradesh farmers may have been sharper resulting in relatively faster favorable upturn in market situations.

Prices for 40C shrimp was INR 360/kg on May 10, 2019, which fell to INR 340/Kg on the same date in 2020 in Gujarat. Shrimp commanded a price of INR 270/Kg on May 10, 2019 for 60C, which rose to INR 290/Kg on the same date in 2020. On May 10, 2019, 80C shrimp fetched INR 220/kg on May 10, 2019 which rose to INR 240/kg on the same date in 2020. Shrimp 100C fetched INR 200/Kg on May 10, 2019 which rose to INR 240/kg in 2020. Fig. 2 indicated that export sizes were less resilient to supply constraints while the relative performance of smaller sizes was much better in the month of May 2020. But overall, price and market situations in Gujarat were not very different from Andhra Pradesh and Tamil Nadu and the reactions of the export and domestic markets of the state were in sync with the other two states.

3.4. The historical perspective

Though fish has always been a part of the daily diet of the coastal population in India, a mental block always existed in the minds of the shrimp traders that shrimp, being pricey, are an export item and had no place in the local markets. The tag that shrimp commanded a high price in export markets and hence exported was a tagline that was earned during the late 1980s and early 1990s when commercial shrimp farming took off. India had reached the rock bottom of its foreign exchange reserves, and the New Economic Policy in 1991 had a definite agenda to shore up foreign exchange reserves to meet import bills and save the face of the nation. It was during that period that commercial shrimp farming was given serious attention since it could bring in foreign exchange in a quick time. The MPEDA established in 1972, picked up the gauntlet, and the momentum of marine products exports significantly surged since the early 1990s. The Government of India, through MPEDA, extended number of subsidies and schemes that enabled seafood exports to grow multifold. The institutional architecture for the shrimp export market was firmly established by the end of the 1990s. But with the advent of the WTO and India emerging as a powerhouse in Information Technology (IT) increasing incomes and accessibility to international lifestyles also brought in changes to the daily diet of the Indian. But still the hangover of the export tag on shrimp has remained and it was only when the export market broke down during the pandemic, the farmers realized the scope of the domestic market for shrimp. This has also been realized by the Institutional agencies who have taken several steps to engage this segment of the market for shrimp (Planning and Monitoring Unit, 2021).

India with 27% and Ecuador with 23%, are key players in driving the world shrimp exports. Andhra Pradesh with 71% share, is the largest producer of shrimp in the country, followed by West Bengal (10%), Odisha (9%), Gujarat (5.5%), and Tamil Nadu (2.7%).

3.5. The institutional architecture

Several institutions work in harmony and contribute to the achievement of the goals of the shrimp sector in India. Primarily MPEDA, under the Ministry of Commerce, Government of India, is vested with the responsibility of promoting exports of Indian seafood, including shrimp. In due course, MPEDA also got into the promotion of aquaculture farming throughout India, primarily shrimp culture. MPEDA has also established its own hatchery and brood-stock rearing center that supplies specific pathogen-free shrimp seeds to farmers. MPEDA is also the last mile certifying agency that takes care of ensuring the export of certified seafood products only. MPEDA issues export licenses and ensures only certified processing plants (that are Hazard Analysis Critical Control Points (HACCP) compliant and/or European Union (EU) certification norms compliant) export seafood. MPEDA also has its offices abroad that look after the interests of Indian seafood exports.

Hand in hand with MPEDA, The Coastal Aquaculture Authority (CAA) (Ministry of Animal Husbandry, Dairying and Fisheries) works towards ensuring legal aquaculture and is the regulatory authority. CAA works in tandem with the state departments of fisheries and is directly responsible for the approval of licenses for shrimp farms. Other government agencies such as the Airports Authority of India are also working hand in hand with MPEDA and importers of aquaculture inputs including brood-stock. The Indian Council of Agricultural Research (ICAR) fisheries research institutes are involved in brood-stock quarantine and disease management at the field level along with the state department of fisheries. The National Fisheries Development Board (NFBDB) is currently responsible for the development of fisheries activities within the country. Collectively, they face the new challenge of managing the possible shrimp export decline due to COVID-19. Yet, their collective action can mobilize the domestic market to provide an additional market for shrimp.

3.6. The emergence of the domestic market

Cut back to the 1990s, not only the shrimp sector got the support, but the Information Technology (IT) sector opened up at the same time leading to a slow and steady transformation of the socio-economic, cultural, and migration pattern of young qualified upwardly mobile IT professionals, investment bankers and their ilk. incomes boomed and the economy took off on an unprecedented growth path based on the increasing contribution of the IT sector and its support institutional service sectors starting mid-1990’s. Time was at a premium and the young professionals hardly had the time to cook and eat. Fast food restaurants and western cuisine came in through the pizza wave. The popularity of Pizza Hut, Domino Pizzas followed by Subway beat more regular restaurants hollow. While poultry and mutton found favor among the restaurateurs, fish and shrimp lagged owing to their lower shelf life, handling issues besides odor and additional investment required on exclusive cold storage facilities. An effort by the first author to push fish as a fast food item since it had local consumer acceptance did not yield success in the mid-1990s as the clientele were more interested in being seen in the flashy restaurants than in what they ate. Since then and till recently, shrimp stayed an export item while fresh fish was a home-made item of food or, at best, found favor among clientele in restaurants in states of West Bengal and Kerala. But, Covid-19 pandemic seems to have changed all that.

We present two case studies to illustrate the immediate impact of the COVID-19 pandemic on the emergence of the domestic market for shrimp – one at the farm level and one at the industry level.

At the farm level, take the case of shrimp farmer, Mr. Pandian, who all these years has never missed a step. He has been selling his farmed shrimp for a number of years in the Marakanam fish market, Tamil Nadu. He had his faithful clientele and was never really bothered with the frequent calls of produce aggregators who tried to procure his crop for processing companies that catered to markets abroad. And he was never the one to get into an informal input-output supply chain arrangement with these commission agents since that invariably led to a debt trap. Now with the export market for Indian farmed shrimp failing, what are the chances that Indian farmed shrimp may turn to the domestic market as an alternative/additional market space. Hiccups in the supply chain in early April resulted in many other shrimp farmers joining Pandian to sell their shrimp in the Marakanam local market. The produce on offer is also being taken up by the local consumers regularly. Ever since the lockdown was exempted for the fisheries and aquaculture
sector, shrimp also has been moving into major urban markets, including Chennai and Puducherry. Social distancing, working from home, and cooking at home is back and here to stay for a long time. Consuming nutritious food is now a priority, and shrimp does a world of good, consumed in small portions. This phenomenon is not restricted to Tamil Nadu and Puducherry but is replicated all across the country (Mohanty, 2020; PTI, 2020).

At the market level, take the case of Mr. Durai Murugan of Sea Gem Aqua Farms, Thanjavur, Tamil Nadu. He was exhilarated on LinkedIn when he declared that farmers were getting INR 300/kg for 100C farmed shrimp in the domestic market. The shrimp farmer in Gujarat, Dr. Manoj Sharma of Mayank Aqua Farms Surat, also expressed happiness at the emerging local market for 70 to 100C farmed shrimp and higher consumer off-take. Shrimp 150C (6-7 g) to 50C (20 g) sold in the domestic market at prices ranging from INR 200-450/Kg. Higher counts found their way to the local markets for a brief while during April following the lockdown. In Mumbai, Ganesh Nakhawa, a UK educated marine fisher, has innovated fish marketing. He has remodeled his car and engaged in door-to-door sales of fresh fish based on orders received on his App. He was forced to adapt to due to Covid-19 (Niltamware, 2020). Kerala Fishers are a delighted lot since the relaxation of fishing ban owing to Covid-19. The price of their landed fish is now being fixed by the harbor management societies headed by the district collector resulting in a higher share of the consumer rupee to the fisher. An IT application of the fisheries department enables advanced fish purchase bookings resulting in hassle-free sales (The Hindu Business Line, 2020). The presence of mind and innovative spirit of the market is at the forefront during this pandemic. The fisheries sector, which includes the culture shrimp segment, is out to prove its mettle in these trying times.

Some markets remain latent, owing to preconceived business notions. It is common knowledge that star hotels are sourcing regular supplies of low count (<30C) shrimp. Similarly, high-end restaurants and hotels do patronize low count shrimp in India. Freshwater white shrimp 50C commands INR 399/ for a gross weight of 480 g and INR 799/ for 840 g in Licious, the online shopping for fresh fish. Licious operates in 9 markets in India, which includes secondary markets like Panchkula (Haryana) and Mohali (Punjab). The number of online fresh fish and shrimp vendors has multiplied over time. A tele-conversation with meat service brand Licious revealed their orders for shrimp and fish in the Mumbai market alone was around a ton a day and touched 2 tons on weekends. The e-commerce orders and turnovers have only increased with the onset of the COVID-19 pandemic. Licious, Supre-seafoods, eSeafoods, Chennaiseafoods, and others are reporting brisk sales since online deliveries are a permitted activity in select states.

3.7. Coping strategies adopted by farmers and institutional support

The critical question for the policymakers is with a COVID-19 constrained export environment and with production for 2020–21 projected to be around 0.5 million tons of shrimp, can the domestic market absorb the product just in case export markets do not respond in the near future? Yes, it does appear it can and perhaps do more. The domestic market absorbs more than 0.1 millionton of farmed shrimp in a year at the moment. With about 70% of the Indians being non-vegetarians, the purchase of one kilogram of shrimp a year could absorb the entire production locally, leaving a large unmet demand. The range of prices for white shrimp in rupee terms lies between INR 200–600/Kg based on their size in the domestic market, which is reasonable to the buyer of an exclusive nutritious food item. Common fishes are priced around the same rate as that of shrimp in the market (ICC, 2020). In fact, shrimp is priced less compared to the cost of table fishes like pomfret, sea, and soabass. The domestic market is the alternative to the shrimp export market under the current circumstances. Besides a market waiting to be tapped, the shrimp farmers have the added advantage of avoiding all the hassles of seeking to wait for the exporters to pick up their produce. There is huge uncertainty as the demand has contracted in the importing countries. The COVID-19 lockdown has placed formidable impediment for the availability and free movement of export containers, refrigerated trucks and manpower to move consignments. The certification process needed for exports is also another requirement that needs to be surmounted, about which the domestic market may be a bit more relaxed.

Although it appears that the effects of COVID-19 pandemic on the shrimp exports could be managed through diverting the outputs of the shrimp farms to the domestic market in the initial lockdown days, such continued transition, exploration, and exploitation of a new market will take increased coordination and better institutional arrangements. What approaches have been successful in creating a domestic market for a commodity? In some cases, the product is enabled to reach the customer with the full support of the specific institutional arrangements laid down to streamline its promotion and sale. A typical example is that of Amul dairy products. The success of Amul model was enabled by the success of milk cooperatives. The model was driven by visionary leadership who also laid down forward linkages that ensured its continued strengthening and long-run success.

In most other cases, products make a strong presence in the market all by itself, and its market strides forward by the establishment of backward linkages. The typical example is shrimp. Commercial shrimp farming just kicked off in the early 1990s with culture activities starting by stocking wild shrimp post larvae in the ponds excavated along the Kandaleru creek, Nellore, Andhra Pradesh (Krishnan and Birthal, 1999). Hatchery seeds, formulated feeds, and other input markets developed around the initial thrust provided by shrimp culture activities (Krishnan and Birthal, 2002).

But the Covid-19 has allowed us to reflect on the advantages of developing an institutional architecture that can support the domestic market for farmed shrimp. The NFDB is in the best position to take the initiative to develop this market by identifying and supporting companies that have already forayed into selling shrimp locally. Reliance Delight Proteins and Metro Cash & Carry were the first off the blocks to find the niche market for fresh fish with expected margins upwards of 20% in the regular retail store format. Soon others followed in the same format, and supply chains were established through pre-contracted volumes and rates with shrimp and fish farmers mostly within the state. The online market also developed simultaneously, and some of them have been quite imaginative in their marketing strategies and formats.

The National Bank for Agriculture and Rural Development (National Bank) has several model bankable project proposals worked out for which assistance of various types are available. A cursory examination of these model projects reveals that fisheries have as many as 14 model bankable projects, including fish cold storage. Agri-business incubation units have also been established all over the country supported by the National Bank and by other schemes which help prepare viable business models for young entrepreneurs, which are then funded and mainstreamed with institutional finance. Except for a handful of mobile apps and other small-time projects that these incubation centers have promoted, much more thought has been given to exploring the possibility of developing an integrated plan for the creation of a domestic market for farmed shrimp in India.

The format of the market for the sale of shrimp within the country has become very important. Not only costs but also efficiency and margins can be enhanced if the supply chain to reach the final consumer is through e-commerce. Concerns of limited market have been raised in various quarters for the marketing of non-vegetarian items online as the consumers have always preferred to visit the local fish market or the butcher to get their weekly supplies. The rural consumer preference for online shopping has been growing leaps and bounds in the country with the availability of strong connectivity across the country. Youth in rural areas feel included in urban markets via e-commerce. But strategies need to change with times (KPMG, 2018). Hygienic handling, processing, packaging, and contactless delivery are trending.

It is interesting to note that there are only five listed aquaculture
companies in the Indian stock exchange. This is a significant indicator of unexploited opportunity for aquaculture to the gross domestic product of India. Significantly, 90% of shrimp farms in India are cultivated by marginal farmers, whose staying power and access to market is minimal. The advent of e-commerce and direct procurement of produce from the farmers have changed the stakes a little. Technology driven corporates have also entered the shrimp sector recently enabling seamless procurement, price discovery and efficient marketing. Corporate interest in Indian farmed shrimp is on the rise (Dash, 2020a, 2020b).

In a welcome development, the Department of Fisheries, Andhara Pradesh had recently commissioned a PricewaterhouseCoopers (PWC) survey to explore the opportunities for increase fish and shrimp consumption (PMU, 2021). PWC has recommended the establishment of the hub and spoke model at the districts level, that is self- sustaining and progressive both in terms of generating fish demand as well as for increasing fish and shrimp farmers income. This model has been discussed at length and is expected to yield the end results that would help fish and shrimp farmers not only to stave off any export market disruptions successfully but also increase their output to service the domestic market.

Therefore the domestic market for farmed shrimp is in the making. It just requires strong networking between the institutional agencies concerned, which should include developmental, financial, and marketing. The macro-scoping of the prospects of developing the domestic market, which should be able to absorb a substantial quantity of shrimp produced across all size groups needs to be a quick appraisal (Jagaraj, 2020).

4. Conclusions

Covid-19 presented both a challenge and an opportunity to the Indian shrimp sector. By revitalizing the institutional arrangements and redirecting the focus, the Indian shrimp sector can flourish just by adapting to the needs of the local demand, even when the export prospects are uncertain. Institutional agencies including MPEDA, NFDB and other state agencies, including the Andhra Pradesh Aquaculture Authority established recently, are moving in now, creating and promoting the domestic market for shrimp. The All India Shrimp Farmers Association similarly are doing well to launch a concerted effort to develop an organized structure for enabling the production and sale of shrimp in the domestic market, through e-commerce and retail store format. The industry associations like Confederation of Indian Industries (CII) and Associated Chamber of Commerce and Industry (ASSOCHAM) are taking a fresh look at the possibilities of a new line of investments to promote and sell Indian shrimp in the domestic market. There should not be any apprehension of falling incomes and layoffs as the IT industry leaders are very positive of the sector bouncing back strongly. This is the best time for the shrimp farming sector to reorganize itself not only to create a domestic market but also to get ready to meet surges in export demand that is waiting to happen in the near future once we get out of this pandemic crisis. With abundant unutilized brackish water area waiting to be exploited in the country, India would have a booming domestic market as well as remain the undisputed leader in shrimp exports. Due to increasing local demand for shrimp, there is lot of room for Pandian and his fellow aquaculture farmers to play in the domestic market, even when the export market picks up later – perhaps one of very few positive outcomes of the Covid-19.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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