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📍 Visakhapatnam, India

Fish Markets in India Are Driven by Bycatch and Sustained by Subsidies

Bycatch and waste fish are increasingly being used for fish meal and fish oil in India, changing how fishers make money and incentivizing unsustainable fishing methods. Is there a way out?

Mongabay India



Monika Mondal | 14 October 2021

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Twenty years ago, when Gurul Mangellipeli (45) used to go fishing, he would find many varieties of fishes such as *pulusa* (Indian shad), *erameenu* (Emperor), *karava* (Lethrinus) and more, just 20km from the shoreline. “Now the fishes are to be brought from at least 150-300 km away from the coast,” he complains as he docks his boat next to a line of other mechanised boats in hues of yellow and blue at the fishing harbour in Visakhapatnam, Andhra Pradesh (AP).

Located on the east coast of India, Visakhapatnam (colloquially known as Vizag) is a busy city with high-rise residential and commercial buildings facing the sea. The once-fishing village is now dotted with petrochemical and pharmaceutical industries. Yet, fish and fishing remain central to Vizag’s economy. When it comes to marine exports, Vizag port is considered one of the top contributors. AP is the [largest exporter](#) of fish and shrimp in the country.

According to the [Handbook on Fisheries Statistics](#) of 2020, India’s fishery sector has been growing steadily, led largely by an increase in aquaculture production, which blossomed only in the last two-three decades, with a growth rate of [over 10%](#) year-on-year. The Government of India seeks to promote aquaculture, or the cultivation of targeted commercial fishes in ponds and inland water bodies, under its Blue Revolution scheme. [One of their narratives](#) has been that this would ease the pressure on fast-depleting resources of wild fish species. However, [recent reports and studies](#) suggest that, since many of the farmed fishes feed on wild-caught fishes, aquaculture supplements marine capture and leads to the further exploitation of marine resources.

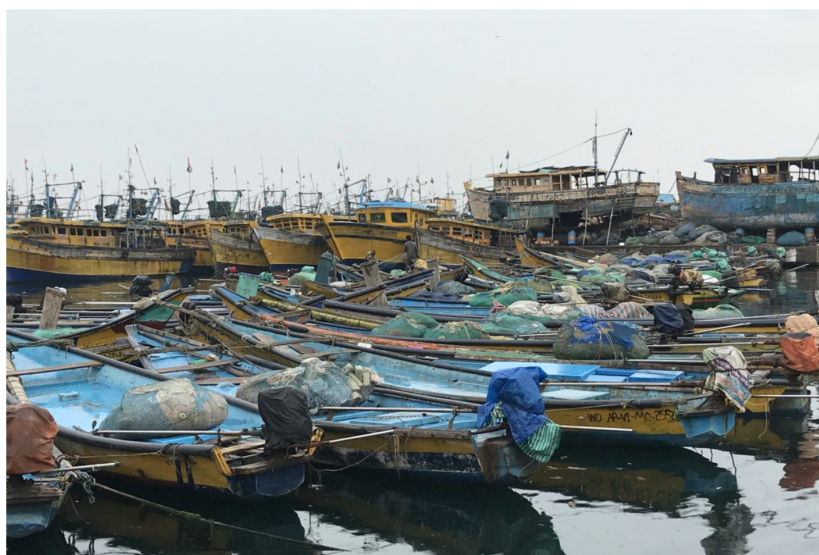
Joeri Scholtens, an associate professor at the University of Amsterdam with expertise in fisheries governance in South Asia, comments on the rate of growth in India’s aquaculture business, saying, “An important factor in making this possible is the accessibility of fishmeal and the marine

“An important factor in making this possible is the accessibility of subsidies and the fishing subsidies.”

Churning profits from waste fishes

“Once upon a time (during the 1980s), the Vizag fish harbour hosted about 100 boats, now the count has reached 750,” says PC Apparao, President, AP Mechanised Fishing Boat Operator’s Association. According to Apparao, “the pollution from the nearby industries has already killed fishes and led to the depletion in catch.” “On top of it”, he adds, “if many fishing fleets compete for the limited fishes in the ocean, you can imagine the pressure on the fish stocks.”

Things began to change drastically after the 2004 Tsunami, noted Dr S Sandilyan, former fellow on Invasive Alien Species (IAS) at the Centre for Biodiversity Policy and Law (CEBPOL), National Biodiversity Authority (NBA). Sandilyan is based in Chennai, the capital of neighbouring state Tamil Nadu, and fifth largest fish producer in the country. “Aid which followed the disaster, unintentionally made deep sea trawling feasible. The money which came from government, NGOs and international agencies to rehabilitate the fishers, also helped them to buy better mechanised fibre boats replacing the traditional (Catamaran) boats. While earlier three-four fishermen shared a boat, now almost everyone has one, leading to overexploitation of marine resources,” he says.



Boats parked in Vishakapatnam fishing harbour / Credit: Monika Mondal.

Looking back on his earlier fishing days, Apparao recollects: “Earlier, with 300 litres of fuel, we could capture 150-200 kg of fishes within 2-3 days. And now, we spend over 3,000 litres of diesel for 15-20 days (or more) and still fail to capture the same quantity of fish.” While Apparao laments about the unprofitability of the fish business, another fisherman named Dania and his team of seven reach the Vizag port. Each of the labourers on the boat said they secured an income of Rs. 5,000 and about 48 kg of fish — as a result of their 25 day-journey at sea. Dania boasts that they have captured a lot of fishes from somewhere near Bangladesh.

While this crew of seven, roams around the boat and observes their haul, another crew gets busy segregating the collection — into big commercial fishes (targeted fish catch), which will be auctioned, and the other small, juvenile, wild and waste fishes, which cannot be sold in the market. Anything that does not go for auction, is often termed as waste or bycatch.

“Waste fishes have been used in other industries like poultry or pig farming for a long time. However, it is only in recent years that these bycatches are extensively being routed to Fish Meal and Fish Oil (FMFO),” says Natasha Hurley, Campaign Manager at Netherlands-based Changing Markets Foundation (CMF), a global campaigning organisation formed to accelerate and scale up solutions to sustainability challenges.

As per a study in 2020, one third of the entire marine landings in India goes to the fish meal industry. “The other two third goes to exports, domestic supplies and other industries like agriculture, fertiliser, poultry and other animal feeds,” informs Scholtens.

“Fishers can no longer solely rely on their traditionally targeted seafood species that were destined for human consumption. To stay profitable, they cannot afford to discard the low value bycatch “trash fish” they traditionally did and need to land all they can. This continues to drive overfishing in the region, beyond the collapse of their targeted stocks,” says Aaron Lobo, a marine conservation scientist based in Goa.

Marine ecosystem, demand, and supply

“The practice of catching small and juvenile fishes has picked up pace only in the last 10-15 years,” says Dr. K Sunil Mohamed, Retired Principal Scientist and Head of Division, Central Marine Fisheries Research Institute, a government agency under the Ministry of Agriculture and Farmers’ Welfare and Chair, [Sustainable Seafood Network of India \(SSNI\)](#). The juvenile fishes are caught before they’ve had the chance to grow and reproduce; this leads to the depletion of fish stocks.

The collapse of fish stocks is already visible among some of the pelagic fish species, like oil sardines. In 2012, oil sardines were at the peak of their exploitation. Dr. Mohamed says, “Sardines comprised 30% of all the catches all over India that year, with 0.8 million tonnes of sardines landed on Indian coasts.” The decline became prominent in the following years, he adds.



Fishermen feeding the fish in the aquaculture farm / Credit: Monika Mondal.

Sardines play a crucial role in the food security of locals in states such as Goa, Kerala and Karnataka. “The cheap source of essential fatty acids and protein suddenly became out of reach for the poor,” notes Mohamed. About 90% of fish that is used in FMFO could be used for human consumption. A recent report titled, “[Fishing for Catastrophe](#),” by CMF found that significant quantities of fish that could be consumed directly by people are instead being diverted to fishmeal plants along the Mangalore–Karwar belt on the West Coast of India.

According to Mohamed, “The growth of shrimp farming has triggered a rise in reduction fisheries.” He is referring to the phenomena where fish of good human food value is reduced to meal for export-oriented aquaculture fishes for high economic worth.

This has implications not just for humans, but for other marine species as well. FMFO used in aquafeed uses small plankton-eating fishes which are present in abundance (like sardines, anchovies, mackerel and herring) and crustaceans (mainly krill). “These fishes are at the bottom of the food chain, and are a critical link in marine food webs,” says Dr. Mohamed.

“Depletion of any fish sources may further lead to loss of other fish species including the endemic ones, and can disrupt the whole marine ecosystem,” adds Dr. Sandliyan.

Yet, demand is set to outpace supply. Talking about the demand of fish feed in the aquaculture industry, Dr. BM Hasan, General Manager at Anmol Feeds Pvt Ltd, headquartered in Kolkata, says, “It’s about 1 million metric tons (MMT) per year.” He adds, “The fish feed industry in the country is growing at a very fast pace with a growth rate of 10% every year.”

For the production of export-oriented products like shrimp, we need more and more fish (or bycatch) for shrimp to feed on. Research based on data from local industries suggests that the feed conversion ratio (FCR) of whiteleg shrimp is 1.2-1.6 kg feed input per kg shrimp output. Moreover, production of each kg of fishmeal requires 4-5 kg of waste/wild fishes.

“Soya is an alternative to this protein source but it is considered a vegetarian protein. For carnivorous fishes and shrimp— fish meal or squid meal or polychaete worms meal is needed for better growth and survival,” says Hasan.

Driven in large part by aquaculture, the total fish production in India has increased from 0.75 MMT in 1950-51 to 14.2 MMT in 2019-20. During the financial year 2020-21, the fisheries sector witnessed challenges due to the pandemic, yet, India exported 11,49,510 MT of seafood worth US\$ 5.96 billion. Out of which, cultured shrimp continued to be the major exported item. Out of a total production of 8,43,361 tons of Shrimp (Tiger + Vannamei), India exported 5,52,019 tons (65%) of shrimps to countries like USA, China, South East Asia, Japan and Middle East.

The wheel that runs India’s exponential growth in aquaculture

According to Scholtens, the growth in the prawn industry relies heavily on affordable feed, which requires cheap fishmeal and precarious labour. He warns, “As soon as fishing regulations are fully implemented, as soon as the fuel subsidies are removed, or the fishing labourers are paid a decent wage, the prawn industry might be in big trouble.”

“Subsidies can lead to overfishing and over-exploitation of fishery resources. For instance, subsidies for fuel (petrol and diesel), nets and other machinery allow fishers to increase the number of fishing trips they take, which ultimately leads to the depletion of fish biomass. If they pay the right [full] price for the fuel they might not go as frequently as they are going now,” says Sandilyan. Apparao and other fishermen in AP get a monthly fuel subsidy of Rs. 9 per litre with a ceiling upto 3000 litres.

Mohamed explains, “The subsidies vary depending on the state and with a mix of support from center and the state.” States like Karnataka, Andhra Pradesh, Tamil Nadu, Maharashtra give subsidies on diesel fuel, whereas the Kerala government gives subsidies for kerosene. (Mohamed also observes that kerosene is a polluting fuel, however, it supports only small-scale farmers with comparatively smaller boats.)



Fishermen want more subsidies and support from the government to adopt more sustainable fishing practices / Credit: Monika Mondal.

“The fisheries subsidies that Indian fishers get are minuscule when we compare with the West,” says Mohamed. India subsidises around \$174 million for capacity enhancement, in the form of fuel, boats, nets etc. The top three countries are — China (fisheries subsidies worth \$ 5.886 million). EU

(\$ 2,036 million) and the USA (\$ 1,136 million). Mohamed is optimistic about “new regulations coming up, especially in terms of net size, mesh sizes and minimum sizes of fishes,” that should all help reduce bycatch, but he also notes that India is a huge country, and the regulations are difficult to implement properly. According to him, the government should focus more on welfare subsidies — for education, housing, health etc. Fishermen are one of the most economically vulnerable groups in the country. In 2018, the average monthly salary of fishermen was reported to be Rs. 4,387.78 (- \$59). As Dania and his peers at the Visakhapatnam harbour shared, that figure has stayed nearly the same in 2021.

The fish meal industry and the fisherfolk

There are no particular laws to regulate the FMFO industry. There is hardly any discrimination among the type of fishes delivered to these industries — be it fishmeal, which produces feed for industries like poultry, pigs, fishes etc, or fish feed, produced only for fishes, or fish oil. While only 6% of feed is imported, India exports about 25% of fishmeal.

Until 2020, 45-60 fishmeal companies were operating in India, the majority of which were located in Karnataka. Since the 1970s, the exports and capacity of the fishmeal plants have increased by 100 times. According to the Government of India, since 2015, 199 fish feed mills have been established in the country, with Uttar Pradesh (55) topping the list, followed by Maharashtra (42) and Madhya Pradesh (24). India's fish feed or aquafeed market has been valued at US\$ 1.20 billion (2017).



Fishermen load farmed shrimps / Credit: Monika Mondal.

Though Hasan, the manager at the aquafeed company, mentions that there will be further growth in the fish feed industry, he also agrees, “The FMFO industry was considered a solace for fishermen as it purchased the trash and non-edible fish that came in with the catch. It has been noticed tons of fish, including juvenile and edible ones are being processed by the industry, resulting in the collapse of fish stocks and marine ecology, imbalances in food security and severe environmental issues.”

Apparao and other fishermen have similar feelings that their fishing methods are not very sustainable, but they have limited choice. He has a message for the government. He says, “They should make sure our businesses are not unprofitable. Support us with subsidies but limit the grantees. Limit the boats that go to the sea. Put moratorium limits and support us so that we leave the ocean undisturbed and can fish sustainably when we go back.” While Apparao puts his demand in a strong voice, other fishermen surround him and agree with nods and whispers and soon disperse around the harbour.

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