

A Report on Major Fishing Harbors of Coastal Karnataka and their Fish Catch Profile

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Background to the Report

Karnataka is endowed with a 313.02 km long coastline and a continental shelf area of 27,000 square kilometers. Marine fisheries resources of the state play an important role in ensuring food and nutritional security to vulnerable sections, employment generation, and export revenue earnings. There are three coastal districts in Karnataka (Dakshina Kannada, Udupi and Uttara Kannada), where 3,28,000 fishers are engaged in marine/coastal fishing and allied activities such as fish processing and marketing. The state produced 4,03,000 metric tons (MT) of marine fish, earning a valuable ₹1367.13 crores revenue through marine exports in 2019-20.

Fishing harbors and harbors are the places where most of the marine/coastal/estuarine fish harvests are pooled from fishing boats/units. There are 8 fishing harbors/ports, 16 fish landing centers and jetties, and 91 *beach landing centers* along the Karnataka coast. The major harbors are: Mangaluru (in Dakshina Kannada); Malpe and Gangolli (in Udupi); and, Mavinakurve/Bhatkala, Kasara koda/Honnavaara, Tadadi, Belekeri, Amadalli, and Karwar Baithkhol (in Uttara Kannada). Figure 1 shows the location of these nine harbors on the map of Karnataka. This report presents the analysis of data on species-wise quantities of fish landed, collected at a daily frequency from these harbors. The data were collected by the Karnataka office of the Network for Fish Quality Management & Sustainable Fishing (NETFISH), a society registered under the Marine Products Export Development Authority (MPEDA) of the Ministry of Commerce & Industry, Government of India. NETFISH generously shared the data with Azim Premji Foundation, Bengaluru, for analysis. Data for the Amadalli, Belekeri and Mavinakurve harbors cover the two-year period from January 2019 to December 2020, while for the rest of the harbors the time span of data is the four-year period from January 2017 to December 2020. Apart from the landings data, we provide some basic description of the harbor and the fishing village, using data obtained from the Marine Fisheries Census 2016 of Karnataka conducted by the Central Marine Fisheries Research Institute. These descriptions include the fisher population statistics and the number and types of fishing craft/boats.

Harbors and harbors can be considered to be the backbones of the seafood value chain in India, whether it is for the domestic market or for export purposes. Therefore, they need to be properly maintained with the requisite infrastructure and facilities. In this regard, this report presents the status of infrastructure in these centers.

A brief description of the NETFISH data collection procedure

NETFISH collects data on fish landings in major harbors. The data are unique in the sense that these can be thought of as census of fish landings carried out throughout the fishing year. Harbor Data Collectors (HDCs), who are NETFISH employees, visit their designated harbors daily to collect fish landings data. During their visits the HDCs collect species-wise data on fish harvests directly from all mechanized fishing craft for that trip as they land at the harbor (i.e., real-time data). If for any reason the HDCs are unable to collect data when boats arrive, they estimate the catches from secondary sources such as crewmembers, or sources at the harbor diesel bunk, or fisher union members. Thus, the NETFISH data can be termed the most comprehensive and accurate real-time data on fish landings at the major harbors of Karnataka.

Apart from collecting the harvest data, NETFISH also collects log-sheets from registered fishing vessels, and intends to develop a state-of-the-art traceability system for seafood products. Such a traceability system is becoming an increasingly common feature of not only international trade of agricultural/meat/seafood products, but also in domestic markets.

Acknowledgements

The authors thank generous support of the NETFISH team for data, photographs and harbor-related supplementary information. Photos of the harbors are presented in the report, and credits of photos used go to NETFISH. The authors acknowledge the cooperation from NETFISH Karnataka HDCs, Mr. Yashwin Bengre (Mangaluru), Ms. Shruthi Kunder (Malpe), Ms. Saraswathi (Gangolli), Ms. Pratiksha Kharvi (Mavinakurve Bhatkala), Ms. Alphonsa Fernandes (Kasara koda, Honnavara), Mr. Santhosh H (Tadadi), Mr. Chetan Uday Naik (Belekeri), Mr. Sudheer Gouda (Amadalli) and Mr. Prashan Salaskar (Karwar Baithkhol).

The authors thank the Dried Fish Matters (DFM) project and the Social Sciences and Humanities Research Council (SSHRC) of Canada for the funding support.

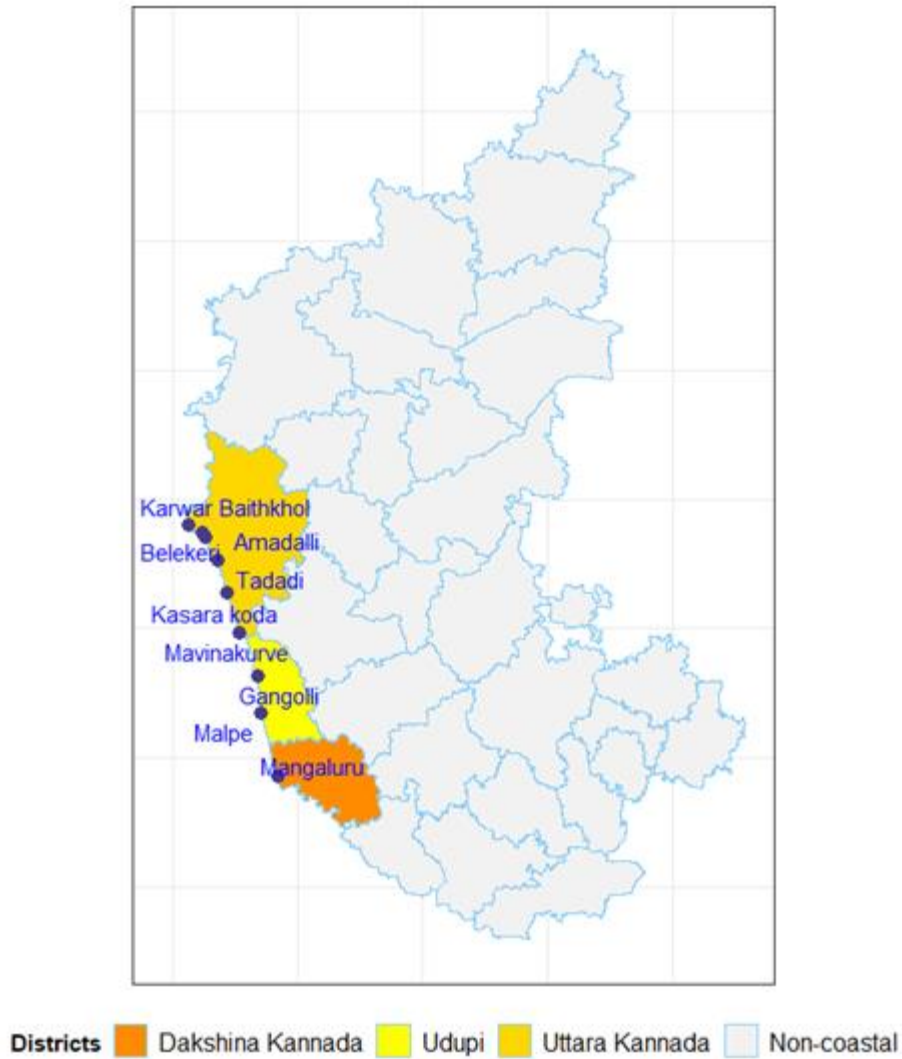


Figure 1. The Nine Major Fishing Harbors of Coastal Karnataka.

Analysis of fish landings

Overall trends in fish landings

Figure 2 shows the annual totals of fish landings aggregated across all species and harbors. Out of the four years, highest landings were in 2017 and from then on, the landings have declined steadily.

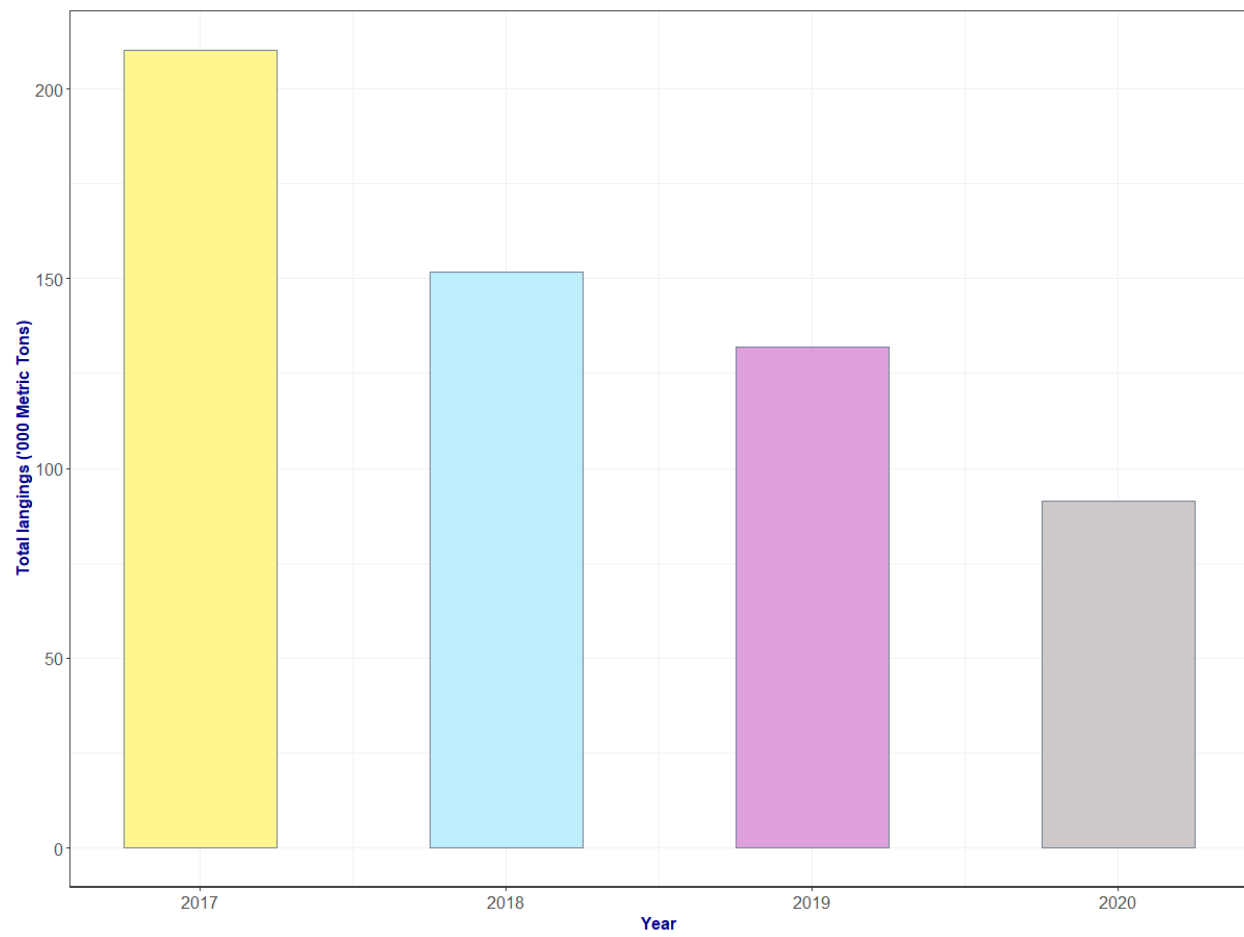


Figure 2. Annual fish landings summed across all species and harbors: 2017-2020.

Figure 3 shows the share of each harbor in the quantity of annual total fish landings. Each grid of the figure represents a harbor, and are arranged by rows alphabetically. Mangaluru and Malpe have largest shares, together receiving about 70 to 80 percent of total landings. Fishing harbors in Uttara Kannada have much smaller shares, compared to Malpe and Mangaluru.

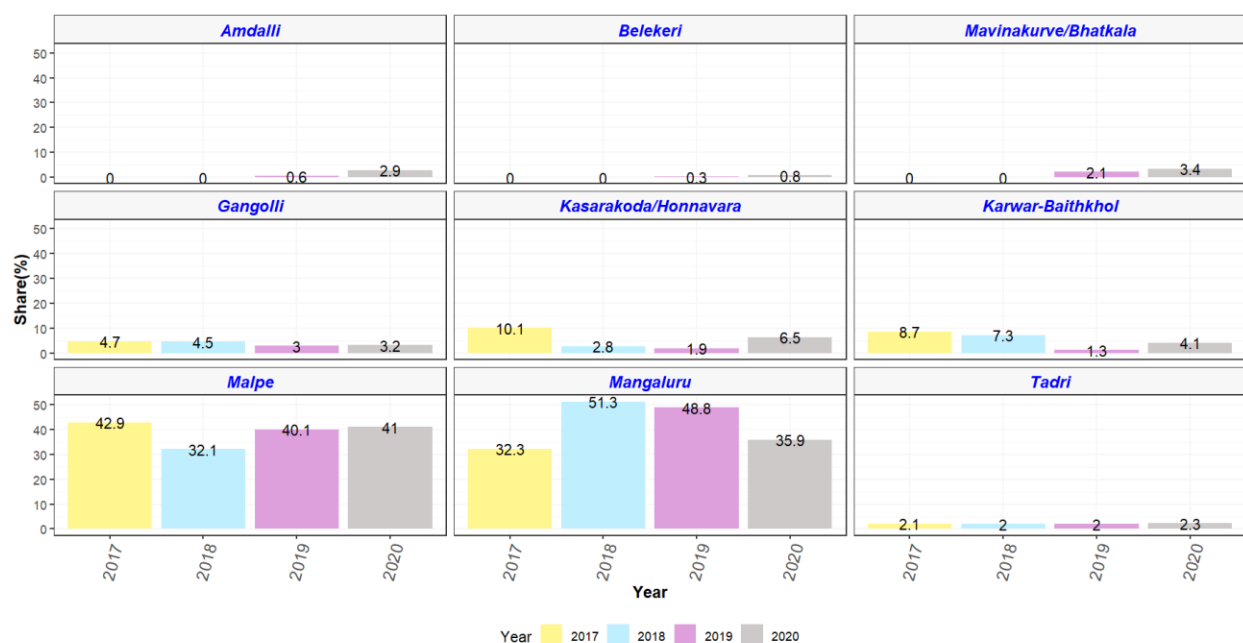


Figure 3. Percentage share of individual harbors in total annual fish landings: 2017-2020.

Figure 4 shows the top-20 fish species/products in terms of quantities landed aggregated across all harbors and broken-down into annual quantities. The grids in the figure show individual seafood products and their annual landings, and have been arranged row-wise in descending order of cumulative landings. For example, Sardines occupy the first rank in terms of cumulative landings, whereas Squids occupy the sixth position in the top-20 products. While Sardines are ranked at the top, their catches have not been uniform over the years, with what appears to be abnormally high landings in 2017 and abysmal catches in 2019 and 2020. Mackerel occupies the second rank, and also tends to show variable catches over time. A rather surprising entry is the Filefish, specifically the red-toothed filefish/triggerfish (*Odonus niger*), a fish inhabiting reefs and shallow inshore waters. The filefish was landed at large quantities in 2019. Most of these products in top-20 are commercially important for the export market and for domestic consumption. “Trash” fish catches form the fifth largest group, while “Mixed” species landings form the 14th largest group in the cumulative top-20 list.

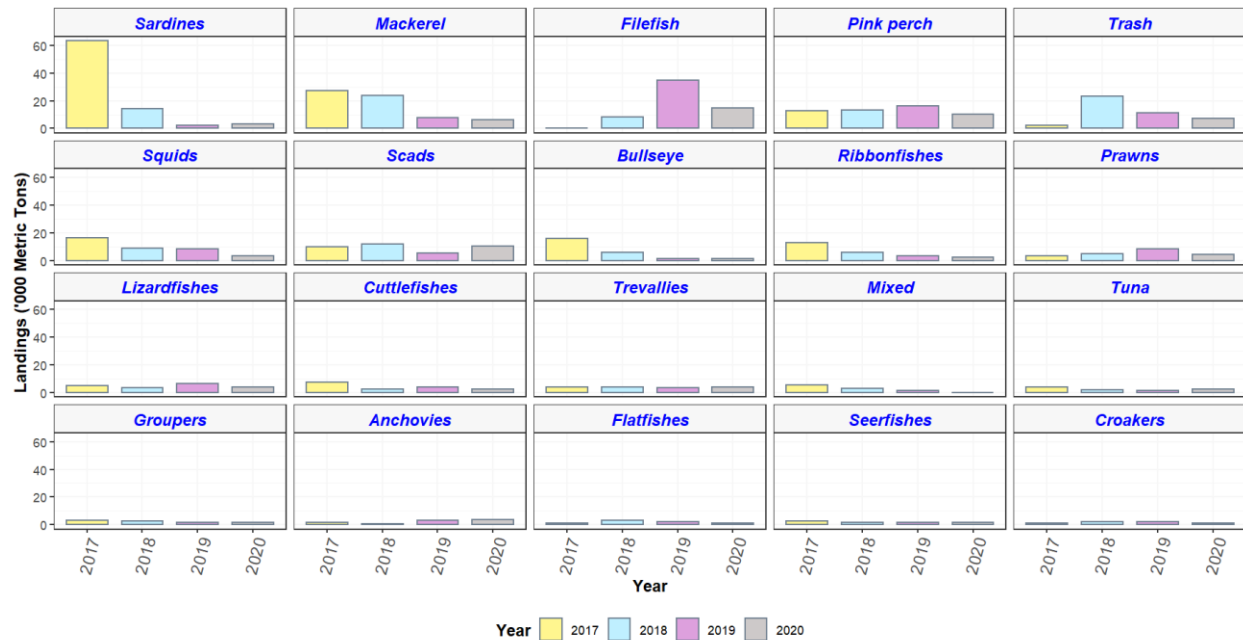


Figure 4. Top-20 fish species/products landed, in terms of cumulative landings between 2017 and 2020.

Trends in fish landings at Major Harbors

In this section, we describe patterns in quantities of fish landed at each harbor. We analyze annual total landing quantities at each harbor, monthly/seasonal patterns, and top-20 species caught in the harbor in terms of four-year cumulative landings together with their annual landing quantities.

Karwar Baithkhol Harbor

Some salient features of the Karwar Baithkhol Harbor

The Karwar Baithkhol Harbor was developed under the Indo-Danish project in 1975 at Baithkhol in Karawara taluk, Uttara Kannada. Initially the harbor had a wharf of 100m length which was extended to 290m in 2017 and includes facilities such as an ice plant and diesel bunks. There are 1,312 fisher families in the Karawara municipal area fishing village with a total fisher population of 4,905, of whom 1,372 are active fishers. There are 256 fishing craft in the Karwar Baithkhol Fishing Harbor, all of which are mechanized (150 trawlers and 106 purse-seiners). Figure 5 shows some glimpses of the Karwar Baithkhol Harbor.

Description of fish landings at the Karwar Baithkhol Harbor

1. Panel A of Figure 6 shows the year-wise fish landings at the Karwar Baithkhol Harbor from 2017 to 2020. Highest catches were recorded in 2017 and the lowest were in 2019.

2. Panel B of Figure 6 shows the monthly fish landings between January 2017 and December 2020 at Karwar Baithkhol Harbor. Peak landings occur during the cooler months of November to January. In 2019 there were no landings in the months of January to March.
3. Panel C of Figure 6 shows the top-20 species in terms of the 4-year aggregate landings, and also the respective year-wise breakdown.
 - a. Sardines are ranked first, with massive landings in 2017. However, in 2019 and 2020, sardine landings in Karwar Baithkhol were a miniscule compared to that in 2017.
 - b. Smaller pelagic fish (Sardines, mackerel, scads, herrings) make up much of the top-10 species.

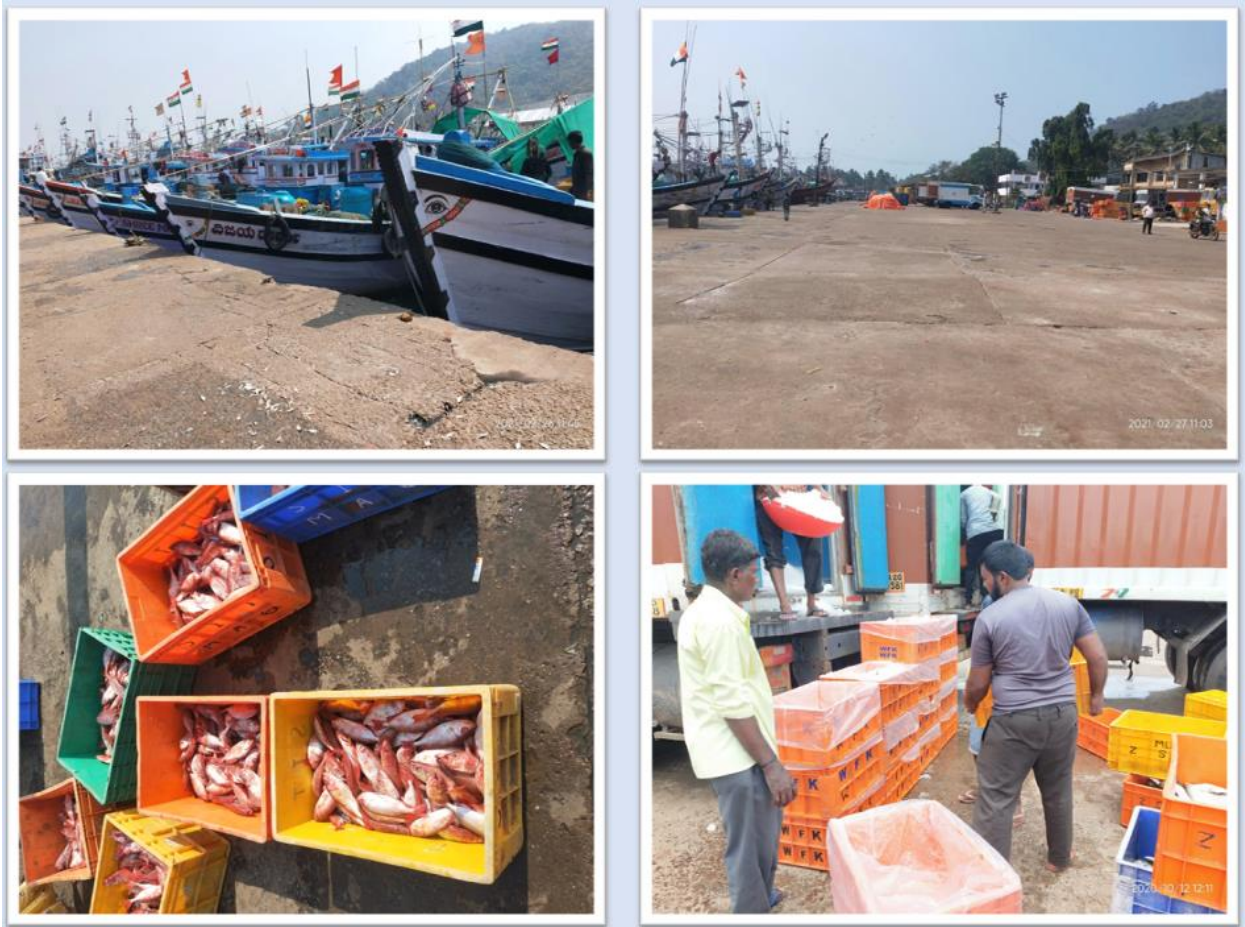


Figure 5. Some glimpses of the Karwar Baithkhol Harbor.

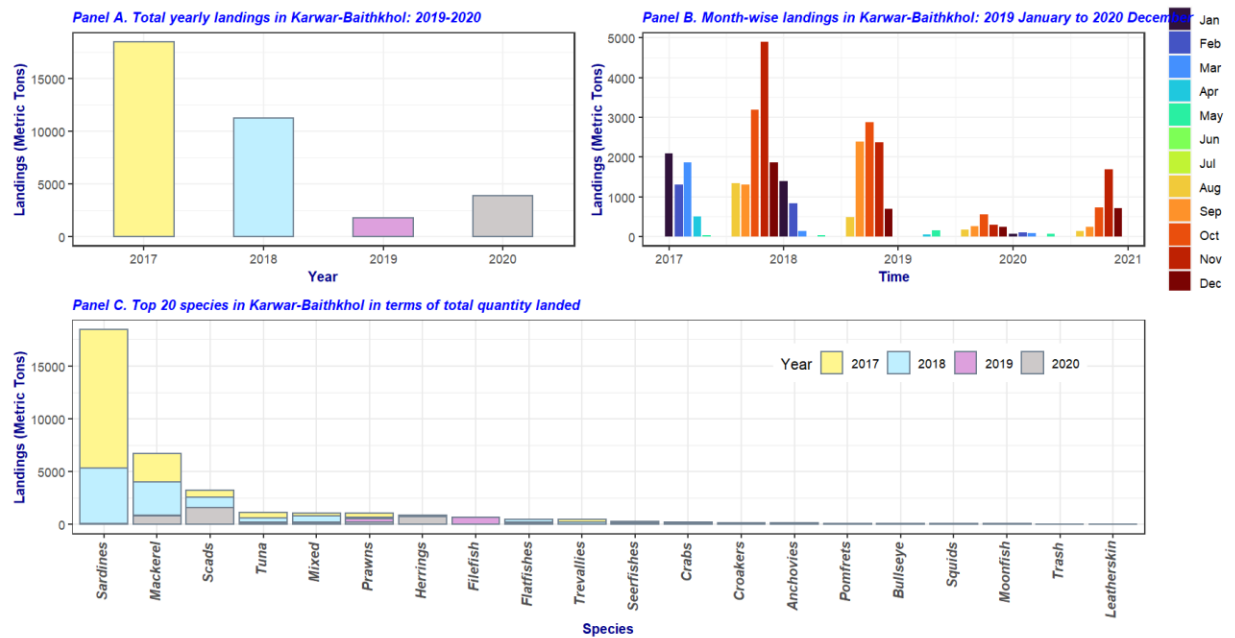


Figure 6. Fish landings at the Karwar Baithkhol Harbor: January 2017 to December 2020.

Amadalli Fish Landing Center

Some salient features of the Amadalli Fish Landing Center

The Amadalli Fish Landing Center is situated in Karwar taluk, Uttara Kannda. It is located at about 24km south of Karwar city. The harbor was constructed in 2008 to provide fishing infrastructure for fisher families displaced by Project Seabird at Karawara. There is a 270m long jetty in the harbor, and the available facilities include a fish auction hall, ice plant, diesel bunk, a fishing vessel repair center, a fishing gear shed, a fish drying yard, and a storage unit for boat equipment/parts. There are 724 fisher families in Amadalli, with a total fisher population of 2,568 of whom 689 are active fishers. There are 157 fishing craft in the Amadalli Fish Landing Center of which 41 are mechanized (38 trawlers and 3 purse-seiners), 96 motorized craft (35 with inboard engines, and 61 with outboard engines), and 20 non-motorized boats. Figure 7 shows some snapshots of the Amadalli Fishing Harbor.

Description of fish landings at the Amadalli Fish Landing Center:

1. Panel A of Figure 8 shows the annual total fish landings at Amadalli for 2019 and 2020. In 2019 only incomplete data are available for Amadalli.
2. Panel B of Figure 8 shows the monthly total catches. In both 2019 and 2020 there are limited quantities of fish being landed during the months of June and July when fishing is banned for all boats over 10 horsepower engine capacity. These landings could be of the fish harvested by subsistence and artisanal fishers. Peak fishing appears to be in the November month.
3. Panel C of Figure 8 shows the top-20 fish in terms of quantity (metric tons, MT) landed at Amadalli aggregated over the two-year period.
 - a. There are several pelagic coastal shallow water fish species such as Scads, Herrings, Mackerel, Sardines, and Moonfish that appear in the top-10. These species are important for the domestic market, both as fresh fish and as processed products such as dried/cured fish.
 - b. Only a limited varieties of demersal species (e.g., flatfishes, croakers, squids, crabs) appear in the top-20 list.

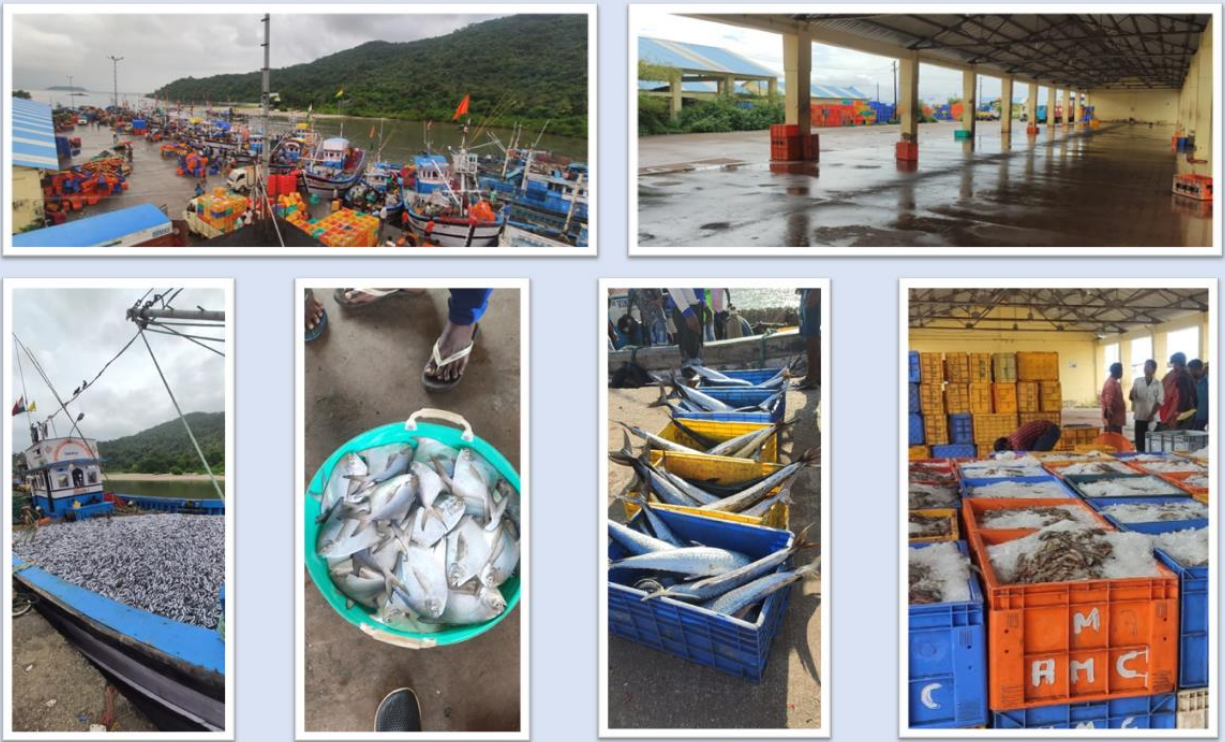


Figure 7. Some glimpses of the Amadalli Fish Landing Center.

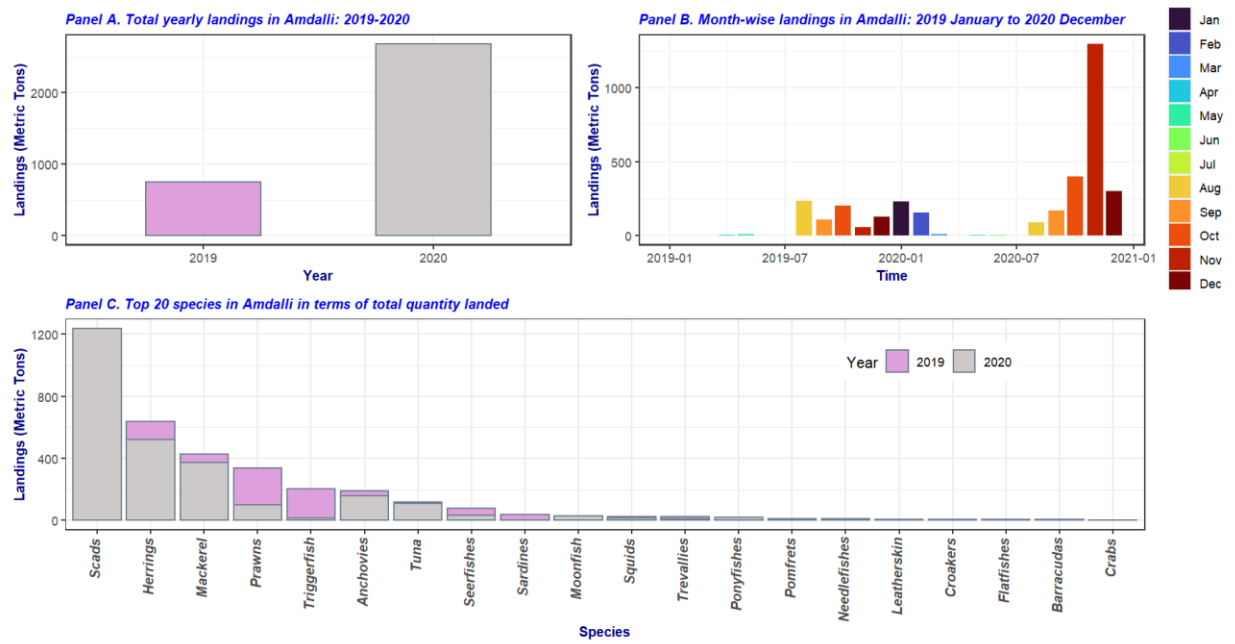


Figure 8. Fish landings at the Amadalli Fishing Harbor: January 2019 to December 2020.

Belekeri Harbor

Some salient features of the Belekeri Harbor

The Belekeri Harbor is located on the banks of the Hattikeri river in Ankola taluk of Uttara Kannada. The harbor has a 450m long dock. Facilities available in the harbor include a fish auction hall, diesel bunk, storage room for machineries, and a fish drying yard. There are 553 fisher families in Belekeri with a total fisher population of 2176 of whom 658 are active fishers. There are 144 fishing craft in Belekeri Harbor, of which 67 are mechanized (all purse-seiners), 77 are motorized (22 fitted with inboard engine, 55 fitted with outboard engine), and no non-motorized boats. Figure 9 shows some glimpses of the Belekeri Fishing Harbor.

Description of fish landings at the Belekeri Harbor

1. Panel A of Figure 10 shows the annual total quantities of fish landed at the Belekeri Harbor for 2019 and 2020. As with Amadalli, only limited and irregular fish landings were recorded in 2019 in Belekeri too.
2. Panel B of Figure 10 shows that peak fishing season is during November and December months. Summer months of March to May had zero or very little fish landings. Absence of fish landings during Monsoon (June/July) may indicate that fish brought by small non-motorized boats are not landed at this harbor, but may be in beach landing centers.
3. Panel C of Figure 10 shows the top-20 species landed at the Belekeri Harbor in terms of two-year cumulative quantities landed. Similar to Amadalli, there is a preponderance of small pelagic coastal species such as Herrings, Anchovies, Scads, Sardines, and Mackerel in the top-10 list.



Figure 9. Some glimpses of the Belekeri Harbor.

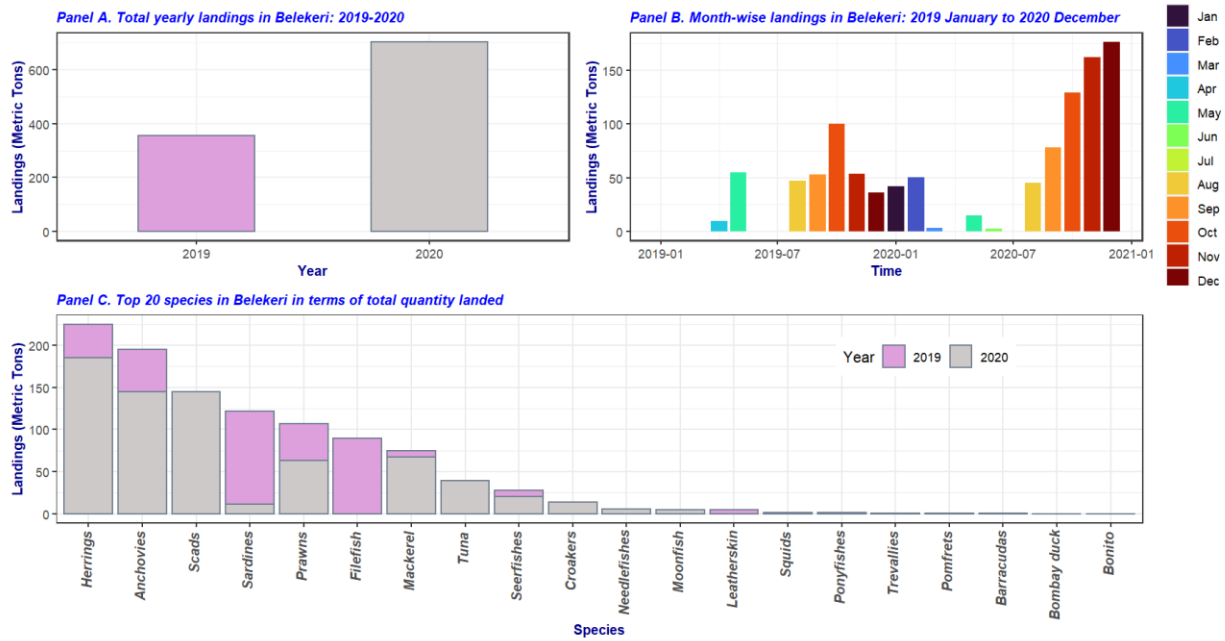


Figure 10. Fish landings at the Belekeri Harbor: January 2019 to December 2020.

Tadadi Harbor

Some salient features of the Tadadi Harbor

The Tadadi Harbor is located at the mouth of the Aghanashini river in Kumta taluk, Uttara Kannada district. The Tadadi Harbor is spread over an area of about five acres. It has a 200m long wharf and the facilities available include a designated fish auction building, an ice plant of 20 tons/day capacity, a freezing plant, a boat repair center and warehouse for fishing gears. There are 90 fisher families in Tadadi village with a total fisher population of 417 of whom 122 are active fishers. There are 329 fishing craft in Tadadi Harbor, of which 234 are mechanized (115 trawlers, 18 gillnetters, and 101 purse-seiners), 55 are motorized (all with outboard engine), and 40 non-motorized boats. Figure 11 shows some glimpses of the Tadadi Harbor.

Description of fish landings at the Tadadi Harbor:

1. There is a clear gradual decline in total quantities of fish landed at the Tadadi Harbor over the 2017-2020 period, as can be seen from Panel A of Figure 12.
2. A closer look at Panel B of Figure 12 indicates that there was an unusual spike in landings in November 2017. In all the years, peak fishing in terms of total landings takes place during the months of November to January.
3. Panel C of Figure 12 shows the top-20 species/seafood of Tadadi in terms of cumulative landings over the four-year period, and their annual landings.
 - a. Sardines occupy the top rank in terms of cumulative landings over the four years. The catches of Sardines in Tadadi were substantially higher in 2017 compared to the other years. Landings of sardines were higher in 2017 and 2018 but declined strongly in the next two years.
 - b. Prawns/shrimp, “Trash fish”, Mackerel, and Tuna occupy the next four ranks in the top-5, with almost similar cumulative landings over the four-year period. Prawns and tuna have a more uniform annual landings than mackerel and “trash fish” which tend to show more variation in annual landings.
 - c. Flatfishes also are important components of Tadadi’s landings.
 - d. Pelagic fish such as herrings, trevallies, scads, anchovies are among the top species landed in Tadadi.



Figure 11. Some glimpses of the Tadadi Harbor.

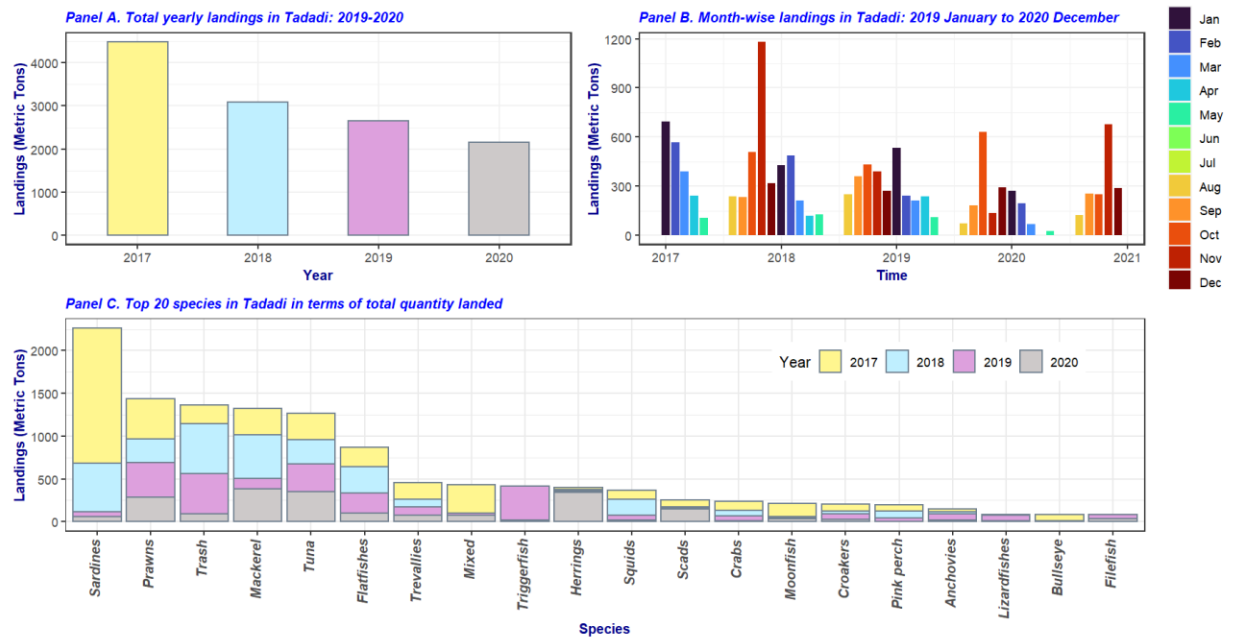


Figure 12. Fish landings at the Tadadi Harbor: January 2017 to December 2020.

Kasara koda Harbor

Some salient features of the Kasara koda Fishing Harbor

The Kasara koda Harbor is situated on the banks of river Sharavati in Honnavara taluk in Uttara Kannada district. The first phase of modernization of fishing harbor was completed in 1984 with a 200m long wharf, which was extended by 503m in 2014. There is fish auction hall, an ice plant, diesel bunks, fishing gear storage rooms, gear mending rooms, and a boat repair shop. However, smaller boats are usually found docked in an unpaved section of the riverbank. There are 752 fisher families in the Kasara koda fishing village with a total fisher population of 3736 of whom 113 are active fishers. There are 305 fishing craft in the Kasara koda Harbor, of which 158 are mechanized (83 trawlers and 75 purse-seiners), 47 are motorized craft fitted with outboard engine, and 100 non-motorized craft. Figure 13 shows some glimpses of the Kasara koda Harbor.

Description of fish landings at the Kasara koda Harbor

1. Panel A of Figure 14 shows the annual total fish landings at the Kasara koda Harbor for the four years from 2017 to 2020. Year 2017 was an excellent year in terms of fish landings, compared to the rest of the years which had substantially less landings.
2. Panel B of Figure 14 shows monthly landings from January 2017 to December 2020. There were some months with exceptionally good fish landings, namely January, September, October and November. In general, fish landings were the highest during the cooler months, and lower during the summer months.
3. Panel C of Figure 14 shows the top-20 species landed, with annual break-downs, in Kasara koda in terms of total landings aggregated over the 4-year period.
 - a. Sardines are the most landed fish, with unusually strong catches in 2017 which did not materialize in the subsequent years.
 - b. There are several pelagic species in the top-10 list, and several demersal species appear in the lower ranks.

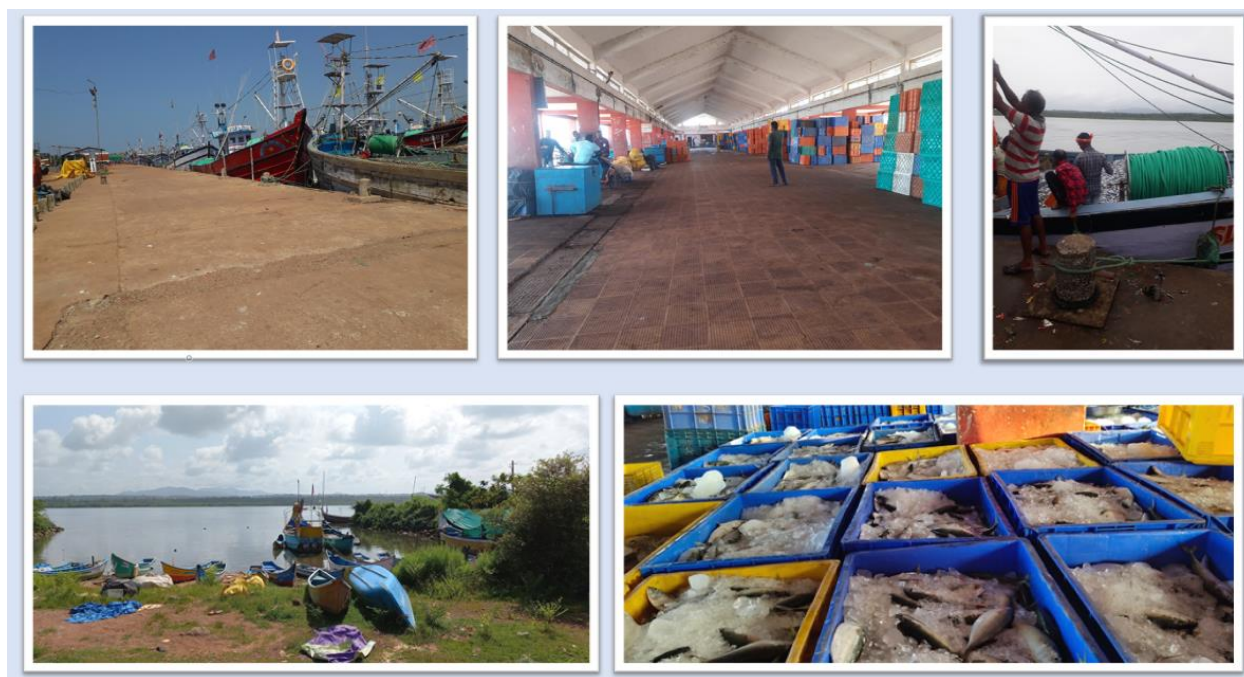


Figure 13. Some glimpses of the Kasara koda Harbor.

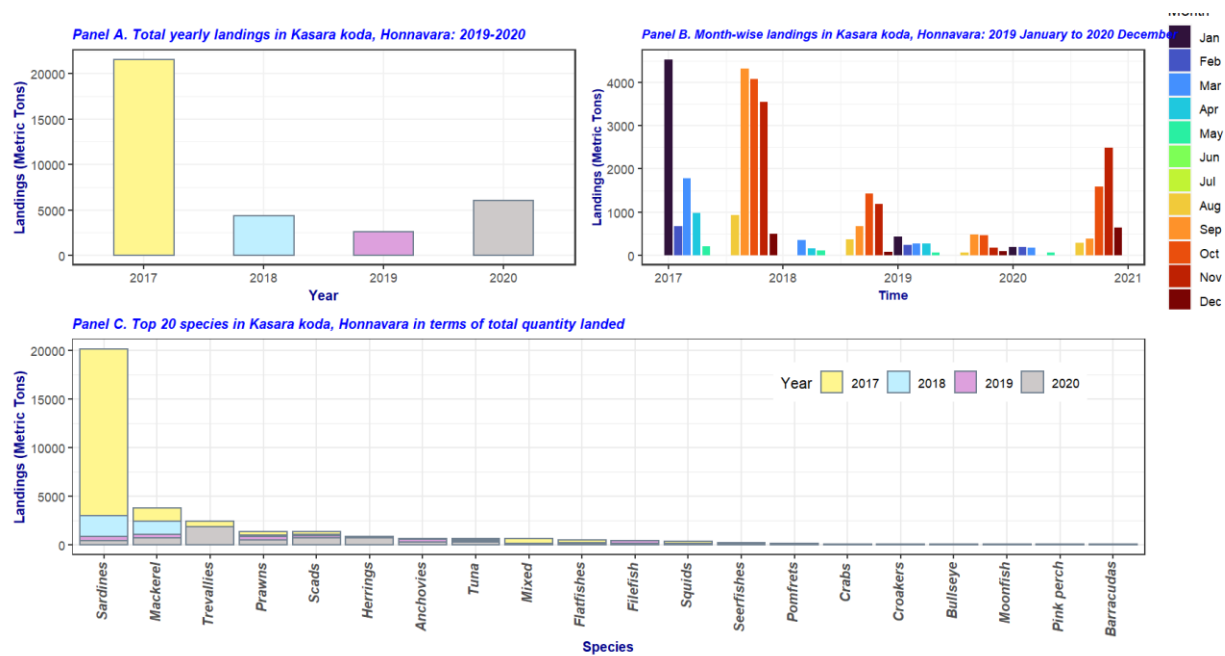


Figure 14. Fish landings at the Kasara koda Harbor: January 2017 to December 2020.

Mavinakurve Harbor

Some salient features of the Mavinakurve Harbor

The Mavinakurve Harbor is situated on the banks of Sharabi river in Bhatkala taluk, Uttara Kannada district. The harbor includes a 186m long wharf, an ice plant, a fish auction hall, and diesel bunks. There are 604 fisher families in Mavinakurve, with a total fisher population of 2,743 of whom 708 are active fishers. There are 83 fishing craft in Bhatkala Bunder, all of which are mechanized (64 trawlers and 19 purse-seiners). Figure 15 shows some glimpses of the Mavinakurve harbor.

Description of fish landings at the Mavinakurve Port

1. Panel A of Figure 16 shows the annual total fish landed at Mavinakurve for the years 2019 and 2020. Compared to neighboring harbors in Amadalli and Belekeri, substantially more fish have been landed in 2019 in Mavinakurve.
2. However, as shown in Panel B of Figure 16, there was no fish landed in most of the months in 2019. Even in 2020, there are zero landings during April, June and July. Peak landings occur during November and December.
3. Panel C of Figure 16 shows the top-20 species/products landed in terms of 2-year cumulative landings at Mavinakurve.
 - a. The redtoothed filefish/triggerfish (*Odonus niger*) is ranked 1st, with substantial catches recorded in 2019.
 - b. As with Amadalli and Belekeri, pelagic species such as tuna, herrings, mackerel, scads, sardines, and trevallies are in top-10.
 - c. Unlike Amadalli and Belekeri, *trash fish* and *mixed varieties* are landed at larger quantities in Mavinakurve.



Figure 15. Some glimpses of the Mavinakurve Harbor.

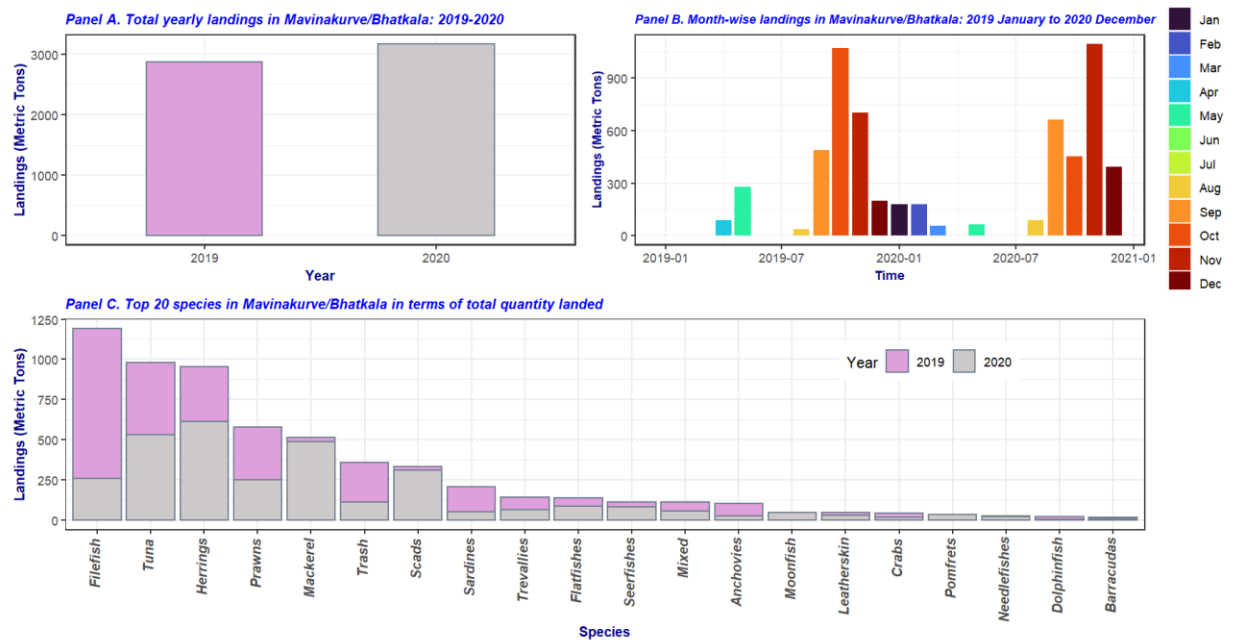


Figure 16. Fish landings at the Mavinakurve Harbor: January 2019 to December 2020.

Gangolli Fishing Harbor

Salient features of the Gangolli fishing harbor

The Gangolli Fishing Harbor is situated in Kundapura taluk of Udupi district. Modernization of the Gangolli Fishing Harbor was completed in 2007 with the construction of a 403m long wharf, two auction halls, a shed for storing and mending of gears. The Gangolli fishing village has 969 fisher households with a total fisher population of 4,828, of whom 1,439 are active fishers. There are 506 fishing craft in Gangolli Fishing Harbor, of which 197 are mechanized craft (177 trawlers and 20 purse-seiners), 294 are motorized (all with outboard engines), and 15 are non-motorized craft. Figure 17 shows some snapshots of the Gangolli Fishing Harbor.

Description of fish landings at the Gangolli fishing harbor

1. Panel A of Figure 18 shows the annual total fish landings at Gangolli from January 2017 to December 2020. Highest landings were recorded in 2017 and from then on landings have decreased over the years.
2. Monthly landings plotted in Panel B of Figure 18 show abnormally high landings during December 2017, which probably led to spike in the annual total production in 2017. Peak landings occur during cooler months of November to January while summers have low landings. No landings take place during the monsoon months in Gangolli Fishing Harbor.
3. Panel C of Figure 18 shows top-20 species landed at Gangolli Fishing Harbor in terms of 4-year cumulative landings.
 - a. Sardines rank 1st and show particularly large quantities of landings in 2017. The unusual spike in monthly landings seen in Panel B of Figure 18 in December 2017 is most probably due to plentiful landings of sardines.
 - b. Mackerel comes a close second to Sardines in terms of total 4-year landings, and shows lesser variations in year-wise landings than Sardines.
 - c. Several pelagic species appear in the top-20 list (Sardines, mackerel, scads, tuna, trevallies, anchovies etc.).
 - d. There are some demersal species in the top-20 list such as flatfishes, crabs, squids, pink perch, croakers, and ribbonfishes.
 - e. Trash fish are in top-5.

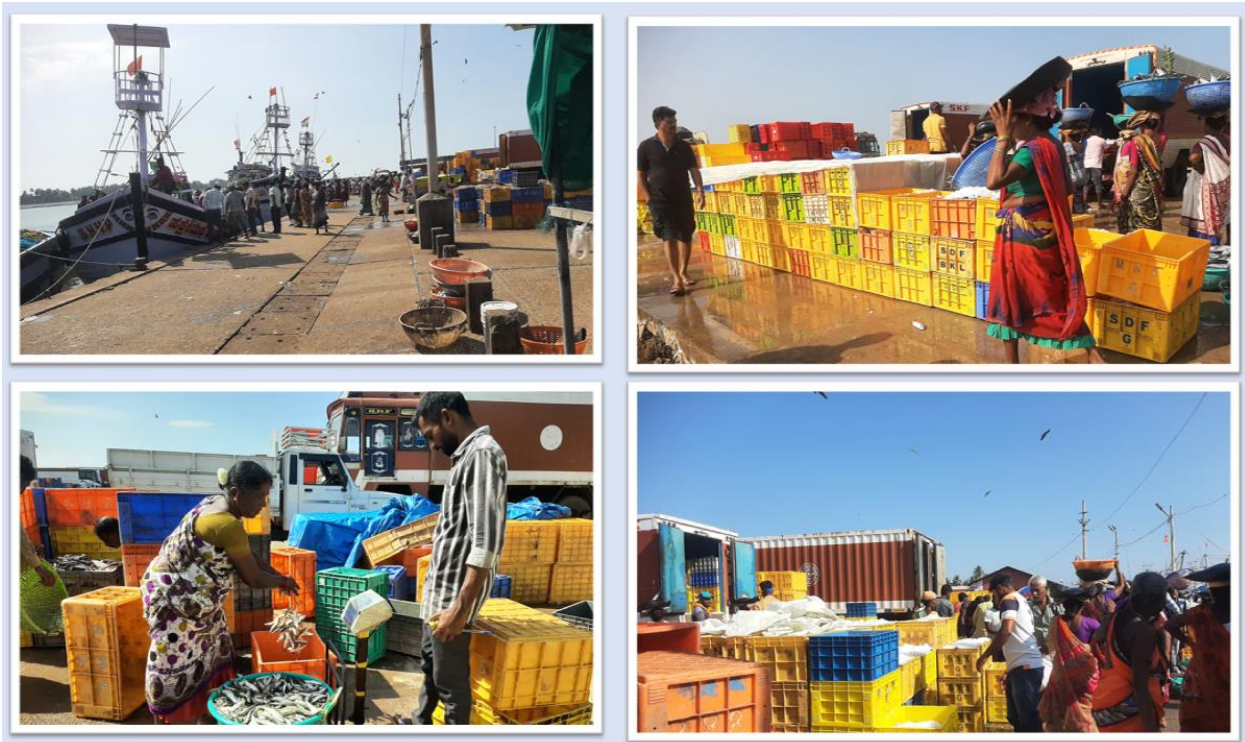


Figure 17. Some glimpses of the Gangolli Fishing Harbor.

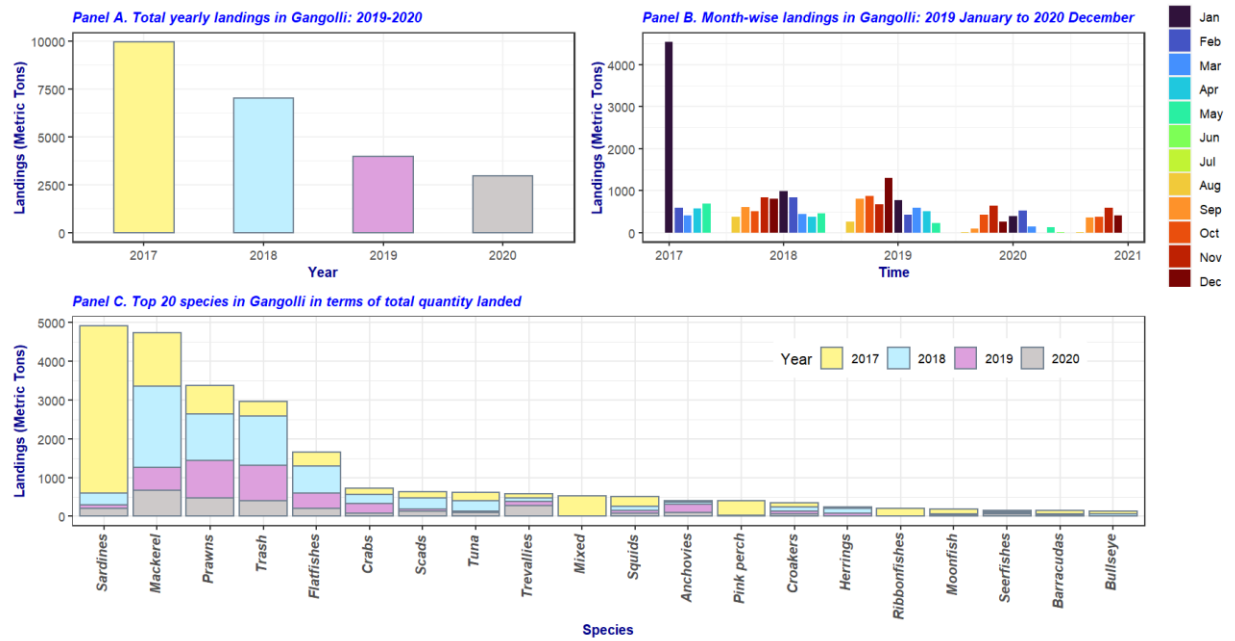


Figure 18. Fish landings at the Gangolli Fishing Harbor: January 2017 to December 2020.

Malpe Fishing Harbor

Some salient features of the Malpe Fishing Harbor

The Malpe Fishing Harbor is situated on the banks of the Udyavara river in Udupi taluk and district. Modernization of the Malpe Fishing Harbor was completed in 1985-86 with 160m long wharf and other facilities including a fish auction hall. Since then, the harbor has been upgraded periodically. At present the harbor has a 540m long wharf with three 140m long T-Head jetties. There are two fish auction halls of 1,500 square meters area each. The harbor area has about 45 ice plants with a production capacity of 950 tons, eight cold storage units with total capacity of 1095 tons, four freezing plants with 23 tons capacity, and four freezing plants with 725 tons capacity. The Malpe fishing village has 241 fisher families with a total fisher population of 1,293. Fishing and allied activities provide employment to 459 people, of whom 166 are active fishers. There are 2067 fishing craft in the Malpe Fishing Harbor, of which 1633 are mechanized (1,521 trawlers and 112 purse-seiners), 424 motorized craft (all fitted with outboard engines), and 10 non-motorized boats. Figure 19 shows some snapshots of the Malpe Fishing Harbor.

Description of fish landings at the Malpe Fishing Harbor

1. Panel A of Figure 20 shows the annual total landings at the Malpe Fishing Harbor for four years from 2017 to 2020. Highest landings were recorded in 2017, and the lowest in 2020.
2. Panel B of Figure 20 shows monthly landings at the Malpe Fishing Harbor from January 2017 to December 2020. Peak fishing occurs during the cooler months of September to December. Landings during the summer months (March to May) are substantial compared to smaller harbors, but show wide variations across the years.
3. Panel C of Figure 20 shows the top-20 species landed at the Malpe Fishing Harbor in terms of 4-year aggregate landings, and their respective annual breakdowns.
 - a. Pink perch and mackerel occupy the 1st and the 2nd rank, respectively. Squids, Trash fish, and Sardines occupy the next three ranks with very similar 4-year aggregate landings.
 - b. There are many pelagic species in the top-20 list, including mackerel, sardines, scads, trevallies, and anchovies.
 - c. Unlike smaller harbors where pelagic species are more common in the top-10 list, the Malpe Fishing Harbor has several demersal species in the top ranks, including the pink perch, squids, ribbonfishes, lizardfishes, cuttlefishes, prawns,

croakers, and flatfishes. This may be due to the dominance of trawler landings in the harbor.

- d. Trash fish are landed in substantial quantities in Malpe, which again could be due to the dominance of trawler landings.

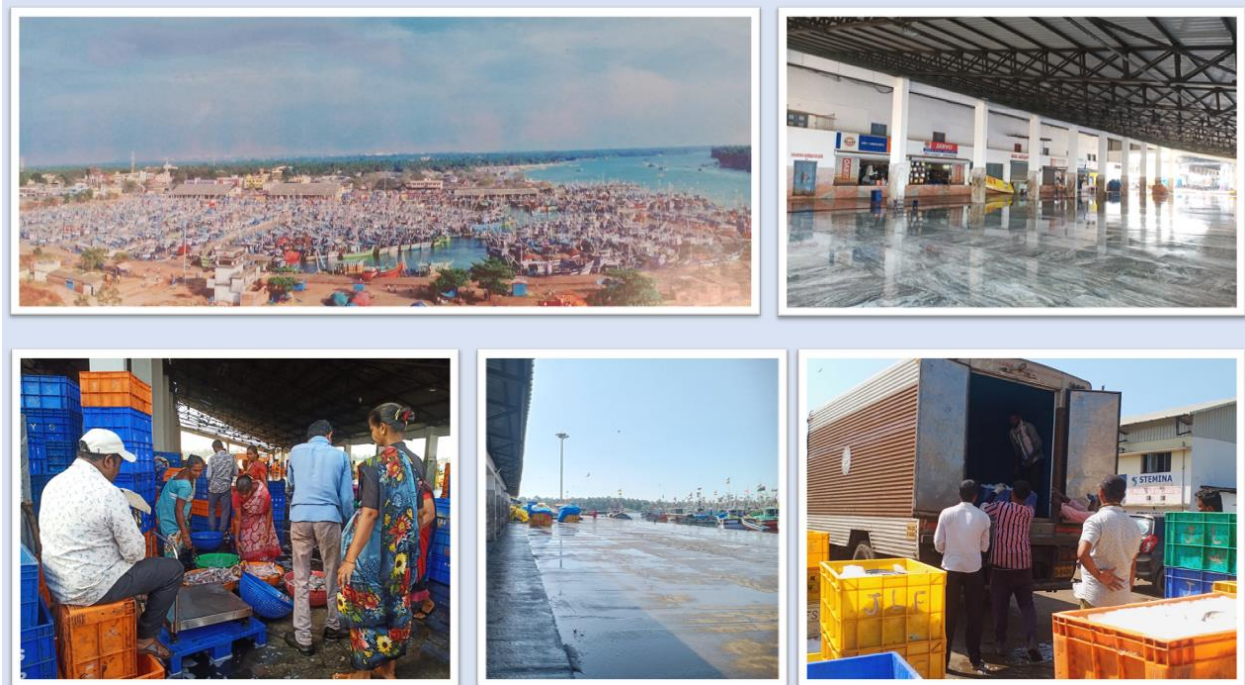


Figure 19. Some glimpses of the Malpe Fishing Harbor.

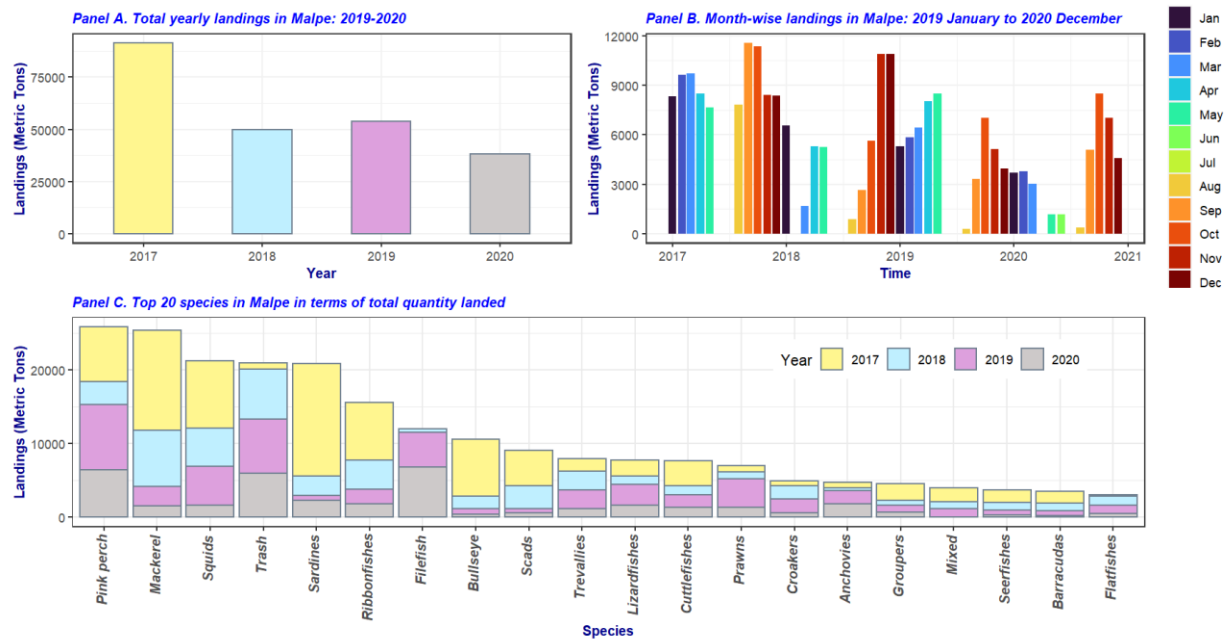


Figure 20. Fish landings at the Malpe Fishing Harbor: January 2017 to December 2020.

Mangaluru Fishing Harbor

Some salient features of the Mangaluru Fishing Harbor

The current Mangaluru Fishing Harbor is situated at the confluence of two rivers, viz the Gurupura river and the Nethravathi river. The Bunder has a 616m long quay, and can berth 438 boats. There are two fish auction halls, a mechanical workshop, five diesel bunks, and four ice plants. However, facilities such as boat-building yard, fish drying yard, and sheds for fishing gear are not available. The Bunder has 1,217 fishing craft of which 891 are mechanized (805 trawlers, 86 purse-seiners), and 326 fitted with outboard motor. Figure 21 shows some snapshots of the Mangaluru Fishing Harbor.

Description of fish landings at the Mangaluru Fishing Harbor

1. Panel A of Figure 22 shows the total annual landings at Mangaluru Fishing Harbor for years 2017 to 2020. Unlike the other harbors, highest landings did not occur in 2017 in Mangaluru, but in 2018. There was a drastic decline in catches in 2020.
2. Panel B of Figure 22 shows the monthly landings from January 2017 to December 2020. No landings are recorded in the monsoon months of June and July due to the fishing ban imposed on boats with engines over 10 horsepower capacity. During the period of 2017-2020, monthly/seasonal catch patterns are fairly uniform, with highest landings occurring in the cooler months of September to December. Lower catches are landed during summer months of March and April (except in 2019). In May, landings are again high probably due to the onset of the southwest monsoons and fishers trying to earn before the fishing ban sets in during June and July. In 2020 there were negligible/no landings in the months of April to August.
3. Panel C of Figure 22 shows the top-20 species landed at the Mangaluru Fishing Harbor in terms of 4-year aggregate landings, and their respective annual breakdowns.
 - a. Over the 4-year period, the red-toothed filefish is the most-landed fish at the Bunder. Despite no records of being caught in 2017, there were substantial catches of the filefish in the remaining years, making it the most-landed species.
 - b. Like the other large fishing harbor Malpe, even Mangaluru has several demersal species in the top-20 most landed list.
 - c. Trash fish form the fifth most landed group.



Figure 21. Some glimpses of the Mangaluru Fishing Harbor

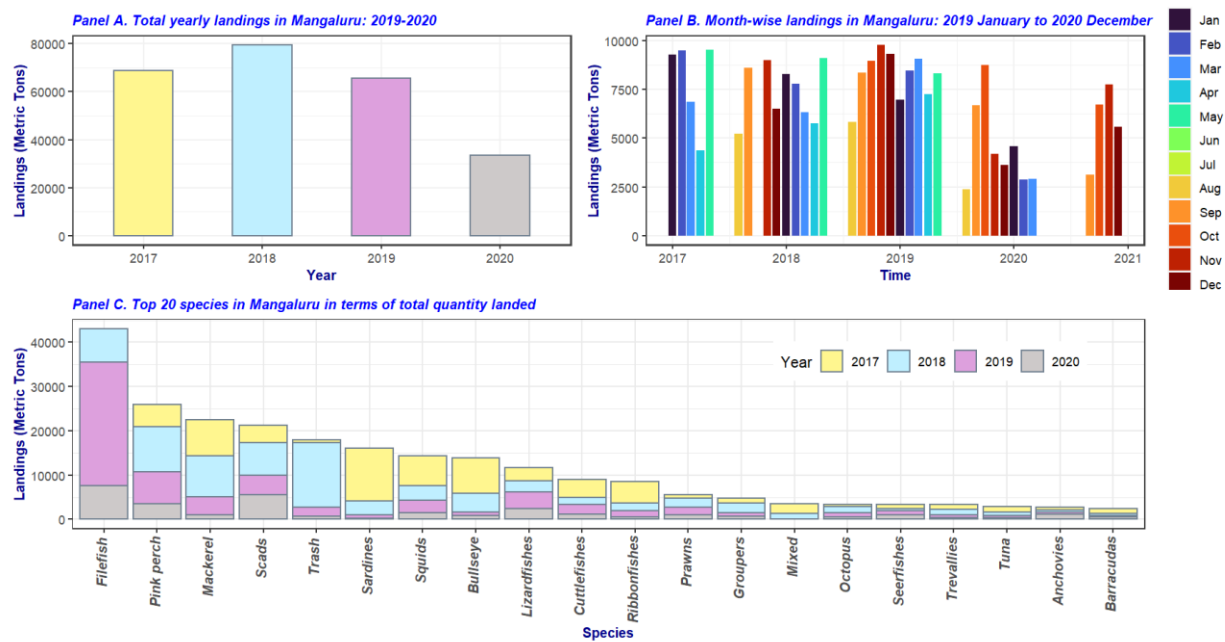


Figure 22. Fish landings at the Mangaluru Fishing Harbor: January 2017 to December 2020

Summary

This report presents the recent patterns in fish landings in the nine major harbors of coastal Karnataka. Among the nine harbors, Malpe and Mangaluru are the largest in terms of quantity of fish landed, accounting for about 70 to 80 percent of total fish landed. Among the fish species, Sardines are the most landed in terms of 4-year cumulative landings, but show large variations in landings across the years.

Going by patterns across harbors, smaller harbors such as Amadalli and Belekeri show more landings of small, coastal, pelagic fish such as anchovies and sardines, than demersal species. In larger harbors, where large mechanized trawlers make a substantial share of fishing craft, demersal species and trash fish are landed in larger quantities.

Harbors need to be maintained in a better shape to facilitate efficient transactions so that quality fish reaches the final consumers at an affordable price. They also need to be provisioned with adequate and enhanced facilities for basic necessities such as potable water, clean freshwater, toilet facilities, and first-aid facilities. While the major harbors at present possess many of the basic facilities such as auction halls and cold storages, actions can be taken to provide improved facilities for more affordable fish processing technologies such as the dry-curing of fish. Moreover, the major harbors at present cater to the docking requirements of larger fishing craft. They do not have facilities to accommodate smaller boats, which cannot dock if the wharf is too high. Adequate facilities for the docking of smaller boats may be provided at the harbors. Minor harbors, also called the beach harbors, can be developed further to facilitate small-scale fishers. Their fish catch profiles need to be tracked scientifically, and their contributions to food security and local economy needs to be analyzed in detail. Such measures would make for an inclusive seafood value chain.