
Status of billfish landings along the coast of Pakistan with special reference to impact of subsurface gillnetting on their catches

Muhammad Farhan Khan
Ministry of Maritime Affairs, Government of Pakistan, Karachi, Pakistan
(farhankhan704@gmail.com) and

Muhammad Moazzam
WWF-Pakistan, Karachi, Pakistan (mmoazzamkhan@gmail.com)

ABSTRACT

Billfish form important part of the landings of tuna and tuna like fishes from Pakistan. Its landings during 2018 was reported to be about 3,521 m. tons which is about 17.93 % less than 2017. The decrease is attributed to a much longer closed season observed by the tuna gillnet fisheries in 2018. Fishing in 2018 was stopped in the late April or beginning of May and initiated only in last week of August i.e. almost no fishing for four months as against normal 2 month ban of June and July.

For the first time, Government of Pakistan was provided species-wise data of billfishes to IOTC which indicated that out of six species of billfishes Indo-Pacific sailfish (*Istiophorus platypterus*) contributed about 2,154 m. tons, black marlin (*Istiompax indica*) 943 m. tons, striped marlin (*Kajikia audax*) 328 m. tons whereas Indo-Pacific blue marlin (*Makaira mazara*) contributed only 96 m. tons. Contribution of shortbill spearfish (*Tetrapturus angustirostris*) and swordfish (*Xiphias gladius*) was insignificant. Billfishes were found in commercial quantities throughout the year, however, period between September through January is the peak season of their catches. Billfishes are not locally consumed but transported to neighboring country through land or sea route.

The study further revealed that due to introduction of subsurface gillnetting the catches of billfishes is substantially reduced. Billfishes are known to inhabit surface water and when gillnet is placed 2 meters below the surface, the catches of billfish are reduced. It was observed that on average about 37 % reduction in catches of billfish is observed in subsurface gillnetting, however, because of increase of catches of yellowfin, longtail and skipjack tunas in subsurface gillnet the loss due to reduction in billfish catches is compensated.

INTRODUCTION

Pelagic gillnetting is an important component of the coastal and offshore fisheries of Pakistan, as about 700 fishing vessels are engaged in harvesting of tuna and tuna like fishes. Historically pelagic gillnetting is one of the oldest fisheries of the area. Gillnets consisting of multifilament nylon nets are used for catching tunas and other pelagic species which include billfishes. Information about tuna gillnet fisheries of Pakistan is

known through the work of Moazzam (2011, 2012, 2014, 2018), Moazzam and Ayub (2015), Moazzam and Nawaz (2014), Moazzam, *et al.* (2016), and Nawaz and Moazzam (2014).

Six species of billfishes belonging to six genera and two families are reported from Pakistan. Of these, one species i.e. swordfish (*Xiphias gladius*) belongs to family Xiphidae whereas all other species belonged to family Istiophoridae. These species form an important part of the landings of tuna gillnet vessels operating in coastal and offshore waters.

Limited information about the billfish landings of Pakistan is available. Some scanty information is available through the work of Moazzam (2011), Moazzam and Usmani ((2004), Osmany *et al.*, (2009) and Rashid (1966). Moazzam (2013), however, provided some details of billfish fisheries of Pakistan including species composition, gears, fishing boats, area of fishing and other aspects of the fisheries. A major part of the information presented by Moazzam (2013, 2018) was based mainly on the fisheries statistical data being published by Marine Fisheries Department. These data, however, do not provide information about species composition of billfishes.

MATERIALS AND METHODS

The information presented in the present study is based on the interaction with fishermen that are engaged in gillnet fishing for tuna and tuna like species in coastal and offshore waters of Pakistan. WWF-Pakistan crew based programme is the major source of the data presented in this paper (Moazzam, 2019). In order to determine the impact of subsurface gillnetting on catches of billfish, the data of bill catches for 2013 was compared with data for the year 2017. Data for 2014 was not used in the study because conversion of fishing fleet to subsurface gillnet was started in December 2014, therefore data for 2014 was not appropriate for analysis. The data for 2017 was used in the analysis presented in this study because by 2017 the fleet is fully adjusted to subsurface gillnetting. In 2013, crew based observers were placed on only 4 tuna gillnet vessels, therefore, average data of the four vessels was used in this study. Although observers were posted on 85 tuna gillnet vessels during 2017, but average of only 30 vessels were analyzed for present study.

RESULTS AND DISCUSSIONS

Billfish Landings

Government of Pakistan publishes a Handbook of Fisheries Statistics of Pakistan (Anonymous, 2013-updated) which contains landing data of commercially important fish species including billfishes (Fig. 1). No information about species composition of billfishes is available in these publications and data of all species of billfish is pooled. Based on the information generated through this WWF-Pakistan's Crew-based Observer Programme, landing data tuna and tuna like species (including billfishes) was calculated which indicated serious anomalies and in most cases data was found to be under-reported. Considering this lacunae, the data collected through WWF-Pakistan's crew based observer programme was reconciled with the landings data available with

Marine Fisheries Department, Government of Pakistan which is regularly being communicated to IOTC since 2017. An exercise for reconstruction of landing data for IOTC species since 1987 to 2017 was also carried out. These data sets were already provided to IOTC by Marine Fisheries Department, Government of Pakistan. The reconciled data for billfishes from 1987 to 2018 is presented in Fig. 2.

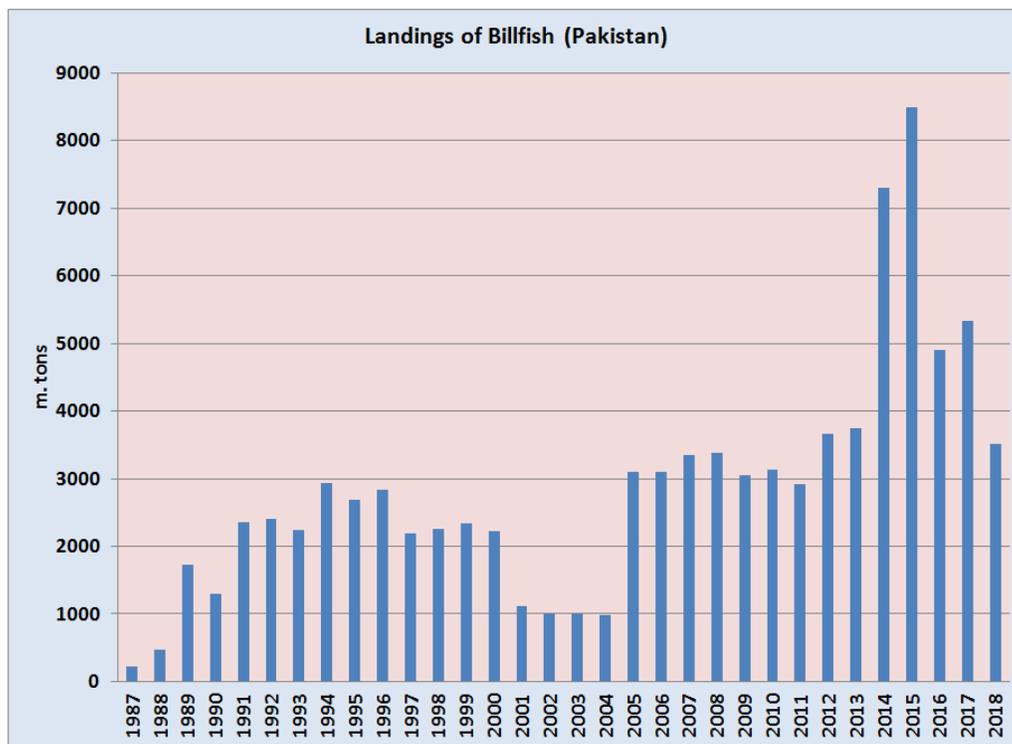


Fig. 1. Billfish landings according to Government Statistics (Anonymous, 2013; updated)

Species Composition

Government of Pakistan used to providing data to IOTC in which data of all billfishes were pooled, however, the data of 2018 communicated to IOTC based on reconciled data generated through WWF-Pakistan's Observer Programme included species composition of billfishes for the first time (Fig. 3). The data indicates that Indo-Pacific sailfish (*Istiophorus platypterus*) is the dominating species in the landings contributing about 61 % of the landings of billfish which is followed by black marlin (*Istiompax indica*) contributing about 21 % of the total billfish landings. Striped marlin (*Kajikia audax*) contribution was about 9 % whereas blue marlin (*Makaira mazara*) contributed only 3 %. Contribution of shortbill spearfish (*Tetrapturus angustirostris*) and swordfish (*Xiphias gladius*) was insignificant, therefore, not represented graphically.

Subsurface Gillnetting

With the introduction of subsurface gillnetting, it was noticed that the catches of all major group of ETP species including cetaceans, sea turtles and sharks are noticeably reduced. Placing gillnet below 2 m proved to a success, as catches of target species of

gillnet fisheries including yellowfin, longtail and skipjack tunas increased substantially (Moazzam and Khan, 2019), however, catches billfish were observed to be substantially decreased. High catches of target species i.e. yellowfin, longtail and skipjack tunas compensates for the losses incurred due to decreased catches of billfish.

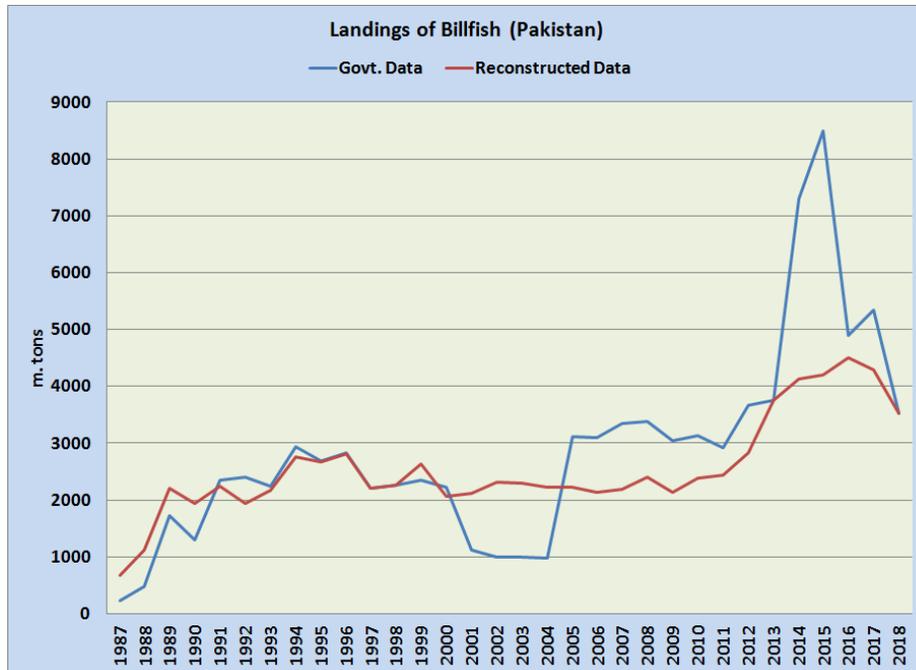


Fig. 1. Landings of billfish along Pakistan coast (Government data and Reconstruction data)

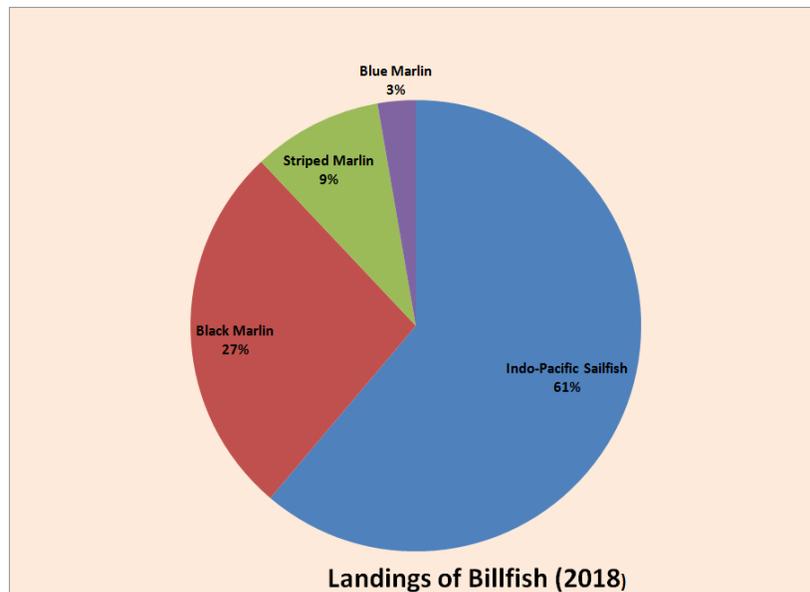


Fig. 3. Billfish landings for year 2018 (Species)

Present study revealed that there average CPUE (kg per month) of billfish decreases from 6,107 kg/month in 2013 to only 3,337 kg/month in 2017, therefore, a reduction 54.64 % was noticed in the catches of billfish in subsurface gillnet as compared to catches of surface gillnets. Month-wise changes in the CPUE billfish is given in Fig. 4 which reveals that the catches of billfish were higher in surface gillnets during February, March, April, May and December whereas the catches of billfish were higher in subsurface gillnets during September and November. No catches of billfish were recorded in surface gear in January and October and no billfish catches were recorded in subsurface gear in September. Tuna gillnet operations are stopped during June to August, due to voluntary close season, therefore, no data for these three months is available.

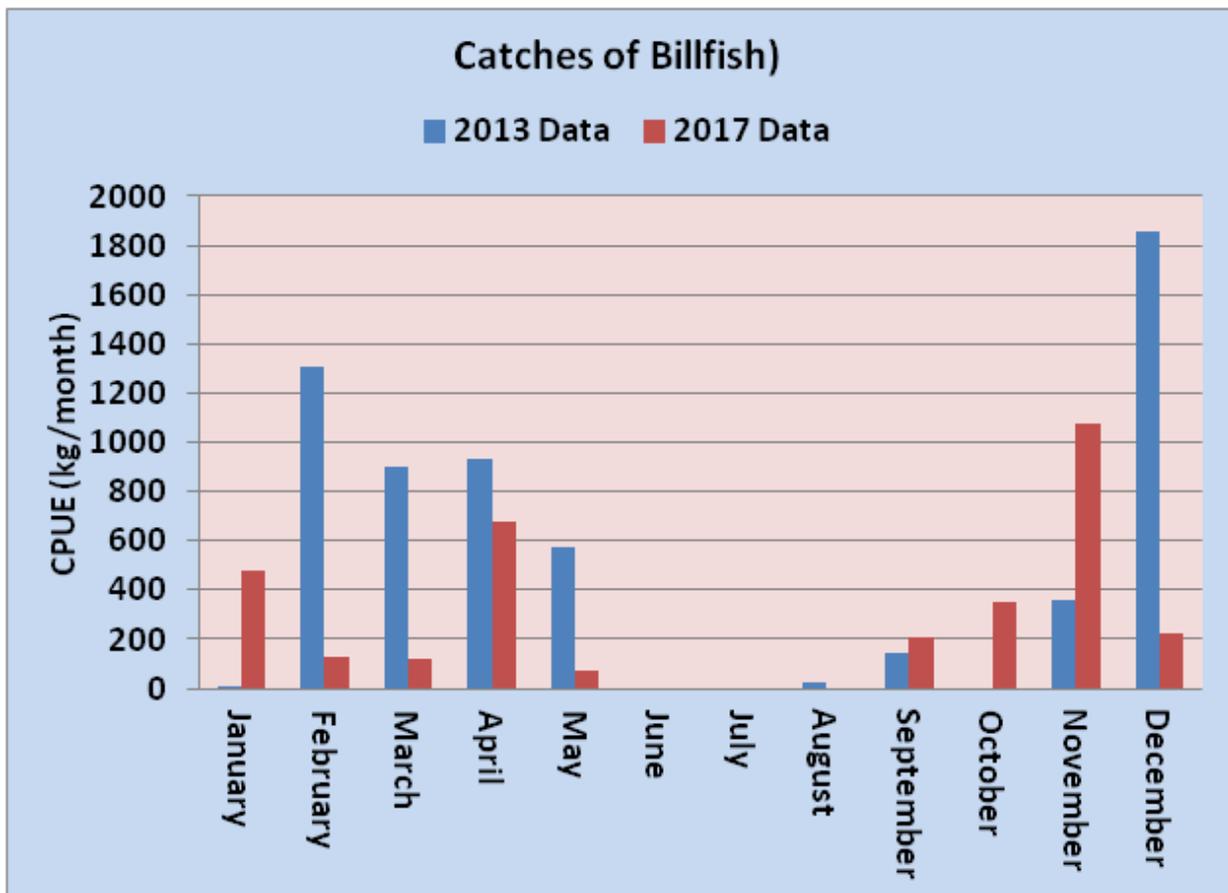


Fig. 4. Catch Per Unit Effort of Billfish in 2013 and 2017

CONCLUSION

Adoption of subsurface gillnet operation by Pakistani fishermen since 2014 has shown promising results as far as catches of ETP species such as dolphins and sea turtles is concerned which were observed to be much lower in subsurface gillnet than in surface

operations. Billfish on the other hand whose catches were substantially dropped in subsurface gillnet. It was observed that overall billfish catches were 54.64 % lower in the subsurface gillnet operation as compared to surface placement of gillnets. A marked seasonality was observed in case of billfish catches with peak in surface gear in December (2013) and in subsurface gear in November (2017). Billfishes are among the species of large pelagic that fetch very high prices in the target market in neighbouring country, therefore, according to fishermen it is one of the major loss while using subsurface gear. However, increase of catches of yellowfin, longtail and skipjack tunas in subsurface gillnet which also fetches equally good prices in target market, the loss due to reduction in billfish catches is well compensated. In addition, hassle free operation of subsurface gillnet is another attraction for popularity of its use by Pakistani gillnet fleet (Moazzam and Khan, 2019). A detailed analysis of the catches of various billfish species is underway with the aim to study the impact of subsurface gillnet operations on individual billfish species on seasonal basis and depending on areas of operation.

REFERENCES

- Anonymous, (2013). Handbook of Fisheries Statistics of Pakistan. Vol 23. Marine Fisheries Department, Government of Pakistan, Karachi
- Moazzam, M., (2011). Tuna situation analysis. WWF-Pakistan Publication, Karachi.
- Moazzam, M., (2012). Status report on bycatch of tuna gillnet operations in Pakistan. WPEB08, South Africa, September 7 – 19, 2012. .IOTC–2012–WPEB08–13. 12p.
- Moazzam, M. (2013). Billfish: An important part of the pelagic gillnet fisheries of Pakistan. Eleventh Session of IOTC Working Party on Billfish (WPB11) 18-22 September 2013. La Reunion, France. IOTC-2013-WPB11-11
- Moazzam, M., (2018). Status of billfish fisheries of Pakistan. Working Party on Billfish WPB16. Cape Town, South Africa, September 4-8, 2019. IOTC-2018-WPB16-27. 7p.
- Moazzam, M., (2019). Crew based observer programme of WWF-Pakistan-A source of data collection on cetacean bycatch. IWC Scientific Committee Meeting- The Subcommittee on (Unintentional) Human Induced Mortality (HIM). SC/68A/HIM/12-International Whaling Commission 15p.
- Moazzam, M. and Ayub, S., (2015). Changes in the landings of neritic tuna and tuna like species in Pakistan during last three years. Working Party on Neritic Tuna (WPNT05). Zanzibar, Tanzania, May 26-29, 2015. IOTC–2015–WPNT05–25. 7p.

- Moazzam, M., Khan, M. F., (2019). Issues related to adoption of subsurface gillnetting to reduce bycatch in Pakistan. IOTC Working Party on Ecosystem and Bycatch. La Reunion, France September 3-7, 2019. IOTC-2019-WPEB15-48. 13p.
- Moazzam, M., Khan, M. W. and Nawaz, R. (2016). Bycatch of commercially important species of the tuna gillnet fisheries of Pakistan. IOTC–2016–WPEB12-40. 1-16.
- Moazzam, M. and Nawaz, R. (2014). By-catch of tuna gillnets fisheries of Pakistan: A serious threat to non-target endangered and threatened species. Mar. Biol. Ass. India, 56: 85- 90,
- Moazzam, M., and Usmani, H. B., (2004). Billfishing grounds of Pakistan. Sportfishing Pakistan, Karachi
- Osmany, H. M., Moazzam, M. and Zohra, K., (2009). Distribution and abundance of billfishes along the coast of Pakistan. 29th Pakis Congr. Zool. FEWFM-30: 134-135 (Abstract).
- Rashid, M. H. (1966). Fishes belonging to the families Scomberidae, Scomberomoridae and Histiophoridae identified from the West coast of Pakistan. Agric. Pak. 17:447-452.