

# Status of tropical tuna fisheries of Pakistan especially impact of subsurface gillnetting on their landings

Muhammad Moazzam, Saba Ayub, Umair Shahid, Rab Nawaz and Babar Khan

WWF-Pakistan, 46-K, PECHS Block 6, Karachi-75400, Pakistan  
([mmoazzamkhan@gmail.com](mailto:mmoazzamkhan@gmail.com))

## ABSTRACT

Tropical tuna is represented by two species in Pakistan; of these yellowfin tuna (*Thunnus abacares*) contributed 16,541 m. tons during 2018. Annual landings of skipjack tuna (*Katsuwonus pelamis*) during 2018 were recorded to be 2,318 m. tons. The landings of tropical tuna in 2018 was 46.89 % lower than 2017 which is mainly because of operation of tuna fleet in coastal waters as compared to previous years when the fleet was operating in comparatively deeper and offshore deeper waters. This is because of lower prices of tropical tunas in the neighboring country owing to unprecedented decrease in currency value. In addition, fishermen kept their operation closed during mid May to mid August as compared to normal close season during June and July. The study further revealed that CPUE of tropical tuna was about 48.81 % higher in subsurface gillnet (2018 data) as compared to surface gear (2013 data).

## INTRODUCTION

Gillnetting for tropical tuna is an important fisheries of Pakistan as a major part of the fleet is engaged in this fishing. Gillnets consisting of multifilament are used for catching tropical tunas including yellowfin tuna (*Thunnus abacares*) and skipjack tuna (*Katsuwonus pelamis*). Bigeye tuna (*Thunnus obesus*) is rarely caught by the gillnet fishing vessels in coastal and offshore waters, therefore, it does not contribute to the tuna landings of Pakistan.

Information about tropical tuna fisheries of Pakistan is known through the work of Khan (2016), Moazzam (2011, 2012a-b, 2014, 2018), Moazzam *et al.*, (2017) and Nawaz and Moazzam (2014). These studies were based mainly on the fisheries statistical data that was published by Marine Fisheries Department, Government of Pakistan. Some information collected through the Crew-based Observer Programme initiated by WWF-Pakistan since 2012 is also incorporated in this study.

Based on the information generated through this WWF-Pakistan's Crew-based Observer Programme, data of tuna and tuna like species was reconciled with the landings data available with Marine Fisheries Department, Government of Pakistan. An

exercise for reconstruction of landing data for IOTC species since 1987 to 2018 was also carried out. These data sets were provided to IOTC by Marine Fisheries Department, Government of Pakistan whereas a part of it was presented in WPNT07 (Moazzam and Ayub, 2017).

## TROPICAL TUNA LANDINGS

Tropical tuna landings during 2018 was observed to be comparatively much lower than previous years (Table-I). Total landings of tropical tuna was observed to be 20,876 m. tons during 2018 whereas it was 30,665 m. tons. The landings of tropical tuna, therefore was 46.89 % lower than 2017 as compared to landings of 2018. Landing of yellowfin tuna (*Thunnus albacares*) was 16,541 m. tons during 2018 as compared to 2017 landings which was 25,471 m. tons. Annual landings of skipjack tuna (*Katsuwonus pelamis*) during 2018 were recorded to be 2,318 m. tons which was 3,178 m. tons during 2017.

The major decrease in landings of tropical tuna during 2018 is attributed to operation of Pakistani tuna fleet in coastal waters during major part of the year as compared to previous years when the fleet was operating in comparatively deeper and offshore deeper waters. Fishermen targeted tuna like species including Spanish mackerel (*Scomberomorus spp.*), dolphinfish (*Coryphaena hippurus*) and queenfish (*Scomberoides commersonianus*) which fetch higher prices. It is worth mentioning that longtail, yellowfin and skipjack tunas are traded with neighboring country whereas kawakawa and frigate tuna are mainly exported to Sri Lanka in salted-dried form whereas small quantities of these species are locally consumed.

Major decrease in tropical tuna during 2018 is mainly because of lower prices of tropical tunas in the neighboring country because of unprecedented decrease in currency value. In addition, fishermen kept their operation closed during mid May to mid August as compared to normal close season during June and July

Table-I: Landings of Tropical Tuna Landings during 2017 and 2018

Species	Scientific Names	2017	2018	% Increase/Decrease
Yellowfin tuna	<i>Thunnus albacores</i>	25,471	16,541	53.98
Skipjack Tuna	<i>Katsuwonus pelamis</i>	3,178	2,318	37.10
Bigeye tuna	<i>Thunnus obesus</i>	0	0	-
<b>TOTAL</b>		<b>30,665</b>	<b>20,876</b>	<b>46.89</b>

Source: Marine Fisheries Department, Government of Pakistan

## TREND OF TROPICAL TUNA LANDINGS

Tropical tuna has always been very important component of large pelagic fisheries in Pakistan. Landings data reconstructed by Marine Fisheries Department, Government of Pakistan and WWF-Pakistan (Moazzam *et al.*, 2017) indicates that annual landings of tropical tuna ranged between 6,000 m. tons during 1987 to a maxima of about 29,000 in 2017 (Fig.1). Unprecedented increase in the annual landings of tropical tuna was noticed in 2017, thereafter the landings to tropical tunas plunged down to a level of about 16,500 m. tons in 2018.

Analysis of the reconstructed landing data also indicates that yellowfin tuna (*Thunnus albacares*) is the most dominating species among all neritic and tropical tunas species. An increasing trend in the annual landings is noticeable since 2000 when landings of yellowfin tuna were 8,000 m. tons which steady increasing till 2017, thereafter it decreased to a level of 16,541 m. tons. Minor decrease was also noticed in 2009 and 2013 (Fig. 2).

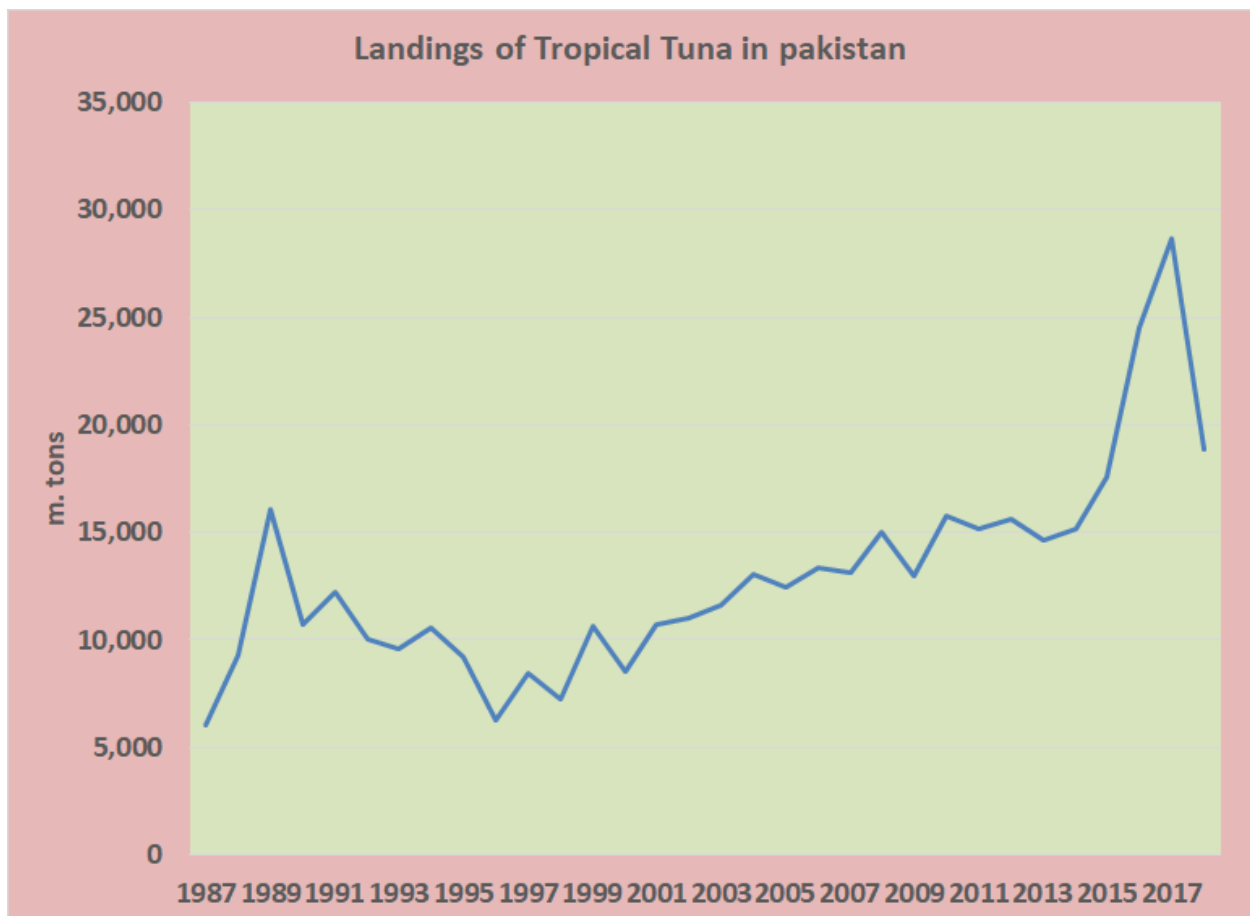


Fig. 1: Trend of landings of tropical tuna in Pakistan.

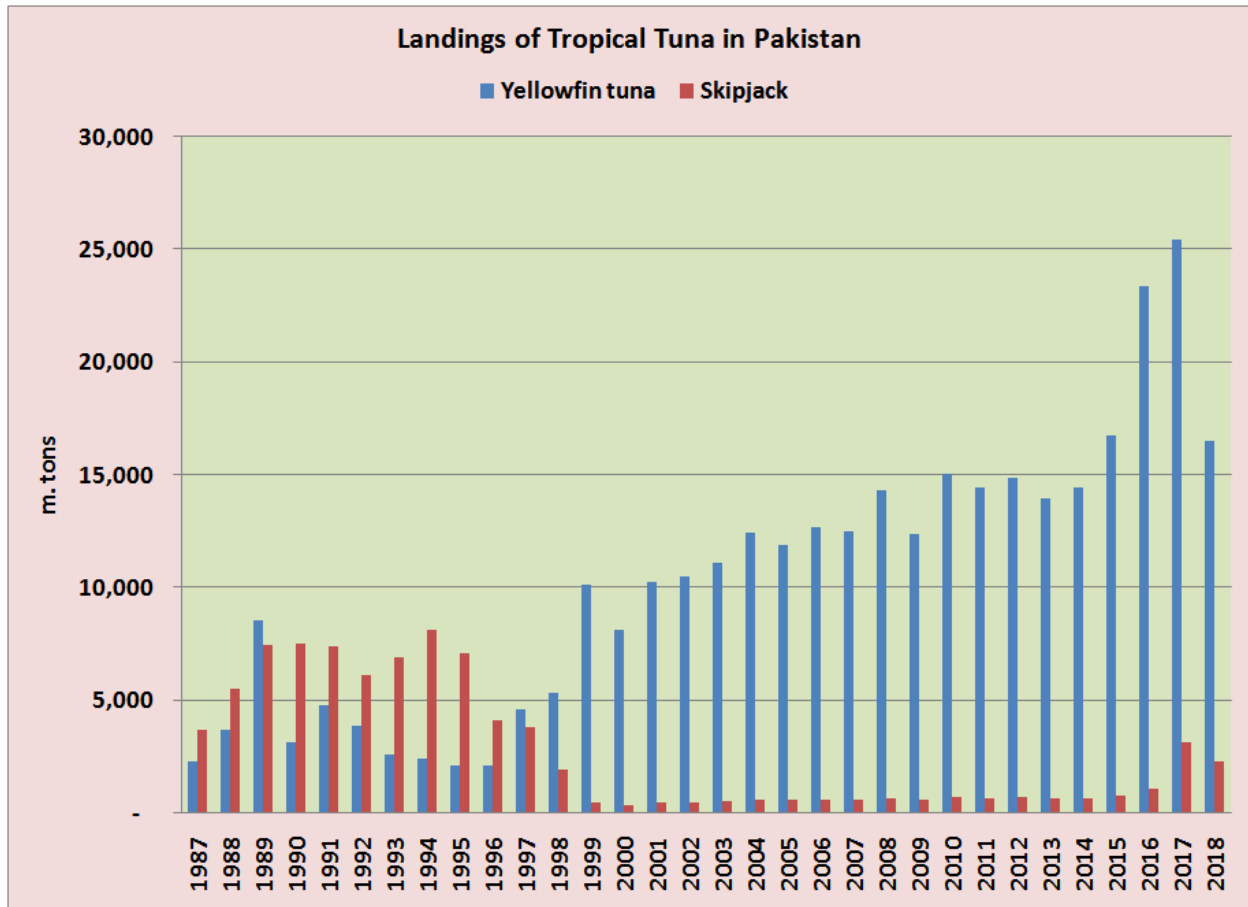


Fig.2: Trend of landings of tropical tuna species in Pakistan

An opposite trend was observed in case of skipjack tuna (*Katsuwonus pelamis*). Its annual landings were observed to have maxima in 1994 when it reached to a level of 8,000 m. tons. Since then its annual landings decreased to 485 m. tons in 1999. This decrease can be attributed to impact of Somali piracy (Moazzam 2012). Annual landings of skipjack tuna remained low (between 485 m. tons and 1,118 m. tons) during 1994 and 2016. An unprecedented increase in annual landings of skipjack tuna was noticed in 2017 when it reached a level of 3,000 m. tons. In 2018, the landings of skipjack tuna again decreased to a level of 2,318 m. tons owing to decreasing prices in the intended market.

### SEASONAL CATCHES OF TROPICAL TUNA

Data collected through WWF-Pakistan's Crew-based Observer Programme revealed a marked seasonality in the CPUE of tropical tuna. Peak CPUE of tropical tuna was observed in January, September and October (Fig. 3). In contrast the peaks of CPUE were observed during March and April during average of five year data from 2013 to 2017 (Moazzam, 2018). Minimum CPUE was observed during May in average

data for 2013 to 2017 and also during 2018 which is mainly because the tuna gillnet vessels start closing down their operations by mid of May in anticipation for voluntary close season during June and July.

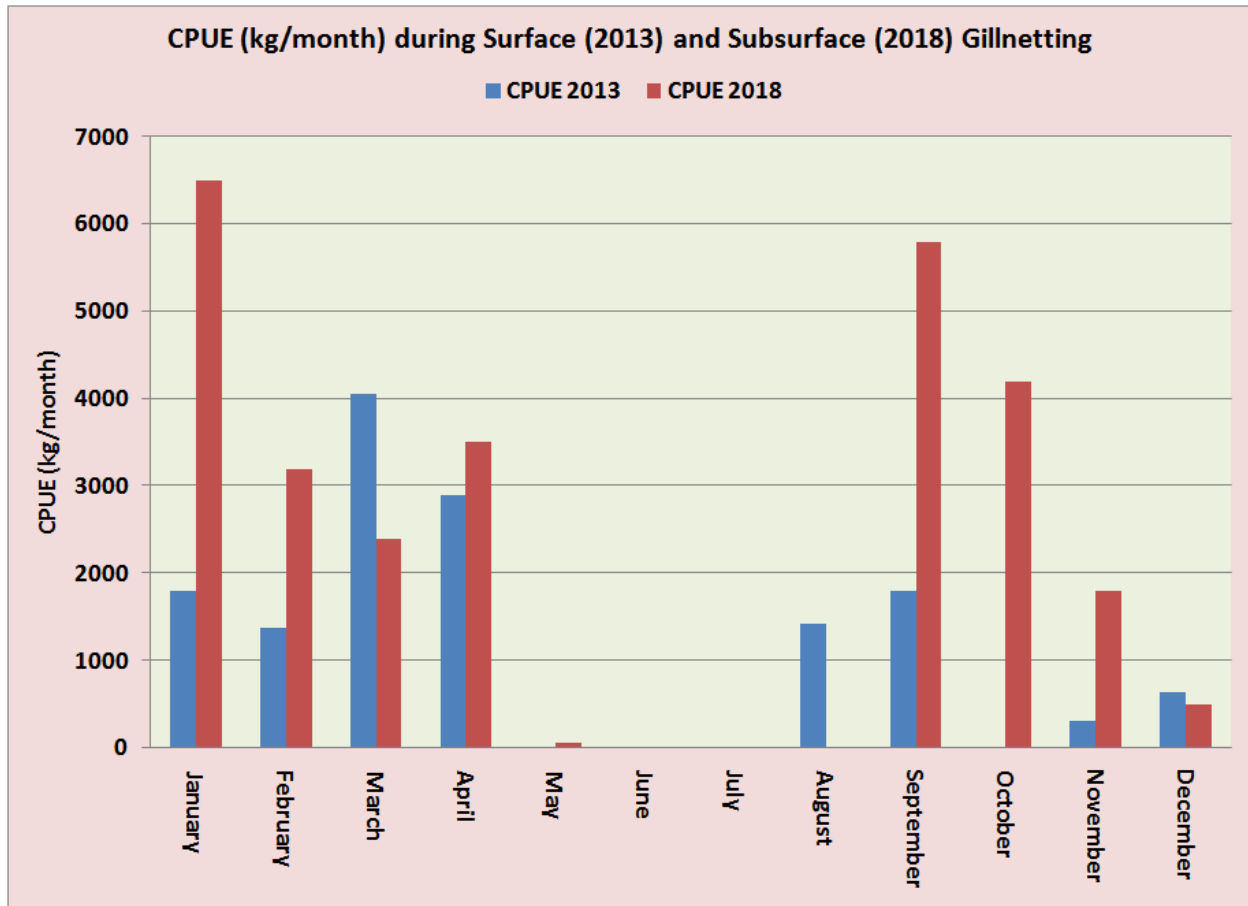
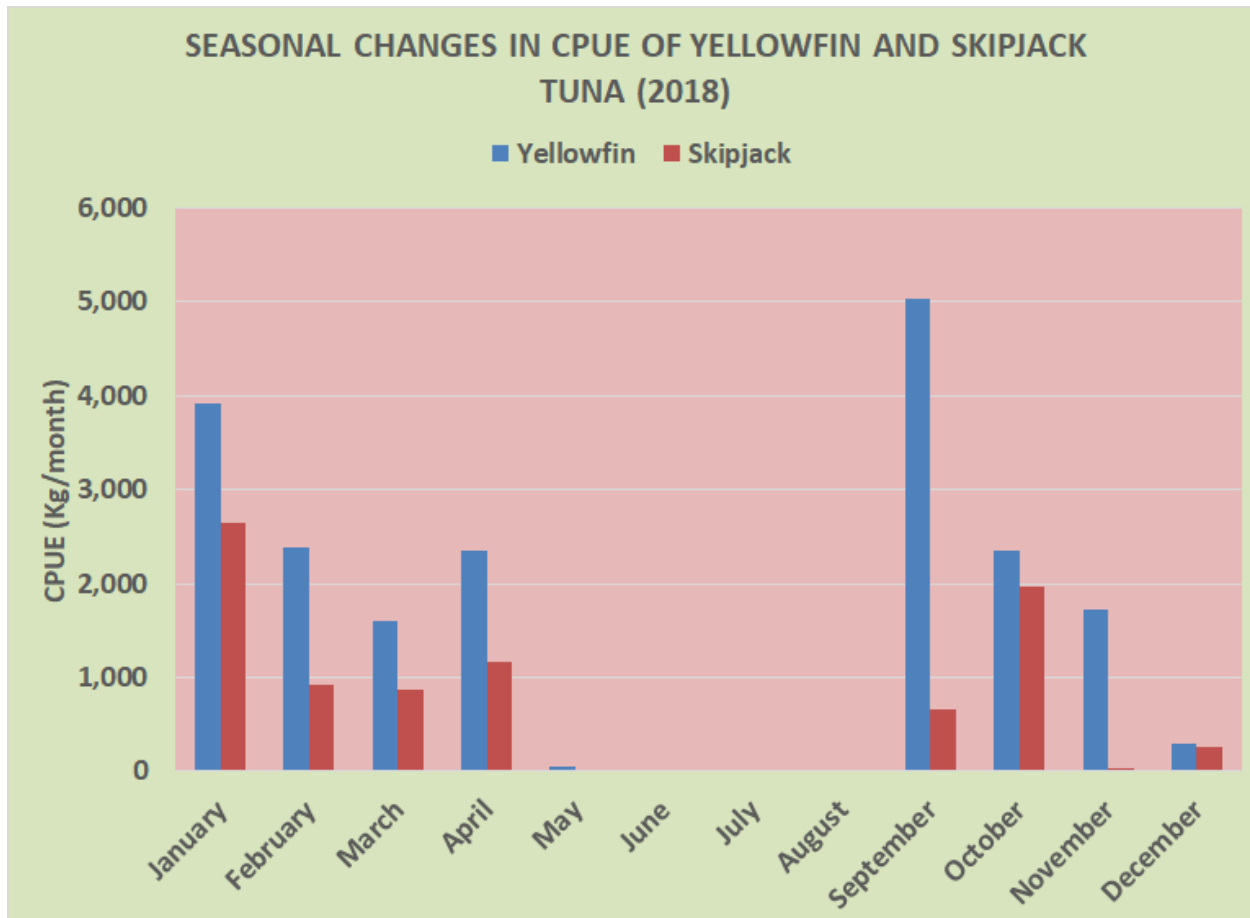


Fig. 3: Seasonal changes in CPUE (kg/month/boat) of tropical tuna in Pakistan (2013 and 2018).

The analysis further revealed that CPUE of yellowfin tuna was higher throughout the year (Fig. 4). The CPE of skipjack tuna were observed to be extremely low during November. It is worth mentioning that average data for 2013 to 2017 indicates high CPUE of skipjack during November and December when major part of the fleet moves to offshore and deeper waters of EEZ of Pakistan and in the Area Beyond National Jurisdiction (ABNJ) where skipjack are more common as compared to yellowfin tuna. However during 2018, almost entire fleet operated in coastal waters because of low prices for tropical tuna in the neighboring country. Fishermen during this period targeted tuna like species including Spanish mackerel (*Scomberomorus spp.*), dolphinfish (*Coryphaena hippurus*) and queenfish (*Scomberoides commersonianus*) which fetch higher prices.



. Fig. 4: Seasonal changes in catches of Tropical tuna species in Pakistan (averaged for 2013-2017).

### IMPACT OF SUBSURFACE GILLNETTING

In order to reduce bycatch of endangered, threatened and protected (ETP) species including cetaceans, turtles, whale sharks, mobulids and sunfish, WWF-Pakistan introduced subsurface gillnetting in 2014 which is fully adopted by 2016 (Moazzam and Khan, 2019). It was noticed that in the subsurface gillnets, the catches of all major group of ETP species including cetaceans, sea turtles, billfishes and sharks are noticeably reduced (Khan and Moazzam, 2019; Moazzam and Khan, 2019; Shahid *et al.*, 2018). On average there was 15.06 % decrease in the catches of sharks in subsurface gillnet as compared to catches of surface gillnets (Shahid *et al.*, 2018). Khan and Moazzam (2019) reported a decrease of 54.64 % was noticed in the catches of billfish in subsurface gillnet as compared to catches of surface gillnets.

Catches of tropical tunas are found to be much higher in subsurface gillnetting as compared to surface gillnetting. Present study reveals that on average an increase of 48.81 % in catches of tropical tunas was noticed in 2018 as compared to 2013 data

(Fig. 3). Month-wise changes in the catches of tropical tuna is also given in Fig. 3 which reveals that the catches of tropical tunas were higher in surface gillnets only during, March and December whereas in the remaining period catches of tropical tuna was much higher during rest of the year. There was no catch of tropical tunas in the month August 2013 in subsurface gears whereas no tropical tuna was caught in surface gears in October 2013 (also during May 2013). Tuna gillnet operations are stopped during June to August, due to voluntary close season, therefore, no data for these three months is available. Increased in the catches of tropical tuna in subsurface gears is the main reason which motivated tuna gillnet fishermen from Pakistan to shift from surface to subsurface gillnetting (Moazzam and Khan, 2019).



Fig. 5. Tropical tunas on board gillnet vessel

## CONCLUSION

Tropical tuna species (Fig.5) forms the important part of the tuna fisheries in Pakistan (Moazzam, 2018). Yellowfin tuna is the most dominating tuna species observed since 1987 which is followed by longtail tuna (*Thunnus tonggol*). A marked seasonality in the tropical tuna landings was noticed with a peak in January and September during 2018. There is a voluntary two month close season observed during June and July by the tuna gillnets fishermen mainly because of extremely rough weather and intensive wave action due to summer monsoon. However, in 2018, the closed season was observed from first week of May to second week of August because of low prices in neighboring country.

During 2018, tropical tuna landings was observed to be about 46.89 % lower than 2017 which is mainly because of operation of tuna fleet in coastal waters as compared to previous years when the fleet was operating in comparatively deeper and offshore deeper waters. This is because of low prices of tropical tunas in the neighboring country owing to unprecedented decrease in currency value. In addition, fishermen kept their operation closed during mid May to mid August as compared to normal close season during June and July because of the same reason.

Bigeye tuna (*Thunnus obesus*) is seldom caught by Pakistani gillnet vessels (Fig. 6). This may be because of geographical distribution of bigeye tuna in Indian Ocean. According to Lee *et al.* (2005) bigeye tuna mainly distributed in tropical waters of Indian Ocean between 10°N and 15°S which is an area seldom fished by Pakistani gillnetters. Mohriet *al.*, (1991) observed that low catches in the north high latitude region of the Arabian Sea.



Fig. 6. Bigeye tuna (*Thunnus obesus*) seldom caught in Pakistani water. This specimen was caught by crew based observer Muhammad Islam.



Despite decrease in the landings of tropical tuna including both yellowfin and skipjack in Pakistan, the stock of two species are over exploited in the Indian Ocean (IOTC, 2018). In order to ensure that the tropical tuna stocks are not over-exploited it is recommended that:

- TAC should be applied and implemented for maintaining skipjack catches in the Indian Ocean, there has been a drastic over catch by many fleets, there is a dire need to activate/trigger the harvest control rules and apply the Resolution 19/01
- Consideration of extending Resolution 19/01 for all fleets regardless of their area of operation to ensure long-term sustainability, potentially allowing a timeframe for states having an over catch within EEZ to have catch limits
- There is no one rule that fits all - there is a need to manage multi-species, one species at a time is time consuming and cumbersome - allow HS for key tuna species to be adopted in parallel
- Develop and adoption of a robust yellowfin tuna rebuilding plan that encapsulates all fleets for reduction targets regardless of their size and area of operation

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