10TH WORKING PARTY ON NERITIC TUNAS (WPNT10)

STATUS OF NERITIC TUNA IN PAKISTAN WITH SPECIAL REFERENCE TO LONGTAIL TUNA

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ABSTRACT

Neritic tuna contributes substantially to the total fish landings of Pakistan. It is estimated that neritic tuna alone have a share of about 44.32 % in the total landings of tuna in 2019. Of the five species of neritic tuna, longtail tuna (*Thunnus tonggol*) contributes 3,242 m. tons in 2019 as compared to 11,985 m. tons in 2018. Landings of frigate tuna (*Auxis thazard thazard*) during 2019 was recorded to be 7,619 m. tons (10,986 m. tons in 2018). Kawakawa (*Euthynnus affinis)* landings in 2019 was 1,236 m. tons as compared to 4,123 m. tons in 2018. Other two species i.e. bullet tuna (*Auxis rochei*) and striped bonito (*Sarda orientalis*) contributed insignificantly in the total tuna landings of Pakistan.

Landings of neritic tuna were observed to have decreased in 2019 by 55.34 % as compared to 2018. This decrease in landings is attributed to many factors including early closure of the fishing season in early April 2019 and its continuation till late August 2019 because of low catches and fluctuating low prices of tuna in the market as well as annual close season (June and July). Environmental factors including high temperature during August to October and unprecedented massive jellyfish bloom of *Crambionella orsini* during October and December 2019 (and even onward in 2020) forced fishermen to stop or limit fishing operations during 2019.

Longtail tuna, since fetch higher prices like tropical tuna in local market, therefore, fishermen tend to fish in the areas known for high catches of this species. There are two main peak seasons of longtail tuna; first peak in the catch was observed between March and May and second during September and December; with little decrease during November. The size range of longtail tuna was observed to be between 21 and 96 cm with peak at 66 cm. The paper also discuses about fishing grounds of longtail tuna.

INTRODUCTION

Gillnetting for neritic tuna is an important component of the coastal fisheries of Pakistan as a major part of the artisanal fleet is engaged in this fishing. Gillnets consisting of monofilament and multifilament are used for catching neritic tunas. Monofilament net is mainly used for catching frigate (*Auxis thazard thazard*) and bullet tunas (*Auxis rochei*) whereas multifilament nylon nets are used for catching neritic tunas including longtail tuna (*Thunnus tonggol*), kawakawa (*Euthynnus affinis)* and striped bonito (*Sarda orientalis*) as well as tropical tunas.

Information about neritic tuna fisheries of Pakistan is known through the work of Ahmed (1989), Imad (1988), Griffiths *et al*., (2019), Kazmi *et al.,* (2019), Moazzam (2011, 2012a-c, 2014, 2018), Moazzam and Ayub (2015, 2017), Moazzam *et al.*,

(2016, 2019) and Nawaz and Moazzam (2014). These studies were based mainly on the fisheries statistical data being published by Marine Fisheries Department, Government of Pakistan and also on the information collected through the Crew-Based Observer Programme initiated by WWF-Pakistan.

Based on the information generated through 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 2019 was also carried out. These datasets were provided to IOTC by Marine Fisheries Department, Government of Pakistan and a part of it was presented in WPNT07 (Moazzam and Ayub, 2017).

MATERIALS AND METHODS

In 2012, WWF-Pakistan initiated a crew based observer programme to collect information about catches of tuna and tuna-like species as well as of the bycatch non-target species in the tuna gillnet fisheries of Pakistan (Moazzam and Nawaz, 2017). This programme has continued, with a growing number of participating fishing crews, each year since 2012. There were 75 observers that were engaged in data collection programme. The programme, although has completed in September 2019 but still most of the fishermen have continued to provide information till December 2019.

Tuna fishing operations take place throughout the year except during June and July, which is closed season, coinciding with rough sea conditions generated by the southwest monsoon. The tuna vessels generally set 6-8 km long gillnets before sunset and retrieve them the next morning after a soak time of about 12 hours. The information about tuna species (including neritic tuna) is recorded on daily basis on log sheets especially designed for the programme.

RESULTS

It is estimated that neritic tuna have a share of about 44.32 % in the total landings of tuna in 2019. Neritic tuna landings during 2019 was observed to be comparatively lower than previous years (Table-I), rather the landings of neritic tuna collapsed during 2019. Of the five species of neritic tuna, longtail tuna (*Thunnus tonggol*) contributes 3,242 m. tons in 2019 as compared to 11,985 m. tons in 2018. Landings of frigate tuna (*Auxis thazard thazard*) during 2019 was recorded to be 7,619 m. tons (10,986 m. tons in 2018). Kawakawa (*Euthynnus affinis)* landings in 2019 was 1,236 m. tons as compared to 4,123 m. tons in 2018. Other two species i.e. bullet tuna (*Auxis rochei*) and striped bonito (*Sarda orientalis*) contributed insignificantly in the total tuna landings of Pakistan.

Although there was an overall decrease of 24.11 % in the landings neritic tuna was observed during 2018 as compared to 2017 but in 2019 it was observed to be 55.34 % as compared to 2018 landings (Fig.1). Major decrease in 2019 was noticed in cases of longtail tuna and kawakawa where the decreases of 72.95 % and 70.82 % were noticed as compared to same period of 2018 (Fig. 2; Table-I). In case of frigate tuna this decrease in 2019 was observed to be 30.65 % less than 2018 landings.

Table-I. Landings of tuna species during 2018 and 2018 in Pakistan

Species	Scientific Name	2018	2019	% Decrease
Neritic Tuna				
Longtail	*Thunnus tonggol*	11,985	3,242	- 72.95
Kawakawa	*Euthynnus affinis*	4,123	1,236	- 70.02
Frigate tuna	*Auxis thazard*	10,986	7,619	- 30.65
Bullet tuna	*Auxis rochei*	2	2	-
Striped Bonito	*Sarda orientalis*	3	3	-
Subtotal		**27,099**	**12,102**	**-55.34**
Tropical Tuna				
Yellowfin tuna	*Thunnus albacares*	16,541	6,721	- 59.37
Skipjack	*Katsuwonus pelamis*	2,318	789	- 65.96
Subtotal		**18,859**	**7,510**	**- 60.18**
Tuna NEI				
Tunas NEI		**5,120**	**7,695**	**50.29**
TOTAL		**51,078**	**27,307**	**- 46.54**

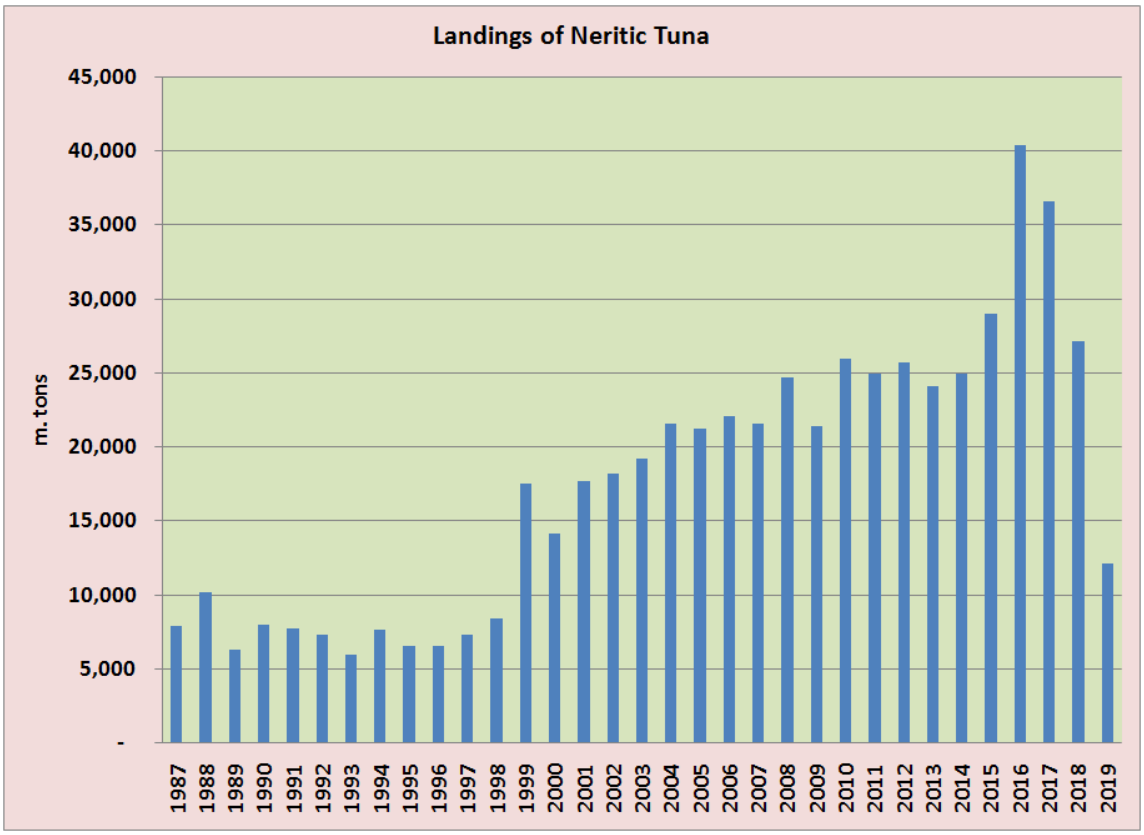

Fig. 1. Landings of neritic tuna of Pakistan (1987-2019)

A decrease of 50.18 % was also noticed in case of tropical tunas in 2019 as compared to 2018 as well. Yellowfin tuna (*Thunnus albacores*) landings decreased by 59.57 % and

skipjack tuna (*Katsuwonus pelamis*) landings in 2019 is decreased by 65.96 % as compared to 2018

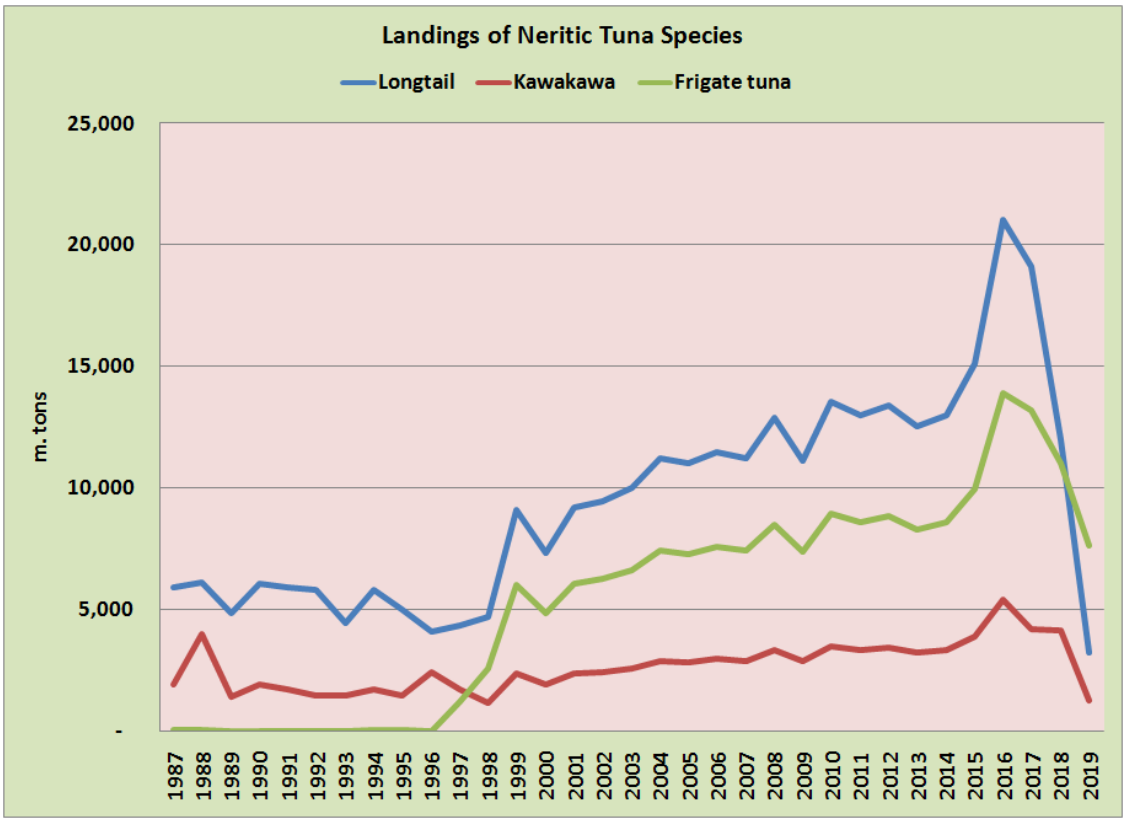

Fig. 2. Landings of neritic tunas species in Pakistan (1987-2019)

Unprecedented decrease in the landings of neritic tunas (as well as tropical tunas) was recorded during 2019 (Fig.1-2; Table-I) except in case of category Tuna nei which mainly includes tuna caught by small scale vessels along Balochistan Coast. The breakdown of species in Tuna nei is not available but it consists mainly of neritic tuna especially kawakawa and frigate tuna.

FISHERIES OF LONGTAIL TUNA

Among the neritic tunas, longtail tuna (*Thunnus tonggol*) is considered to be most important (Fig. 3). Longtail tuna and tropical tunas (yellowfin and skipjack) fetch higher prices in the market in Pakistan because of their export to neighbouring country for canning purposes. Fishermen, therefore, prefer to operate in areas where landings of longtail, yellowfin and skipjack tunas are higher. Main fishing ground of longtail tuna is located along the coastline, however, in some season especially during winter, longtail tuna is also found in the deeper part of the ocean along continental margin.

There are two main peak seasons of longtail tuna (Fig. 4). First peak of the catch was observed between March and May and second during September and December; with little decrease during November. During March and May, tuna fishing fleet start operating in the coastal waters mainly along Balochistan coast mainly to target narrow-barred Spanish mackerel and queenfish. Because of their operation in coastal waters, the catch of longtail tuna also increases. During September to December, tuna fleet operates along offshore waters; however, a part of the fleet operates on the wide continental shelf along Sindh coast resulting in high

catches especially during December. The size range of longtail tuna is between 21 and 96 cm with peak at 66 cm (Fig. 5). Population parameters of longtail tuna are being analysed and will be presented in the nest meeting of the Working Party on Neritic Tuna.

Fig. 3. Longtail tuna (*Thunnus tonggol*) at Karachi Fish Harbour

DISCUSSION

During last two years, the landings of neritic and tropical tunas are decreasing, after achieving a maxima in 2017 (Fig. 1). The decrease in landings of neritic tunas (as well as other tuna species) is not because of status of their stocks or fishing intensity but it is because of issues related to fishing operations. The main causes of decline in catches of neritic tunas include:

Operation Period of Tuna Vessels

In 2018 majority of the fishermen closed their annual operation in late April because of low catches (Moazzam *et al.*, 2019). A similar situation prevailed in 2019 due to which fishermen closed their operation in early April, 2019 (Moazzam, 2020b). Usually a voluntary two month closed season for tuna fishing is observed between June and July, however, in 2019, tuna fishing was stopped by fishermen about one and half months earlier than usual. The new fishing season was started in late August 2019. As such no tuna catches were made during the four-month which included two month summer closure.

Unreliable Prices of Longtail Tuna and Tropical Tunas

Longtail tuna (as well as tropical tunas) is transported/transhipped to neighbouring country for canning purposes. Since 2017, the prices for tunas were extremely unreliable in the neighbouring country mainly because of currency transactions (Moazzam, 2020b; Moazzam *et al.*, 2019). There is no local consumption of tunas in Pakistan and there is no other marketing channel that can absorb landings of longtail tuna and tropical tunas, as such, there was no incentive for fishermen to catch these species tuna with low prices prevailing in the market. As a last resort, the tuna

fishermen shifted their operation to coastal waters to target narrow barred Spanish mackerel and queenfishes which has reliable local market. However, during 2019, catches of narrow barred Spanish mackerel and queenfishes were much lower than their expectation, therefore, most of the fishermen closed their operation in early April, 2019 and restarted their operations in late August, 2019.

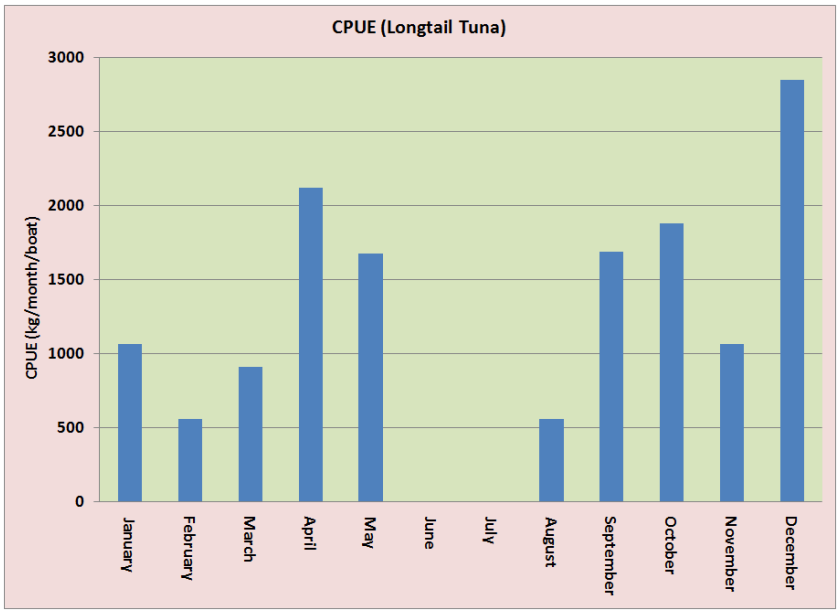

Fig.4. CPEU (Kg/month/boat) of Longtail Tuna from Pakistan

High Seas Surface Temperature (SST).

During the summer months in 2019, the sea surface temperature (SST) was observed to be unusually very high, with a possible oceanic heat wave in the Arabian Sea (Moazzam, 2020b). Fishermen reported very poor catches of tunas in late August to October, 2019 because of high seawater temperature. A number of tuna vessels that started their operation in late August, 2019 stopped fishing after their first trip of the new season due to this reason.

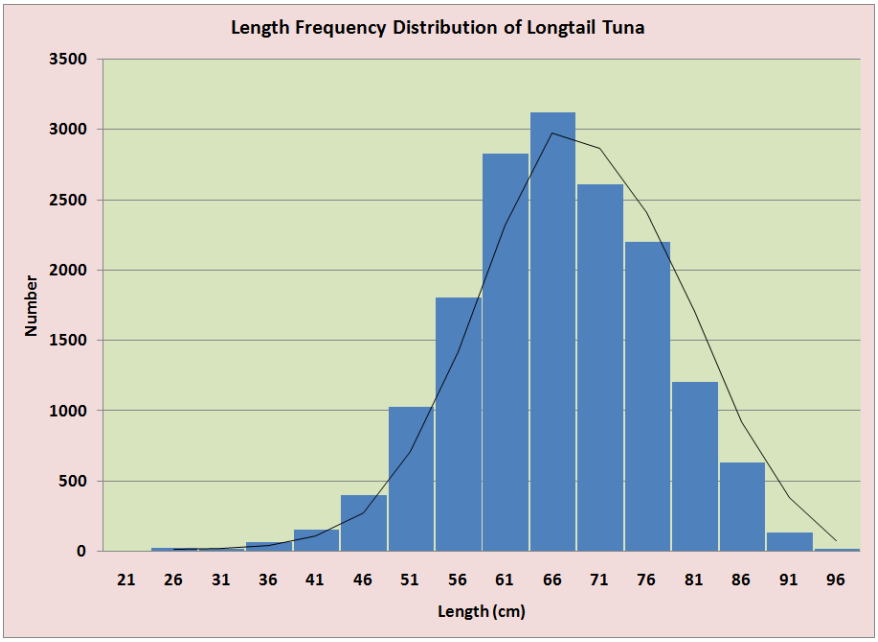

Fig. 5. Longtail Tuna (Length Frequency data)

Bloom of Jellyfish

An unusual bloom of the jellyfish (*Crambionella orsini*) appeared in the southern part of Arabian Sea (between 17^{o}N and 19^{o}N) in September which spread to almost entire Arabian Sea by the end of October, 2019 (Gul, 2020; Moazzam, 2020a, 2020b). Because of dense bloom in 2019 (which is still continuing in June 2020) fishermen could not operate because of fouling and choking of their gillnets as well as because of wastage of time that is spent on removing the jellyfish from the gillnets (Moazzam, 2020b). This bloom forced some of the fishermen to stop their operations whereas only a few were able to manage fishing from September 2019 onward. Fishermen also reported poor catches of tuna species due to the jellyfish bloom.

The major decrease in the annual landings of neritic tuna in Pakistan, therefore, cannot be attributed to the availability of tunas in the Northern Arabian Sea but mainly because of the operational reasons which include low prices, high seawater surface temperature (SST) and massive bloom of jellyfish (*Crambionella orsini*) which forced fishermen to stop their fishing operations well before annual close season (June and July) and also intermittently to avoid jellyfish and high SST.

REFERENCES

Ahmed, J., 1989. An overview of tuna fisheries of Pakistan. Indo-Pacific Tuna Development and Management Programme. IPTP/89/GEN/16:20-32.

Imad, A., 1988. Some observation on the tuna fisheries of Pakistan. Indo-Pacific Tuna Development and Management Programme. IPTP/89/GEN/13: 16-23.

Griffiths, S. P., Leadbitter, D., Willette, D., Kaymaram, F. and Moazzam, M., 2019. Longtail tuna, *Thunnus tonggol* (Bleeker, 1851): a global review of population dynamics, ecology, fisheries, and considerations for future conservation and management. Rev Fish BiolFisheries 29:1-42.

Gul, S., 2020. Occurrence of Jellyfish *Crambionella orsini* (Vanhöffen, 1888) (Cnidaria: Scyphozoa) along the coast of Pakistan. World J Biol Biotech. 5: 31-32.

Kazmi, S. M. R., Shahid, U., Khan, B., Nawaz, R., Khan, J. U., Razzaque, S. A., Ayub, A. and Moiz, A., 2019. Investigating capture rates of Neritic tuna species in the tuna gillnet fisheries of Pakistan; results from four tuna gillnet vessels. Ninth Session of IOTC Working Party on Neritic Tuna (WPNT09) 01-05 July 2017. Seychelles. IOTC-2019-WPNT09-INF01. 9.,

Moazzam, M., 2011. Tuna fishing of Pakistan: Impact of transboundary migration on exploitation levels. In: Proceedings of Seminar ”Transboundary Coastal and Marine Protected Areas with Special Priorities for Spawning Grounds (27-28 May, 2009). (Eds. Wahab, A., Moazzam, M. and Hasan, A., (Editors) 2011. Zoological Survey of Pakistan, Islamabad. Pp. 49-60.

Moazzam, M., 2012a. Tuna Situation Analysis. WWF-Pakistan Report. Karachi 43p..

Moazzam, M., 2012b. Status of fisheries of neritic tuna in Pakistan. Second Session of the Working Party on Neritic Tuna (WPNT02) 19-21 November, 2012 Penang, Malaysia. IOTC 2012 WPNT02 13.

Moazzam, M., 2012c. The impacts of piracy in the Pakistani fisheries sector: case study of Pakistan. In: Seminar on “The impacts of Piracy on Fisheries in the Indian Ocean” Mahé, Republic of Seychelles, 28 – 29 February 2012. European Bureau for Conservation and Development.

Moazzam, M., 2014. Update on the neritic tuna fisheries of Pakistan with special reference to frigate tuna (*Auxisthazardthazard*). Fourth Session of IOTC Working Party on Neritic Tuna (WPNT04) 29 June- 2 July, 2014. Phuket, Thailand IOTC 2014 WPNT04 33.

Moazzam, M., 2018. Status of neritic tuna fisheries of Pakistan. Eight Session of IOTC Working Party on Neritic Tuna (WPNT08) 21-24 August 2016. Mahe, Seychelles..IOTC- 2016-WPNT08-17.

Moazzam, M., 2020a. Jellyfish *Crambionella orsini*: a menace for fishing in the Arabian sea. Wildlife and Environment 26: 15.

Moazzam, M., 2020b. Unprecedented decrease in landings of tropical tuna in Pakistan during 2019. 22nd Working Party on Tropical Tuna (WPTT): Data Preparatory Meeting. Seychelles, 22-26 June, 2020. IOTC-2020-WPTT22(DP)-INF05. 6p.

Moazzam, M., and Ayub, S., 2015. Changes in the landings of neritic tuna and tuna like species in Pakistan during last three years. Fifth Session of IOTC Working Party on Neritic Tuna (WPNT05) 26-29 May 2015. Zanzibar, Tanzania. IOTC 2015 WPNT05 25.

Moazzam, M. and Ayub, S., 2017. Catch reconstruction of neritic tuna landings of Pakistan based on data collected by WWF-Pakistan’s Crew Based Observer Programme. Seventh Session of IOTC Working Party on Neritic Tuna (WPNT07) 10-13 July 2017. Male, Maldives. IOTC- 2017-WPNT07-11.

Moazzam, M. and Nawaz, R. 2017. Arabian Humpback and Baleen Whale sightings along the Pakistan Coast: Information Generated Through WWF Pakistan’s Fishing Crew Observer Programme. IWCSC_67A_CMP_05.

Moazzam, M., Ayub, A., Khan, B. and Nawaz, R., 2019. Distribution, abundance and some aspects of biology of kawakawa (Euthynnus affinis) from Northern Arabian Sea with an update on neritic tuna fisheries of Pakistan. Ninth Session of IOTC Working Party on Neritic Tuna (WPNT09) 01-05 July 2017. Seychelles. IOTC-2019-WPNT09-16_Rev1. 12p.

Moazzam, M., Nawaz, R., and Ayub, S., 2016. Update on the neritic tuna fisheries of Pakistan. Sixth Session of IOTC Working Party on Neritic Tuna (WPNT057) 21-24 June 2016. Mahe, Seychelles.. IOTC- 2016-WPNT06-24.

Nawaz, R., and Moazzam, M., 2014. An assessment of cetacean mortality in the tuna fisheries of Pakistan. IOTC-2014-WPEB 10-INF25. 1-89.