Received: 4 November 2016

Status of Tropical Tuna Gillnet fisheries in Pakistan

Muhammad Farhan Khan
Assistant Fisheries Development Commissioner
Ministry of Ports and Shipping
Government of Pakistan

Pakistan is endowed with huge resources for development of fisheries sector, having 1100 km coastal belt situated in the province of Sindh and Baluchistan but unfortunately minimal aquaculture exists in the country. Marine fisheries today is considered to be amongst the best and major source of food security, income generation, poverty alleviation, foreign exchange and food substitute. In Pakistan at present it is estimated that total of 01 million people have direct and indirect employment in this sector. The contribution of fisheries sector in country's GDP is 1% and Pakistan's marine fisheries sector is contributing approximately 80% of total fish production. Gill nets, cast nets, handlings and long liners are still the traditional gears that are used by fishers in the local fishing industry. Marine fish production peaked in 1990s, declined in the early 2000s and has been stable at around 350,000 metric tonnes per year since 2005. Pakistan's marine fisheries are highly diverse with about 150 species of fish of commercial importance. There has been no sustained increase in fish production from marine sector in spite of significantly increased fleet size.

Tuna support some of the more important fisheries in Pakistan . There are eight known species of tuna landed in Pakistan. However, only five species contribute significantly to commercial catches (Khan 2012b): longtail tuna (Thunnus tonggol), yellowfin (Thunnus albacares), skipjack (Katsuwanus pelamis), frigate tuna (Auxis thazard), and Kawakawa (Euthynnus affinis). The official reported data does not include any landings of bigeye tuna (Thunnus obesus). According to Fonteneau (2009), vessels of Pakistan and Iran's oceanic gillnet fisheries operating in central Western Indian Ocean waters may have greatly underreported catches of bigeye tuna. It has been predicted that in some cases, bigeye catches have been misclassified as yellowfin tuna catches. In 1990, the Government of Pakistan permitted four foreign companies to operate in the EEZ for an experimental resource survey of tuna and tuna-like species (Majid 1995). These survey vessels operated until 1993, but in that same year, 12 Taiwanese longliners were licensed to fish under the Pakistani flag, paying fixed royalties and annual license fees (Anon 1995; Majid 1995; Khan 2006). These joint-ventures drastically depleted the tuna resources in the area, specifically

yellowfin tuna, with catches reaching a peak of 30,817 t in 1993 and then dropping to 4,604 t in 1994. The stock of yellowfin was thought to have recovered 12 years later, when in 2005 and 2006, another 25 Taiwanese tuna longliners obtained licenses to fish in Pakistan's EEZ. During this period, a total of 7,870 t of yellowfin tuna was caught by these vessels, which again depleted the stocks.

Landings of tuna, specifically yellowfin, peaked between 1991-1994 when the Pakistani government approved an experimental resource survey, allowing more than 50 Taiwanese longliners to fish within Pakistan's EEZ (IPTP 1991; Majid 1995; Khan 2012c). Tuna landings attributed by Taiwanese (and assumed Chinese, Pauly et al. 2013) industrial longliners, fishing in the EEZ from 1991-2009, were subtracted from the total tuna catch for all species and reallocated as Taiwanese (and Chinese) catch. The remaining catches were assumed to be domestic catch from inshore and offshore gillnet operations, fishing within the EEZ. Little information is available on catches by the gillnet fishery. However, it is estimated that the inshore gillnet fishery takes 30-40 % of the skipjack catch. Based on information given by the IOTC and FAO (Gillett 2011), it was assumed that 10% of the gillnet catches were made by inshore artisanal fishing operations and the remaining 90% by offshore fleets, which for the purpose of this report, were categorized as industrial catch. Pakistani gillnetters are known to also fish in the EEZ of Iran, Somalia and the high seas (Khan 2012c); however, estimates of catches outside the EEZ were not available.

Landings of tuna are noticeably different for vessels operating offshore in waters of Pakistan and neighboring countries such as Somalia and those operating in inshore waters. Those operating in inshore waters have longtail (33%) and skipjack (32%) dominating, with kawakawa (19%), yellowfin (14%) and frigate tuna (2%) also contributing to landings. In offshore operations, skipjack alone contributes 83 %, followed by yellowfin (12 %), whereas other tuna species only contribute about 5% (Khan 2012c). These percentages were applied to the inshore and offshore tuna landings in Pakistan's EEZ from 1950-2010. Catch composition for joint-venture or foreign operated vessels from 1991-2010 was determined to consist in equal proportions of skipjack and yellowfin (35% each), with the remaining percentage of landings consisting of longtail (25%) and kawakawa (5%) (Khan 2012c). These compositions were based on analysis of data from

2005-2008. However, landings of tuna species have likely fluctuated since 1950, due to changes in the fleet size, type of gear and presence of industrial tuna longlining fleets in Pakistan's EEZ.

Materials and methods

For making a review of the fishing practices, landings and disposal of the catch, information was obtained from published literature, statistical data and government archives. In addition, monitoring of by-catch through landings data at the major fish landing centers Fisheries statistical data reported by Pakistan have historically remained debatable and unreliable. It is the responsibility of the Federal government and the Marine Fisheries Department (MFD) to report fisheries statistics to international agencies such as the FAO. The data collected and reported to the FAO are compiled by the MFD after receiving them from various fishery agencies and departments in Pakistan. In the past, national landings data were intermittently recorded from the eight most important landing sites along the Balochistan coast. However, this system quickly deteriorated (M.M. Khan, pers. obs.) and it is not known if these sampled data were scaled up to account for un-sampled landing sites. Landings were at times recorded at Karachi harbor; yet separate data are not available for a number of landing centers along the Sindh coast. The major issue lies in the lack of effective communication and cooperation between the statistical collectors, management, enforcement personnel and stakeholders. This non-integrative management system, combined with a lack of standardized and formalized routine reporting, data collection and simple expansion, is likely due to inadequate resources.

Gillnet is the main fishing gear used for catching tuna and other large pelagic fishes in many countries of the world including Pakistan (IOTC, 2013). This net is considered to be an indiscriminate fishing gear which enmeshes not only target species (tuna) but also a large number of non-target animals (Tregenza et al., 1997; Tregenza and Collett, 1998; Lewison et al., 2004; Gillet, 2011)

Results

Fishery plays an important role in Pakistan's economy and is considered to be a source of livelihood for the coastal inhabitants. A part from marine fisheries, inland fisheries (based in rivers, lakes, ponds, dams etc.) is also very important activity throughout the country. Fisheries share in GDP although very little but it adds substantially to the national income through export earnings. Government of Pakistan is taking a number of steps to improve fisheries sector which includes inter alia strengthening of extension services, introduction of new fishing methodologies, development of value added products, enhancement of per capita consumption of fish, up-gradation of socio-economic conditions of the fishermen's community. The total fish production (Inland and Marine) is from year 2011-12 to 2015-16 is given in Fig 01. The decreasing trend was found in those years. There has been no sustained increase in fish production from marine sector in spite of significantly increased fleet size. This strongly suggests that overfishing is a continuing issue.

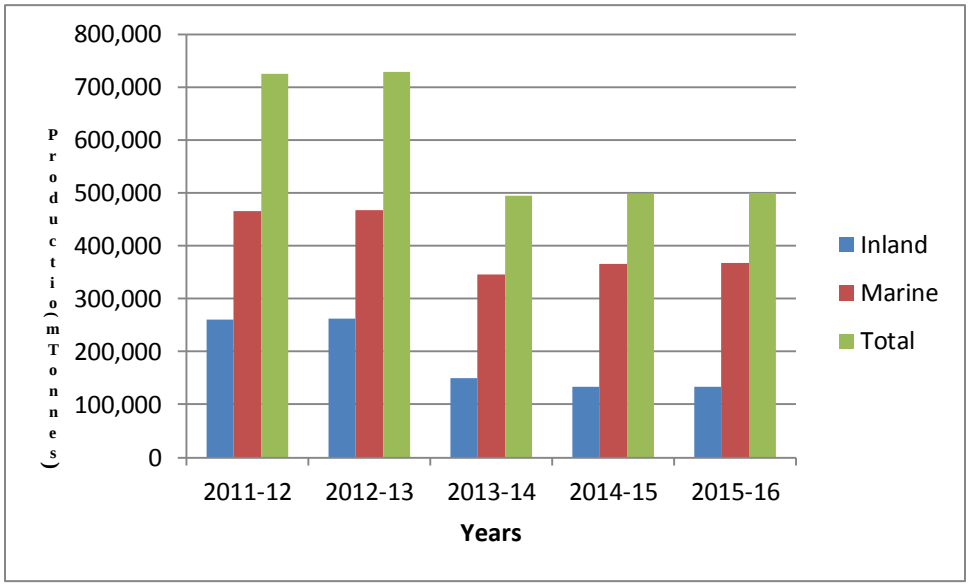

Figure 01: Total Fish Production of Pakistan from year 2011-12 to 2015-16

Tuna Fisheries

There are five species contribute significantly to commercial catches: longtail tuna (*Thunnus tonggol*), yellowfin (*Thunnus albacares*), skipjack (*Katsuwanus pelamis*), frigate tuna (*Auxis thazard*), and Kawakawa (*Euthynnus affinis*). The data regarding the total catch of tuna is given in Figure 02. The data showing the commercial catching of Tuna species from the year 2006 to 2015. The data reveals that highest percentage of catch belongs to Long tail tuna i.e. 33% followed by Skipjack tuna i.e 28%, Yellowfin tuna i.e. 25 % and Kawakawa 14%.

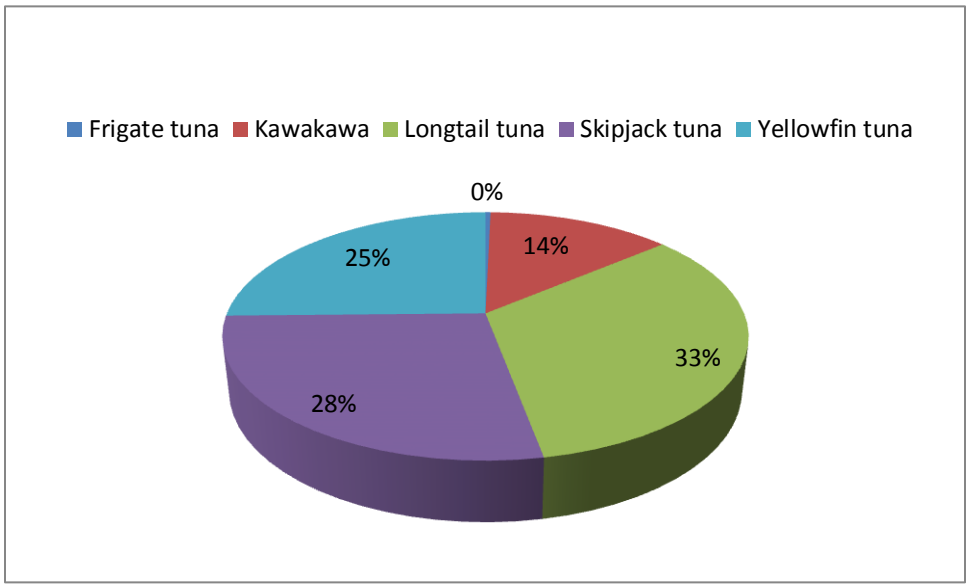

Figure 02: Total Tuna from Gillnet from the Year 2002 to 2015

The data regarding the total catch of tuna in year 2015 is given in Figure 03. The data showing the commercial catching of Tuna species from the year 2006 to 2015. The data reveals that highest percentage of catch belongs to Long tail tuna i.e. 31% followed by Skipjack tuna i.e 27%, Yellowfin tuna i.e. 27 % and Kawakawa 15%.

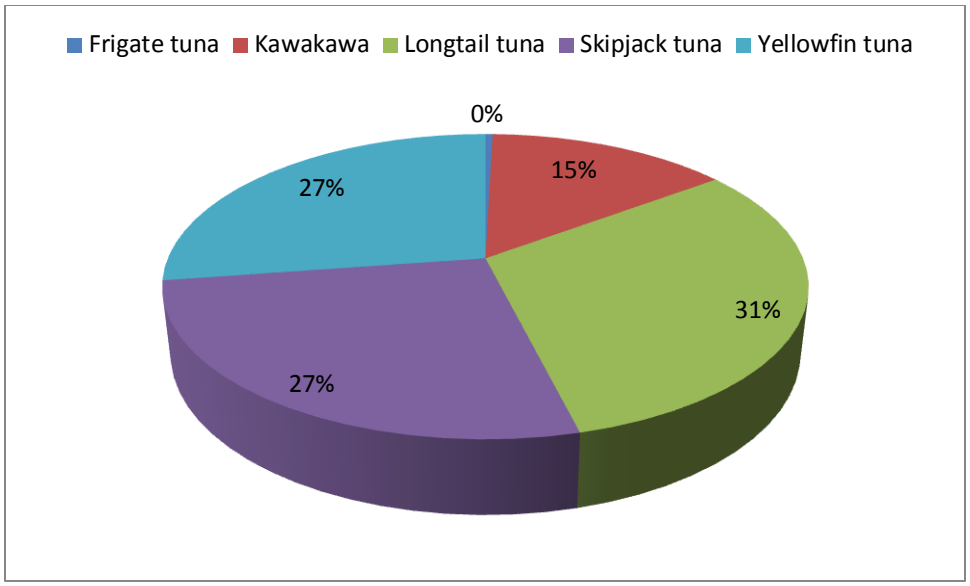

Figure 03: Total Tuna Catch from Gillnet from the Year 2002 to 2015

Tropical Tuna Data

The figure 04 showing the data of two tropical tunas species i.e. Yellowfin tuna and Skipjack tuna in the catch from the year 2002 to 2015. The data reveals that total catch of tropical tunas was 128397 mtons out of which Skipjack has 67049 m tons and Yellowfish fish has 61348 m tons with the percentage of 52% and 48% respectively

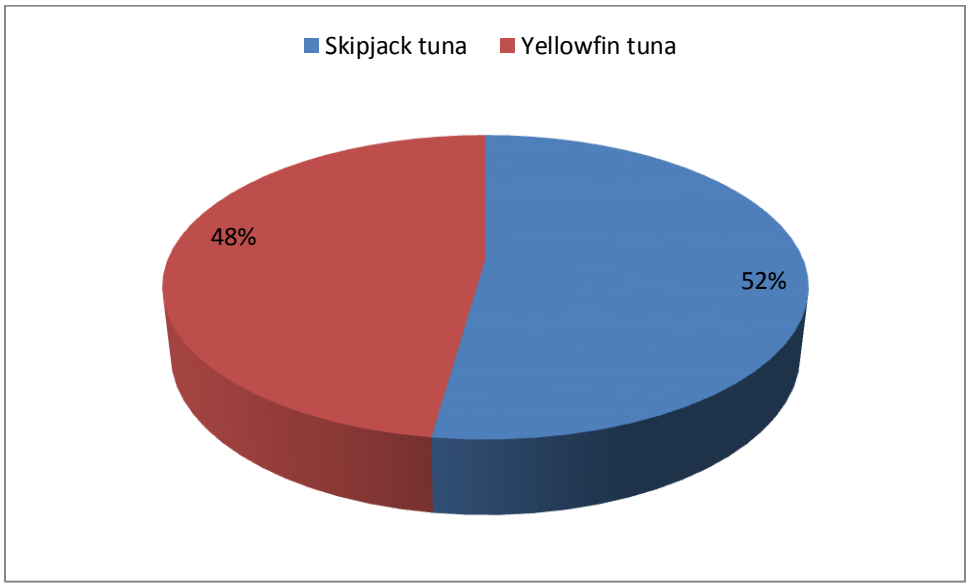

Figure 04: Total Tropical Tuna Catch from Gillnet from the Year 2002 to 2015

The figure 05 showing the data of two tropical tunas species i.e. Yellowfin tuna and Skipjack tuna in the catch from the year 2015. The data reveals that total catch of tropical tunas was 12,344 mtons out of which Skipjack has 6,088 m tons and Yellowfish fish has 6,256 m tons with the percentage of 49% and 51% respectively.

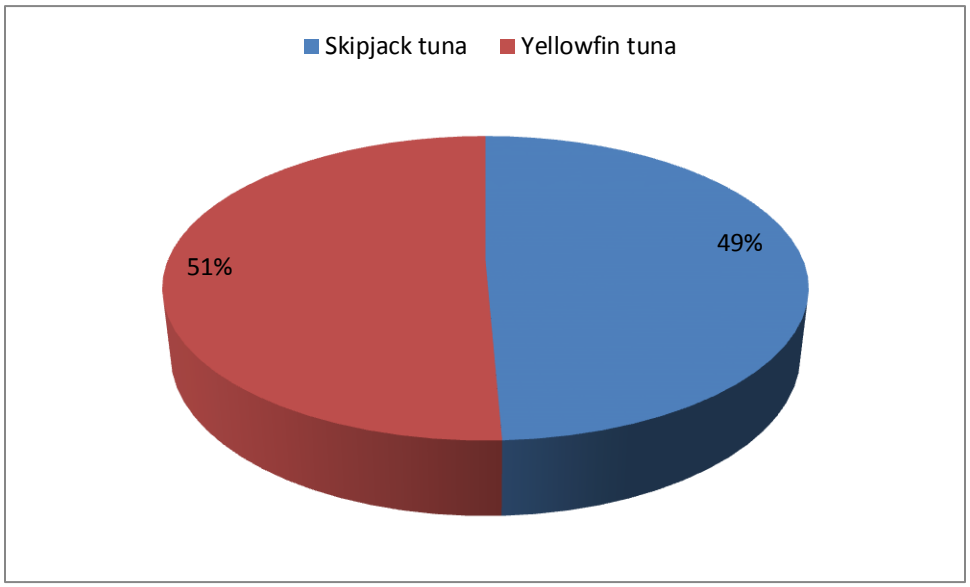

Figure 05: Total Tropical Tuna Catch from Gillnet from the Year 2015

The over all data show that the catching of tropical tuna increasing with the time from year 2002 to 2015 as it is given in fig 06 below

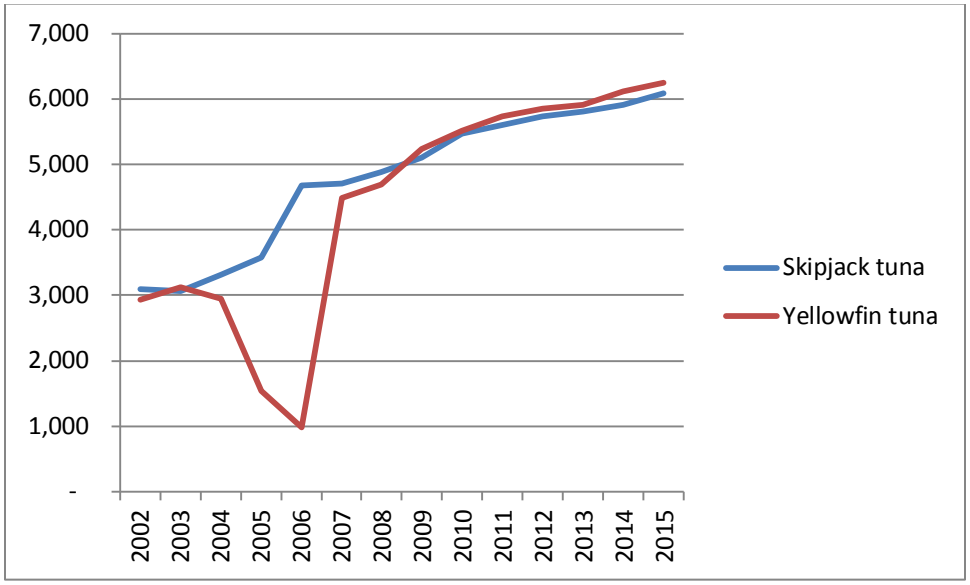

Figure 06: Overall Catch of Tropical Tunas from year 2002 to 2105

The total production of large pelagic fishes during 2002 to 2015 was 457969 **m** tone out of which 242438 Mt belongs to tuna and tuna-like fishes. The total percentage of Tuna catch was 53 % followed by narrow- barred Spanish Mackerel 26%, Billfish 9% and others 12% (rays and Shark) Fig 07.

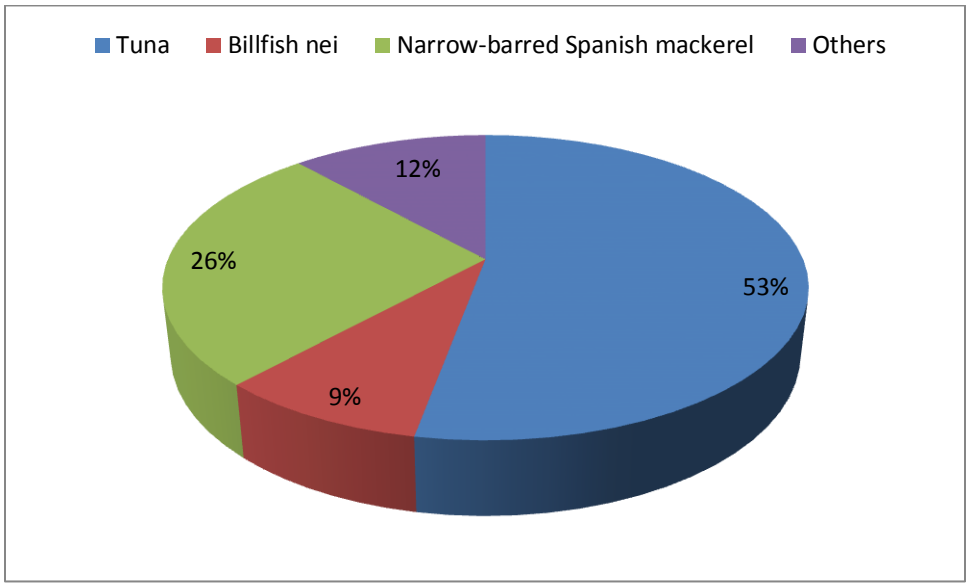

Figure 07: Percent Catch of Tunas and Bycatch from year 2002 to 2105

The total production of large pelagic fishes during 2015 was 266185 **m** tone out of which 22892 Mt belongs to tuna and tuna-like fishes. The total percentage of Tuna catch was 49 % followed by narrow-barred Spanish Mackerel 27%, Billfish 8% and others 16% (rays and Shark) Fig 08.

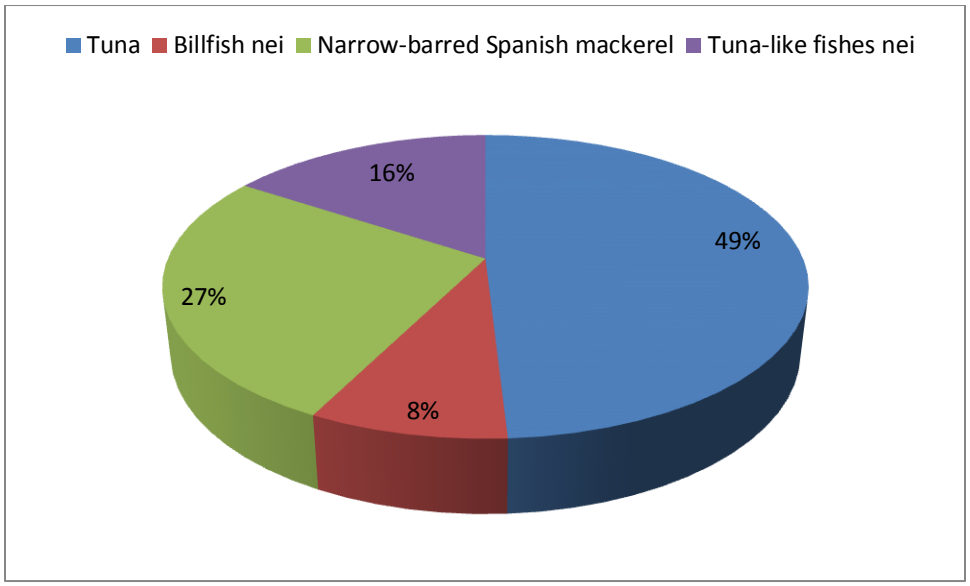

Figure 08: Percent Catch of Tunas and Bycatch for 2105