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Analysis of skipjack tuna *(Katsuwonus pelamis)* landings made by Sri Lankan fishing vessels operated during 2005-2012 with special reference to the nature of the fishing operations

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Abstract

Skipjack tuna (*Katsuwonus pelamis*) landed by Sri Lankan fishing vessels were monitored during the period January 2005 – December 2012 at the major large pelagic fish landing sites and fishery harbours in Sri Lanka. The unloaded skipjack tuna catch of the vessels was recorded. In addition, other parameters in relation with fishing operations were recorded: boat type, used gear type, number of days taken for the completion of the fishing trip etc. During this period, about 8% of skipjack tuna catch had been landed in dry form and the vessels which brought skipjack in dry form were about 1.8% of the total skipjack tuna landed vessels. A number of gear-vessel combinations are being operated in Sri Lanka tuna fishery. Sri Lankan fishing vessels which operate targeting large pelagic fish has been categorized into six categories based on the length of the vessel and other technical features and a clear differentiation among them with respect to the nature of fishing operations and skipjack tuna landings was observed. The skipjack tuna catch of the fishing vessels which fall into the length classes 34’- 40’ and 40’- 50’ were in general higher than the catch of other vessel categories. The least skipjack catch was reported for the vessels engaged in single day fishing in the coastal waters. The trip duration of a multiday fishing craft ranged from 2 – 60 days. However, the average trip duration of a multiday boat is about 8.5 days. The vessels operated with gillnet-longline engaged in a higher number of days for fishing than the boats operated with gillnet alone. The average days fished by the vessels operated with gillnet alone and gillnet-longline were 5.9 and 14.5 respectively.

Introduction

Fisheries sector which comprises of three subsectors namely coastal, offshore/deep sea and inland & aquaculture, plays an important role in the Sri Lankan economy. Offshore/deep sea subsector is the fastest growing subsector among the three subsectors. The rapid production increase in the oceanic tuna fish production over the past few years has greatly contributed to the increased offshore/deep sea fish production in Sri Lanka. Oceanic tuna resources in Sri Lanka mainly comprise of yellowfin tuna (*Thunnus albacares*), big eye tuna (*T. obsesus*) and skipjack tuna (*Katsuwonus pelamis*). In addition, a considerable proportion in the catch of oceanic tuna species is included in the coastal subsector fish production. The annual catch in 2012 of the two major oceanic tuna species, yellowfin and skipjack were 42 780Mt and 53 410Mt respectively (MFARD, 2014). These two species contribute more than 23% of the total marine fish production in 2012. The better quality yellowfin tuna mainly targets the export market and main destinations for Sri Lankan yellowfin tuna products are Japanese and EU markets. However, skipjack tuna are mainly consumed locally and sometimes used for producing dry fish and maldive fish too. Skipjack tuna are mostly landed at the fishing harbours located in the southern coast of Sri Lanka. The present work was undertaken to find out recent trends in skipjack tuna fish landings in Sri Lanka with special reference to the nature of the fishing operations conducted by using different vessel-gear combinations.

Fisheries data

The fisheries data used for this audit was mainly obtained from the port sampling conducted by National Aquatic Resources Research and Development Agency (NARA) of Sri Lanka. The port sampling programme is being conducted in view of collecting catch and effort and biological data of large pelagic fish. The main species concerned under this sampling programme are tuna and tuna like fish. The sampling programme is conducted by NARA at the major large pelagic fish landing sites and fishery harbours in the west, southern and east coasts of Sri Lanka. The skipjack tuna landed by Sri Lankan fishing vessels during the period January 2005 – December 2012 were considered for this audit. The unloaded skipjack tuna catch by the fishing vessels was recorded with other parameters: boat type, used gear type and number of days taken for the

fishing trip etc. For the data collection, enumerators have been stationed by NARA at the major ports and fish landing sites. Apart from the data obtained by NARA port sampling, data and information obtained from secondary sources were also used for this analysis.

Fishing vessels

Fishing vessels which mostly catch skipjack tuna are the multiday fishing vessels which operate targeting tuna and tuna like fish. However, some artisanal fishing vessels which operate in the coastal waters and engage in single day fishing activities may also target tuna and tuna like fish including skipjack but in a lesser degree and such fishing operations mostly are confined to few areas as well as few months of the year. The Sri Lankan fishing vessels which engage in single day and multiday fishing activities potentially targeting tuna and tuna like fish are categorized in Table 1.

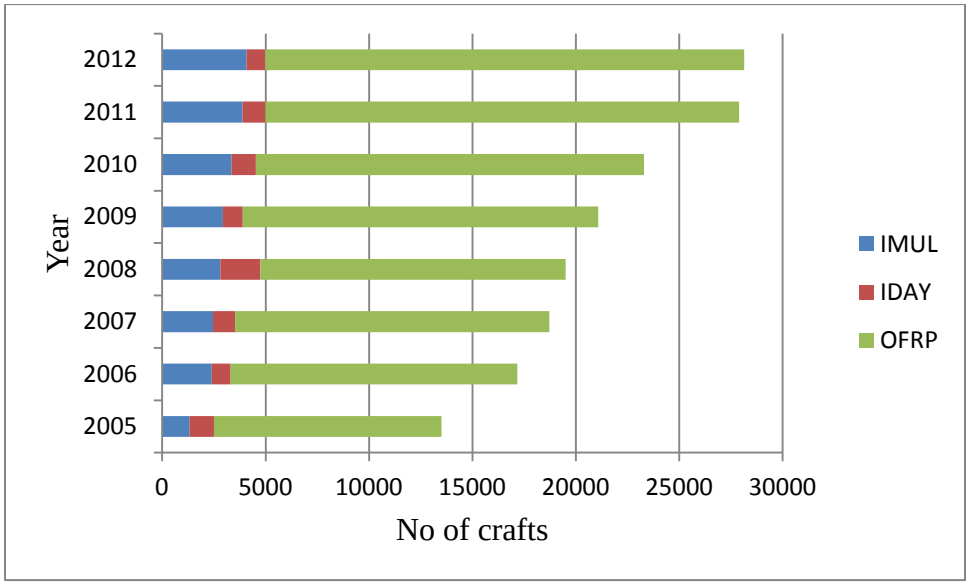
Table 1. Classification of fishing vessels in Sri Lanka operated for potentially targeting tuna and tuna like fish

Class	Fishery	Category	Description
1	Costal Fishery	UN1	5.5 - 7.2 M (17' - 21') FRP dinghy Outboard engine - 8-40 HP (usually 15 - 40 HP) may have GPS Single day boats - assumed to be fishing in COASTAL WATERS
2	Costal Fishery	UN2A	8.8 - 9.8 mm (28' - 34') displacement hull. FRP or wooden. Inboard engine (single) - 40 HP No ice box or insulated fish hold, no gear hauler, or acoustic equipments but, may have GPS Single day boats - assumed to be fishing in

			COASTAL WATERS
3	Offshore/ deep sea fishery	UN2B	8.8 - 9.8 m (28' - 34') displacement hull. FRP wooden. Inboard engine (single) - 40 HP Insulated fish hold - no gear hauler, may have GPS/sounder/fish finder Multi-day boats-assumed to be fishing in OFFSHORE/ DEEP SEA WATERS
	Offshore/ deep sea fishery	UN3A	9.8 - 12.2 m (34' - 40') displacement hull. FRP wooden. Inboard engine (single) - 60 HP - Insulated fish hold and may have gear hauler/GPS/sounder/fish finder Multi-day boats-assumed to be fishing in OFFSHORE/ DEEP SEA WATERS
4	Offshore/ deep sea fishery	UN3B	12.2 m - (40' - 50') displacement hull. FRP or wooden Inboard engine (single) - 60 + HP Insulated fish hold and may have freezer facilities. Gear hauler/GPS/sounder/fish finder Multi-day boats-assumed to be fishing in OFFSHORE/ DEEP SEA WATERS
	Offshore/ deep sea fishery	UN4	15.2 - 18.3 m (50' - 60') Inboard engine, fish storage facility, may have RSW or CSW or freezing facility, gear hauler, GPS, echo-sounder/fish finder, radio communication Multi-day boats-assumed to be fishing in OFFSHORE/ DEEP SEA WATERS

A clear increase in the number of operated IMUL (Inboard Multi-day boats) boats and OFRP (Out-board engine Fiber reinforced) boats in Sri Lanka could be observed for the 2005- 2012

period (Figure 1). However, among OFRP boats, only few boats operate targeting tuna and tuna like fish and their operations are also highly seasonal. Considerably a very high number of OFRP boats are operated targeting small pelagic and demersal fish.



IMUL - Inboard Multi-day Boats (UN2B, UN3A, UN3B and UN4 boats), IDAY - Inboard Single-day Boats (UN2A boats), OFRP - Out-board engine fiber reinforced boats (UN1 boats)

Figure 1. Sri Lankan fishing crafts operated potentially targeting tuna and tuna like fish: 2005 -2012 (Source: MFARD, 2014)

Fishing gear

A range of fishing gear is used in the Sri Lanka tuna fishery. Gillnet, longline and gillnet-longline combination are popular among the fishermen but, various other gear and methods including traditional fishing gear and methods such as pole and line are being used. Apart from that, fishing gears such as ring nets and various gear combinations such as gillnet-handline and gillnet-ring net are also being operated in the tuna fishery.

Skipjack tuna production

A clear increase in the skipjack annual catch could be observed for 1983- 2012 period (Figure 2). The highest production of 66 910Mt was reported in 2010 but, a slight decline in the annual catch was observed for the next two years.

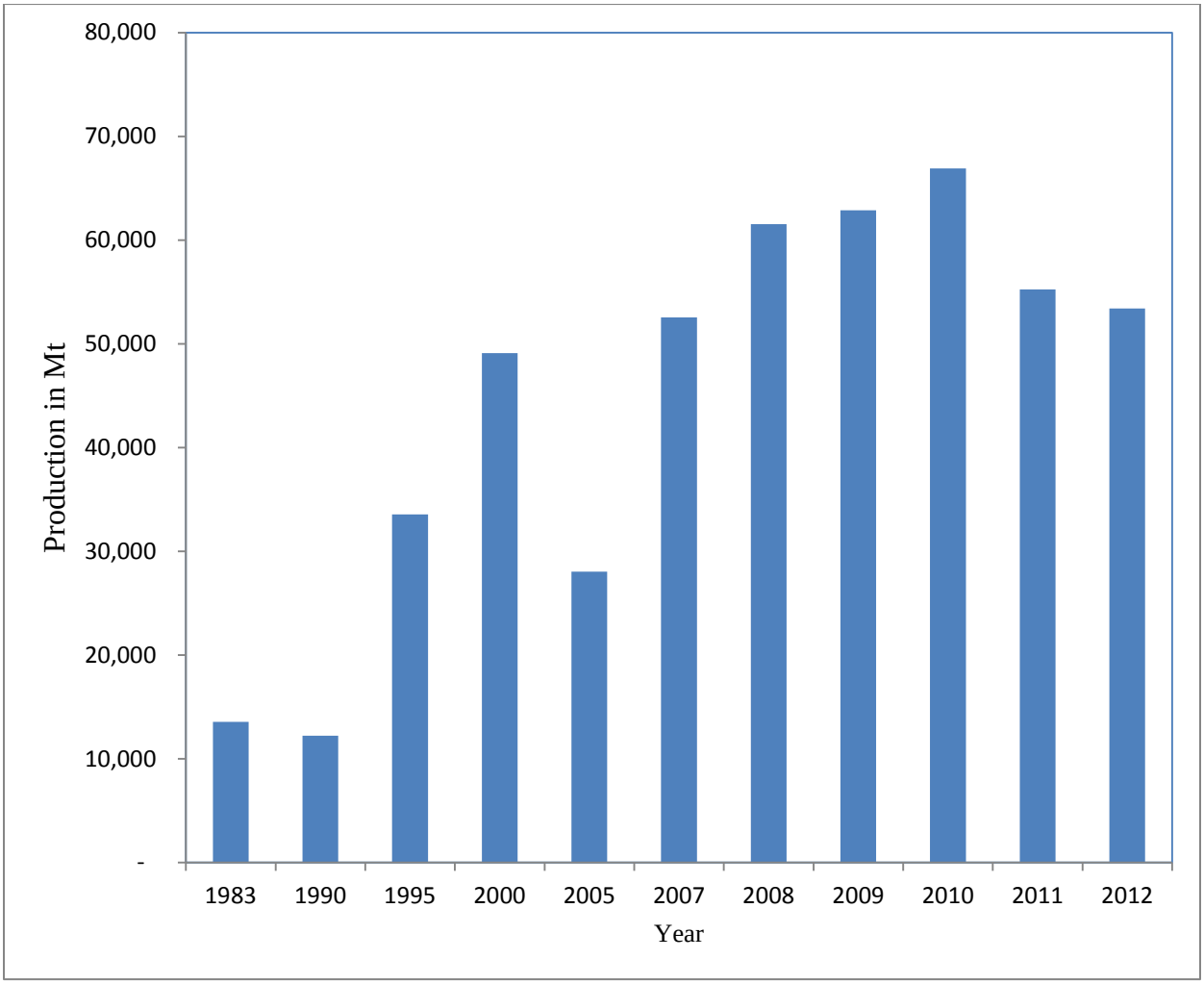


Figure 2. Annual landings of skipjack tuna in Sri Lanka for 1983 -2012 period (Source: MFARD, 2014)

During the period 2005-2012, skipjack tuna has contributed around 63% of the total oceanic tuna landings (Figure 3).

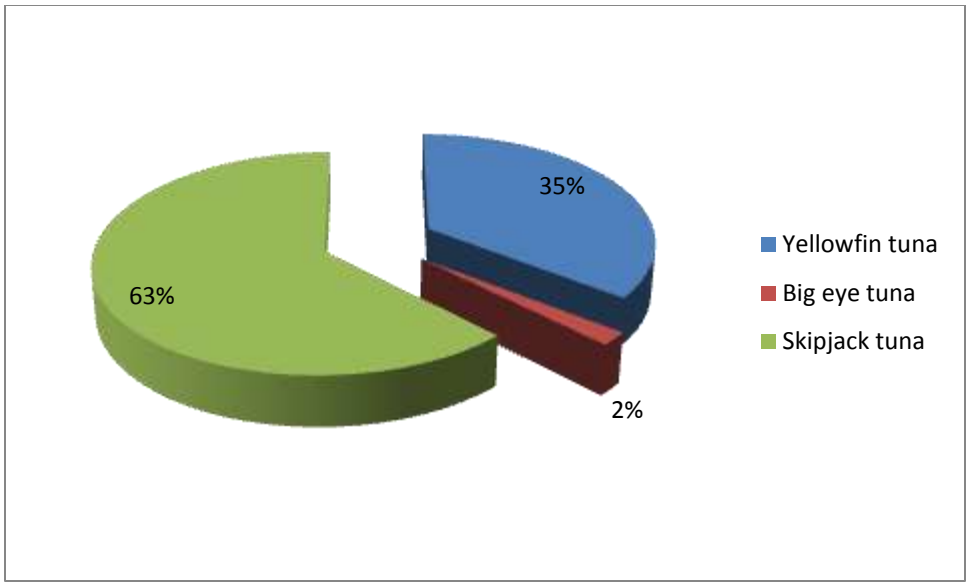
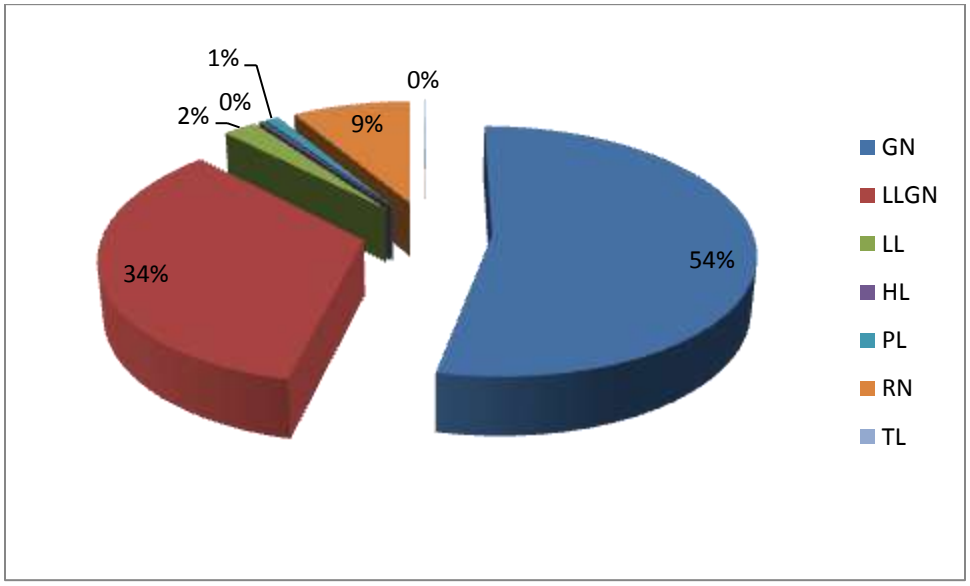


Figure 3. Relative contribution of yellowfin tuna, big eye tuna and skipjack tuna in the oceanic tuna landings in Sri Lanka during 2005 – 2012 (Source: IOTC, 2012)

When multiday fishing crafts are at sea for a long period of time, the skipjack tuna caught from early fishing operations are sometimes dried and finally landed as dry fish. About 8% of the total skipjack tuna had been landed in dry form in the 2005-2012 period and the vessels which brought skipjack in dry form were about 1.8% of the total vessels landed skipjack tuna. Though UN2A and UN4 boats also landed skipjack tuna, they did not land skipjack tuna in dry form. UN2B, UN3A, UN3B boats had landed dried skipjack but, the landed skipjack tuna in dry form were negligible for UN2B boats. However, a considerably high quantity of skipjack tuna was landed by UN3A and UN3B boats and the landed skipjack tuna in dry form by those vessels were about 8.2% and 27% of the total skipjack tuna catch reported against two boat types respectively.

Skipjack tuna production by gear

Though a number of fishing gears contribute to the skipjack tuna fish production in Sri Lanka, gillnet and longline-gillnet gear combination have massively contributed (Figure 4). These two gears account 88% of the total skipjack tuna production in 2011 – 2012 period and relative contribution of the two gears in the skipjack tuna fish production was 54% and 34% respectively.



GN-gillnet, LLGN- longline – gillnet, LL- longline, HL- handline, PL- pole and line, ring net, TL- trolline

Figure 4. Skipjack tuna fish production in 2011- 2012 by gear

Length of a fishing trip

The number of days taken by a multiday fishing craft for the completion of the fishing trip may vary in accordance with gear and craft types. The trip duration of a multiday craft ranged from 2 – 60 days. However, the average trip duration of a multiday boat is about 8.5 days. The average time taken for completion of a fishing trip for UN2B, UN3A, UN3B and UN4 fishing crafts were 7, 13.4, 19.7 and 12.7 days respectively.

The lowest average trip duration of 6 days was reported for UN2B boats operated with longline-handline gear combination whereas the highest average trip duration of 22 days was reported for UN3B operated with longline – gillnet gear combination (Table 2). In general, the average trip duration of UN3B vessels operated with any gear was higher than the average trip duration of any other vessels operated with any other gear.

Table 2. Average trip duration of Sri Lankan multiday fishing boats as per major gear-vessel combinations

Craft type	Gear used	Trip duration in days
UN2B	GN	6.3
UN2B	GR	10.0
UN2B	LG	8.3
UN2B	LH	6.0
UN2B	LL	7.7
UN2B	RN	7.1
UN3A	GN	12.4
UN3A	GR	11.8
UN3A	LG	16.5
UN3A	LH	13.0
UN3A	LL	13.5
UN3A	RN	7.4
UN3B	GN	17.4
UN3B	GR	15.3
UN3B	LG	22.0
UN3B	LH	10.0
UN3B	LL	17.0
UN3B	RN	7.6
UN4	GN	16.0
UN4	LG	11.0

GN- gillnet, GR-gillnet - ring net, LG- longline - gilllnet, LH- longline – handline, LL-longline, RN- ring net

Conclusion

Skipjack tuna is the dominant species in the Sri Lanka tuna fishery and has greatly contributed for supplying the protein need of the Sri Lankan nation. Though several types of fishing vessels are operated in the Sri Lanka tuna fishery, the vessels having the length range 34”-50” are the key vessels that land skipjack tuna in a significant quantity. Also, though, a number of gears catch skipjack tuna, the skipjack tuna catch made by gillnet and longline-gillnet are dominant. Among the different gear and vessels operated targeting skipjack tuna, a considerable variation in the trip duration and skipjack tuna landings was observed during the period taken into the consideration.

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