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Importance of Neritic tuna in large pelagic fisheries in Sri Lanka.

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Abstract

This paper presents the trend of neritic tuna fishery in Sri Lanka with an update of the status of resources. In Sri Lanka, neritic tunas were exploited by variety of fishing gears. The main fishing gears used for catching neritic tunas are the ring net and gill net. The fishing seasons and fishing activities are generally associated with the southwest monsoon from (May to September) and the northeast monsoon from November to March. Neritic tuna species are gaining more economic importance in both commercial and local fisheries with higher local consumer demand. Three species of neritic tuna are frequently found in Sri Lankan waters, namely, *Euthynnus affinis* (kawakawa), *Auxis rochei* (bullet tuna) and *Auxis thazard* (frigate tuna). *Scomberomorus commerson* (narrow-barred spanish mackerel) dominates the catch of other species associated with neritic tunas. Annual neritic tuna production in 2012 was 12552.46 Mt in Sri Lankan waters. In 2012, neritic tuna represented 14 percent of the tuna production where frigate tuna contributed higher proportion to the neritic tuna production. However, there is still insufficient information on the distribution and migration of tuna stocks and their biological aspects. In order to develop appropriate tuna management plans at national and regional level more studies are needed.

Key words: fish production, frigate tuna, large pelagic, neritic tuna, sustainability

Introduction

The large pelagic fishery is one of the major fisheries in the country which can be divided into costal, offshore/deep sea (Wijayaratne, 2001). Tuna and tuna-like species are a major component of the large pelagic fisheries in the country. Sri Lanka is one of the oldest and most important tuna fish producing nations in the Indian Ocean (Disanayake et al, 2008). The large pelagic fisheries of Sri Lanka mainly targeting tuna which is an important fishery resource for food and also have valuable percentage contribution of coastal and offshore fishery. Neritic tuna are a major component in coastal fishery. The studies on neritic tuna species started in late nineteen sixties (Maldeniya et al, 1988). They occur in mixed schools showing migratory behaviours (Maldeniya et al, 1988; IOTC, 2010). Three dominant neritic tuna species are often found in Sri Lankan waters namely, *Auxis thazard* (frigate tuna), *Auxis rochei* (bullet tuna) and *Euthynnus affinis* (kawakawa) (Maldeniya et al, 1988; Haputhantri, and Maldeniya, 2011; Haputhantri and Bandaranayake, 2013). Contribution of some other varieties such as oriental bonito (*Sarda orientalis*) and long tail tuna (*Thunnus tonggol*) contribute in quite minute (Maldeniya et al, 1988). This paper highlights the present status of the neritic tuna production and its importance to the large pelagic fisheries in Sri Lanka.

Sources of Information

Data for this study was obtained from the large pelagic fishery data base (PELAGOS) of the National Aquatic Resources Research and Development Agency (NARA). NARA has been maintaining PELAGOS since 1994. Data input for PELAGOS is made through a systematic sampling programme covering all coastal districts; where tuna and tuna like fish are landed.

Neritic tuna fisheries trends in Sri Lankan waters

Sivasubramanium in 1973 estimated that *Auxis thazard* and *A. rochei* contributed 15 percent by weight to the total annual landings in Sri Lanka with frigate tuna and bullet tuna contributing 92% and 8% respectively. Furthermore, Maldeniya in 1988 stated that relative contribution of the neritic tuna which include *A. thazard*, *A. rochei* and *Euthynnus*

affinis were 12.3, 15.8 and 6.1 percent in 1984, 1985 and 1986 respectively. At present their percent contribution has reached 13% and 14% in 2011 and 2012 to the total large pelagic production indicating considerable amount of increment in the fishery. Species contribution has shown that frigate tuna, bullet tuna and kawakawa have contributed 41%, 36% and 23% respectively in 2012 (Figure 1).

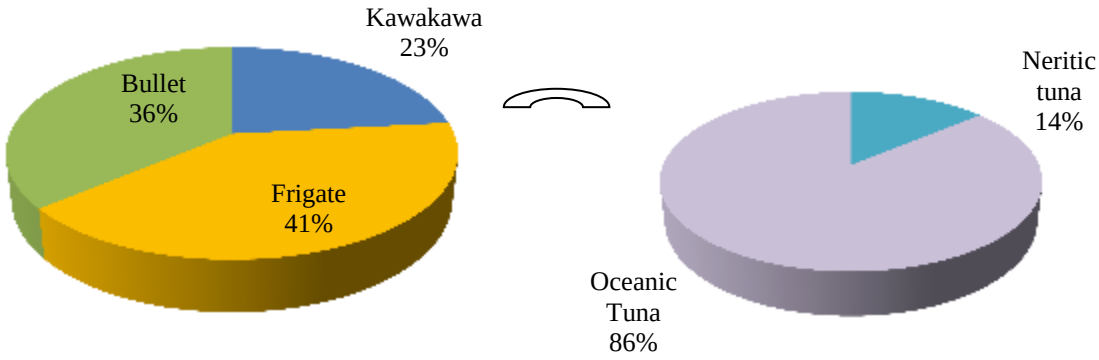

Figure 1: Neritic tuna production by species in 2012 (Source: PELAGOS, 2012)

Coastal and offshore production of neritic tuna

Offshore neritic tuna production contributes 82% to the total neritic tuna production in the country while coastal neritic tuna production contributes 18% (Figure 2).

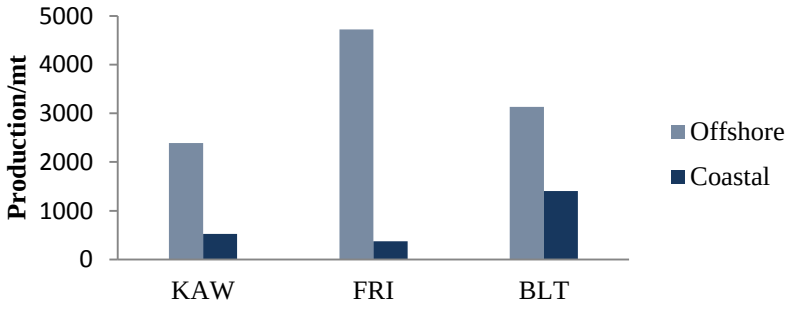

Figure 2: Offshore and coastal neritic tuna by species

Production by fishing zones

The coastline around Sri Lanka has been divided into seven statistical zones: namely, West (Negombo), Southwest (Beruwala, Galle, Dodanduwa), South (Matara, eligama, Mirissa, Dondra, Gandara, Kottegoda), Southeast (Hambantota, Kalametiya, Kirinda, Tangalle, Kudawella), East (Baticaloa, Kalmunai, Malaikadu) and Northeast (Codbay, Trincomalee). Currently, a larger contribution of neritic tuna production in the country comes from the South and South east parts of the country (Figure 3). Both fishing seasons and fishing activities are associated with the two monsoon periods namely, the southwest monsoon from May to September and the northeast monsoon from November to March (Joseph 1999, Dissanayake, 2005). The bulk of the production of bullet tuna comes from the southern part of the country whereas frigate tuna and kawakawa come from the south eastern part of the country. In general, the catches recorded from other zones are limited (Figure 4).

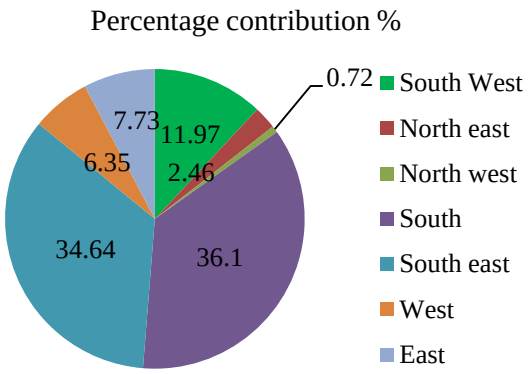

Figure 3: Neritic tuna production by fishing zones in Sri Lanka in 2012 (Source: PELAGOS, 2012)

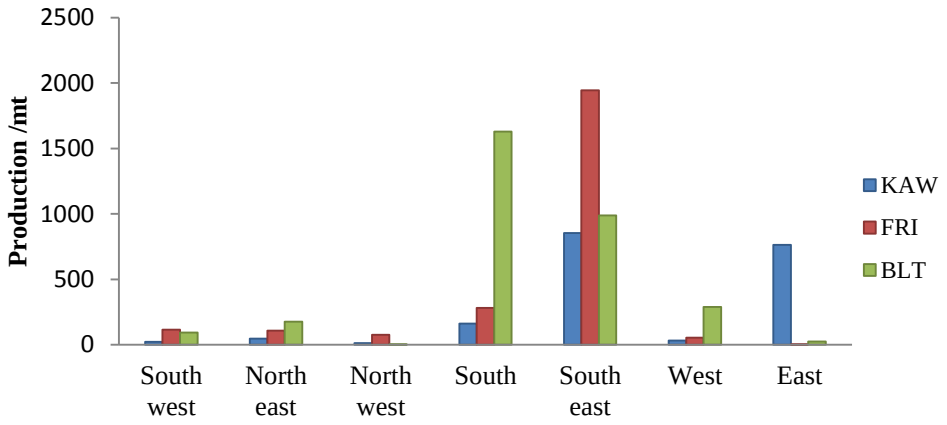

Figure 4: Variation of neritic tuna production by fishing zones

Neritic tuna production by fishing gear

Ring net contributes 61% and 51% respectively for the frigate tuna and bullet tuna production while gill net contributes 54% for kawakawa (Table 1).

Table 1: Neritic tuna production by gear: (RN-Ringnet, LL- Longline, LG- Longline/ Gillnet combination, GN- Gillnet, GT-, Others-handline,pole and line, trolline)
(Source: PELAGOS, 2012)

	GN	RN	LG	LL	GT	Others
Bullet tuna	42.9	**51.0**	1.5	0.3	0.2	4.1
Kawakawa	**54.1**	26.6	6.6	0.2	5.3	7.2
Frigate tuna	27.4	**60.7**	0.3	1.4	4.7	5.5

Size composition

Length frequency analysis in 2012 reveals that, the size range of bullet tuna ranged from 15 cm to 37 cm fork length (FL), where most of the fish ranged from 29-30 cm.The size range of recorded frigate tuna varies from 20 cm to 40 cm FL, but most of the fish varied between 35-37 cm. The fork length of the kawakawa varied between 20-59 cm, where most of the fish were in the range of 40-42 cm (Figure. 5).

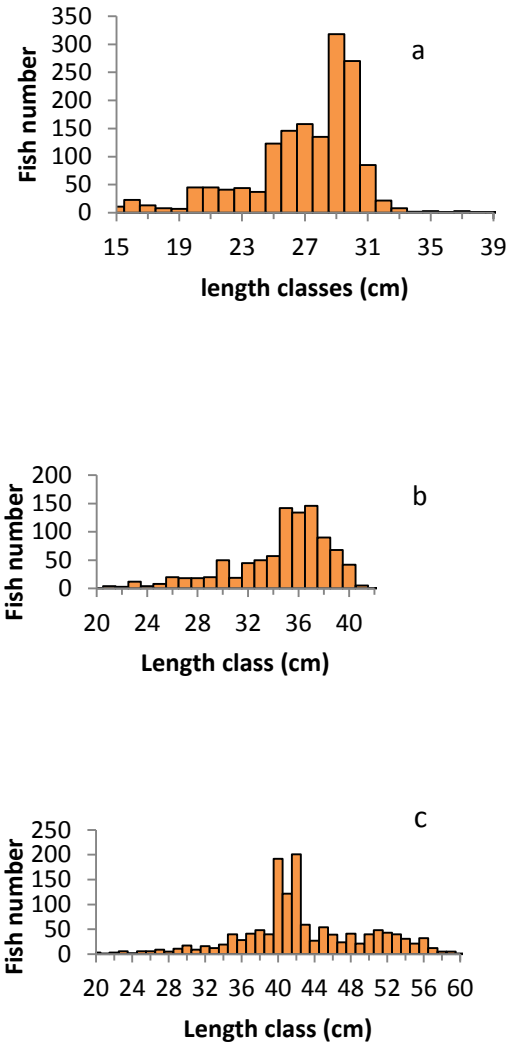

Figure 5: Length frequency distribution of neritic tuna fish landings- 2012 (a) *Auxis thazard* (b) *Auxis rochei* (c) *Euthynnus affinis*

Conclusion

In recent times there has been a clear increase in the neritic tuna production in the country. Since there is no fishery in the Northern area, it may further increase with the provision to develop fisheries activities in the Northern area of the country.

Constrains

Neritic tuna species are gaining more economic importance in both commercial and local fisheries in Sri Lanka. It has a significant effect on employment, livelihood and

economical aspects of the fishery community. However, still there are uncertainties on the distribution and migration of neritic tuna stocks as well as the biological aspects. Lack of information in this regard reveals the need of conducting such studies and thereby developing appropriate tuna management plans at national and regional level in order to ensure sustainability of the resource.

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References

Dissanayake, D.C.T. 2005. Monitoring and assessment of the offshore fishery in Sri Lanka, Fisheries Training Programme, Iceland.

Dissanayake, D.C.T., Samaraweera, E.K.V. and Amarasiri, C. 2008. Fishery and feeding habits of yellowfin tuna (*Thunnus albacares*) targeted by coastal tuna longlining in the north western and north eastern coasts of Sri Lanka, Sri Lanka. J. Aquat. Sci.13:1-21

Haputhantri S.S.K. and Maldeniya R., 2011. A review on billfish fishery resources in Sri Lanka. IOTC–2011–WPB09–28.

Haputhantri, S.S.K. and Bandaranayake, K.H.K. 2013. Analysis of Kawakawa (Euthynnis affinis) landings in Sri Lanka and estimation of the length-weight and length-length relationships. IOTC–2013–WPNT03–34 Rev_1

IOTC, 2010. Report of the thirteenth session of the scientific committee of the IOTC

Joseph, L. 1999. Management of shark fisheries in Sri Lanka. FAO Fisheries Technical paper378/1. FAO: Rome.

Maldeniya, R., Moyiadeen, N.M. and Amarasiri, C. 1988. Present status of the fishery for small tuna species, billfish and seer fish in Sri Lanka, Report of workshop on small tuna, seer fish and bill fish in the Indian Ocean, 24-37

Maldeniya, R. 1998. Tuna research and data collection activities in Sri Lanka. 7th Expert Consultation on Indian Ocean Tunas. [December, 2005]

Sivasubramanium, K. 1973. Co-occurrence and the relative abundance of narrow and broad corseletted frigate mackerels *Auxis thazard* and *A. rochei* around Ceylon, Poceed. Symp. on living resources of the seas around India.

Wijayaratne B., 2001. Coastal fisheries in Sri Lanka: some recommendations for future Management. Final project United Nation University, Reykjavik, Iceland.