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MANAGEMENT OF SHARK FISHERY IN SRI LANKA

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Abstract

The fisheries sector is one of the most important sectors in the economy of Sri Lanka by providing direct and indirect employment to the country. The sector also contributes nearly 3% to the GDP and provides 65-70 % of the animal protein consumed by the population. Fisheries management arrangements within the EEZ were implemented under the provisions of Fisheries and Aquatic Resources Act No.2 of 1996. The objectives of the Act are management, conservation, regulation, and development of the fisheries and aquatic resources of Sri Lanka**.** During the past two decades the fishing activities have been expanded from its continental shelf and beyond 200 mile EEZ. Sharks have been exploited for 4-5 decades using various fishing methods during last decades. However presently deep water shark fisheries are operating in very insignificant levels. Majority of the catch come as by-catch from tuna long line and gill net fishery. It has been observed that Shark catches have been decreased rapidly during last decades as a result of the management arrangements. The catch composition mainly includes silky shark and other twelve species. There is a action plan for preparation of NPOA-Sharks in Sri Lanka and Fisheries Act and other environmentally related legislations take initiatives to the conservation and management the shark fisheries in the country.

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Introduction

Sri Lanka is a coastal fishing nation in the Indian Ocean and has sovereign right over 517,000 km2 of Exclusive Economic Zone declared by 1978(Figure 1). Marine fisheries sector play an important role in tits economy. The fisheries sector contributes around 70% of the animal protein to its population. The total fishery production in 2006 was 215,000 tons which accounts for 84% of the total fish consumed. The annual per capita consumption is 12.8 kg. The marine fisheries sector can be divided into three sub-sectors namely coastal, offshore and high sea for administrative and analytical purposes. Coastal fishery is defined if the fishing activities within the continental shelf area which 22 km in average. Offshore fishing takes place beyond the continental shelf up to the EEZ boundary while high sea fishing takes place in international waters.

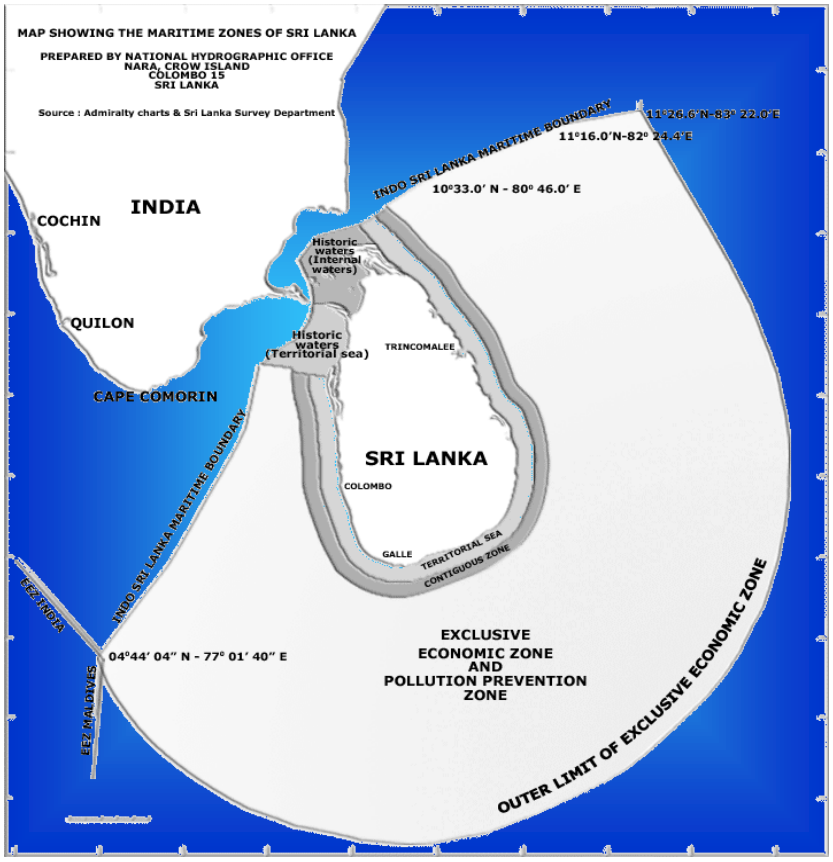

Figure 1: Sri Lanka territory and Exclusive Economic Zone (Survey Department of Sri Lanka, 1988)

Main fishing gears used in offshore and high seas fishery are gillnets and longlines. The longline fishery has developed since mid 1980s. Currently over 3000 active boats are operating in the large pelagic fishery targeting migratory stocks of tuna, billfish and sharks. Longline fishery was the fastest growing sector in the marine fishing industry during the last two decades.

Shark Fishery

The shark fishery production has been increased from 8,665 tons in 1990 to 25,006 tons in 2000, equivalent to 17% of the national fish production. However, a declining trend has been observed during the last decade. Sri Lanka's contribution to the global shark production was 3% during the period 1990-2003 being the world ranking in the 10^{th} position and it was reduced to 2.4% in 2004

Sharks have been exploited by the offshore as well as coastal fisheries in both pelagic and benthic habitats. The main gears involve in Shark fishery are gillnets, shark longlines, however bycatches been recorded in tuna longline fishery. Sharks have traditionally contributed to the marine fish catch in Sri Lanka, but primarily the coastal and bottom living species with localized distributions. Subsequent development and expansion of the bottom trawl fisheries during the 1960s also significantly increased the production of the same sharks. Large-mesh gillnetting and some of the hook and line fisheries also caught small quantities of the coastal pelagic sharks. With the introduction of synthetic gillnets in the late 1950s, large mesh drift netting for large pelagic fish increased and expanded. In late 90s offshore gill net fishery expanded further and contributed 11600 tons in 1990 to 57000 tons in 1996 which was 28% of the total production. In late 80's shark longline fishery was established for offshore pelagic sharks. Presently sharks are being caught by gillnets, shark longline and tuna longline and small scale deep water spiny shark fishery.

Socio-economic aspects

Shark fisheries are always associated with other fisheries and therefore there is no separate socio economic analysis for shark fisheries. Shark fishery and make a significant contribution to the economy in the case of the export of shark-fins and from deepwater benthic sharks. The information on export figures is available in the Sri Lanka Customs. The value of fins is depending on the species, fin type, condition and regional preference.

Shark species available in Sri Lankan landings

Taxonomy of sharks has been relatively neglected by Sri Lankan fish taxonomists, possibly on account of the difficulties inherent in many species, as well as the paucity of specimens. Various authors have from time-to-time attempted to catalogue the Sri Lanka sharks. Mendis (1954) listed 15 species and Munro (1955) upgraded the list to 22. In 1984 De Silva listed 44 confirmed and 11 unconfirmed species in his check list. Several of these unconfirmed species have subsequently been recorded in Sri Lanka waters. Amarasooriya and Dayaratne (1994) listed 44 species from the west and south western coast landings and in 1999 Amarasooriya added 4 more species to the listed. De Silva (IUCN) included a total of 61 species of Sharks belonging to 5 Orders and 17 families as being present in Sri Lankan waters (Appendix 1)., Although 61 have been recorded from Sri Lanka, only about 12 species dominate the landings.

Shark management in Sri Lanka

It is widely known that Sharks generally have low reproduction rate, late maturity and small population size. As a result Sharks are susceptible to overfishing and slow to recover if overfished. Therefore management of Shark/Skate is one of the most important roles and the Department of Fisheries & Aquatic Resources is the sole regulatory body which is mandated to the Department of Fisheries & Aquatic Resources is the regulatory body which is mandated to the management of fisheries & Aquatic Resources of Sri Lanka and Fisheries & Aquatic Resources act no. 2 of 1996 establishes the basic institutional framework required for fisheries management. The Act lays emphasis on management of fisheries and sustainable development with due recognition of conservation measures. Some current regulations enacted under the Fisheries Act provide some protection for Shark/Skate.

Fishing Operation Regulations 1996

This is one of the most important provisions. Licensing of all major fishing Operations are to be brought under a licensing scheme for the first time, effectively limiting entry to otherwise open access fisheries. This regulation clearly stated that no person shall catch, land, transport, sell, buy, receive or have in possession any marine mammals or turtles.

Fish Catch Data Collection Regulation, 2012

As the importance in order to regularize the catch data collection in Sri Lanka a regulation has been made 'Catch Data Collection Regulation 2012 accordingly every person who uses mechanized fishing boat, over the length of 32 feet, registered under the registration of Fishing Boats Regulations, 1980 published in the Gazette Extraordinary No. 109 of October 3, 1980, for fishing in Sri Lanka waters shall maintain the log book issued by the Department of Fisheries and Aquatic Resources. Awareness programmes to be introduced the Log books system have been conducted and follow up activities are being carried out.

Landing of Fish (Species of Shark and Skates) 2001

This is one of the legislation pertaining directly to the shark and shark related fisheries for conservations. This says a license holder may land fish belonging to the species of Shark or Skate, so long as the fins of such species of fish are attached to such fish and also no license holder shall land only the fins which have been removed from any fish belonging to the species of Shark or Skate.

Prohibition of catching Thresher Shark Regulations 2012

According to this regulation no person shall catch Thresher Shark species of the family *Alopiidae* (which has three species as *Alopius vulpinus, Alopius superciliosus, A. pelagicus*) when engage in any fishing operation, recreational or sport fishing.

About 80 regulations have already being Gazetted under the Department of Fisheries and Aquatic Resources Act - concerning registration of fishing boats, export of live fish, fish landings, gear regulations for inland fisheries, declaration of special management areas etc.

The Fauna and Flora protection Act of Sri Lanka is being amended and it is proposed to include Whale shark as protected species. Whale shark is being listed under Appendix II of Convention of Migratory Species (CMS) and CITES.

Department of Fisheries & Aquatic Resources introduce new technology for the exploitation of fishery resources in national & international waters in a sustainable manner and also impose new regulation in line with the regional and international laws & Conventions.

National Plan of Action for Sharks

Even though Sri Lanka do not targeting for Shark, as a member of the UN FAO, Sri Lanka is committed to producing its own NPOA for conservation and management of Sharks and therefore Sri Lanka has taken initiatives to prepare NPOA–Shark.

Other management arrangements

Department of Fisheries and Aquatic Resources undertakes educational initiatives, public awareness on matters relating to the conservation of Sharks. In most of the activities the feedback from the from the stake holders is significant. With all these management activities, it was observed that the shark catches have been decreased from 13,290 in 2010 to 10,620 in 2011 (Figure 2).

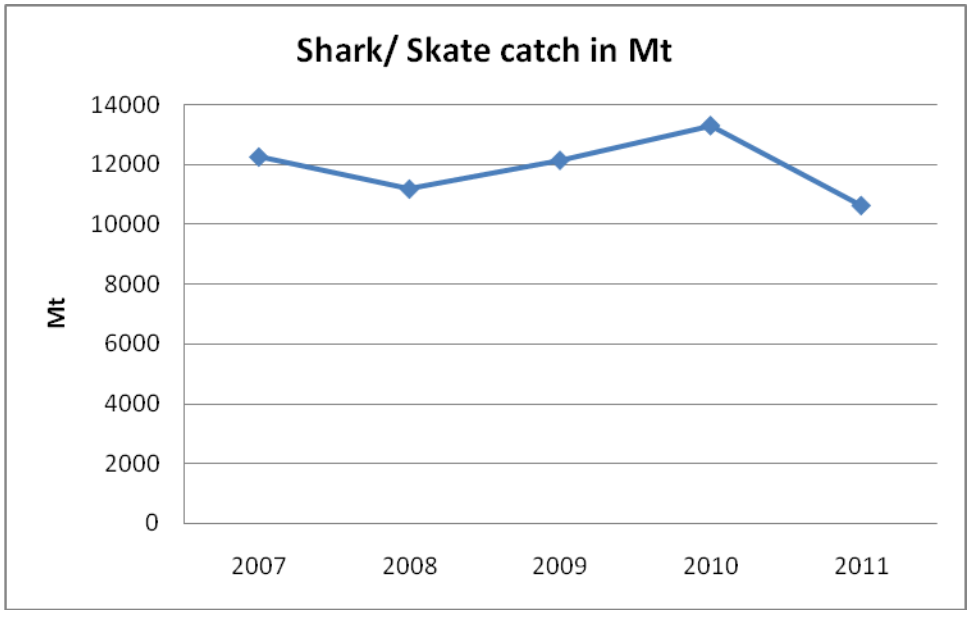

Figure 2**: Shark/ Skate catch in sri lanka from 2007 to 2011**

Source : Statistics Unit/MFARD

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Appendix 1. Checklist of Shark species recorded from the territorial waters of Sri Lanka

ORDER HEXANCHIFORMES

FAMILY HEXANCHIDAE

1. *Hexanchus griseus* (Bonaterre, 1788).B I untynose sixgill sharks.

2. *Notorynchus cepedianus*(Peron,1907).Broadnose sevengill shark.

ORDER SQUALIFORMES

FAMILY EHINORHINIDAE

3. *Echinus brucus*(Bonaterre,1788).Bramble shark.

Family SQUALIUDE

4. *Centrophorous squamosus*(Bonaterre,1788)Leaf scale gulper shark.

5. *Centros cyllium ornatum*(Alcock,1889). Ornate dogfish.

6. *Dalatias licha*(Bonnatyerra,1788). Kitefin shark.

ORDER ORECTOLOBIFORMES

FAMILY HEMISCYLLIDAE

7. *Chiloscyllium griseum*(Muller&Henle,!838).Grey bamboo shark.

8. *C. indicum* (Gmelin, 1789).Slender bamboo sharks.

9. *C. plagiousum* (Bennet, 1830). Whitespotted bamboo sharks.

FAMILY STEGOSTOMATISDAE

10. *Stegostoma fasciatum*(Hermann,1783).Zebra sharks.

FAMILY GINGLYMOSTOMATIDAE

12. *Rhiniodon typus* (Smith,1828).Whale sharks.

ORDER LAMNIFORMES

FAMILY ALOPIDAE

13. *Alopias vulpinus*(Bonnaterre,1788).Thresher sharks.

14. *A. super ciluiosus*(Lowe,1839). Bigeye Thresher Sharks.

15. *A.pelagicus*(N AKAMURA,1935).PELAGIC THRESHER SHARKIS.

FAMILY ODONTASPIDIDAE

16. *Odontaspis noronhai* (Maul,1955). Bigeye sand tiger.

17. *O.ferox*(RISSO,1810).Smalltooth sandtiger.

18. *Eugomphodus taurus* (Rafinesque,1810). Sand tiger Sharks.

FAMILY PSEUDOCARCHARIIDAE

19. *Pseudocarcharias kamoharai* (Matsubara, 1936).Crocodile Shark

FAMILY LAMNIDAE

20. *Carcharias carcharias*(linnaecu, 1758).Great white shark

21. *Isurus oxyrinchu*(Rafinesque,1809). Shortfin mako Sharks.

22. *I. paucus* (Guitart Manday,1966). Longfin mako

ORDER CARCHARHINIFORMES

FAMILY SCYLIORHINIDAE

23. *Atelomycterus marmoratus* (Bennet, 1830).Coral catshark.

24. *Halaelurus hispidus* (Alcock, 1891).Bristly catshark.

FAMILY PROSCYLLIIDAE

25. *Eridacnis radcliffei* (Smith,1913) Pygmy ribbontail catshark.

FAMILY TRIAKIDAE

26. *Mustelus manazo* (Bleeker,1854).Starspotted smoothhound.

27. *M.mosis* (Hemprich & Ehrenberg,1899).Arabian Smoothhound.

FAMILY HEMIGALEIDAE

28. *Chaenogaleus macrostorna*(Bleeker,1852). Hooktooth Shark.

29, *Hemigaleus microctorna* (Bleeker,1852). Sicklefin weasel shark.

30.Hemipristis elongatus(klunzinger,1871).Snaggletooth shark.

FAMILY CARCHARHINIDAE

31. *Carcharhinus albimarginatus*(Ruppel,1837).Silvertip shark.

32. *C.altimus* (Spriger,1950).Bignose shark

33. *C.amblyrhynchoides*(Whitley, 1934).Gracefull shark.

34. *C.amblyrhynos* (Bleeker,1856).Grey reef shark.

35. *C.amboinensis* (Muller& Henle,1839).Pigeye shark.

36. C.brevipinna (Muller& Henle,1839). Spinner Shark

37. *C. dussumieri* (Valenceiennes,1839).Whitecheekl shark.

38. *C. falciformis*(Bibron,1839).Silky shark.

39. *C.hemiodon* (Valenciennes,1839)Pondicherry shark.

40. *C.limbatus* (Valenciennes,1839).Blacktip shark.

41. *C. longimanus*(Poey.1861).Oceanicwhitetip shark.

42. *C. macloti* (Muller&Henle,1839).Hardnose.shark.

43. *C.melanopterus*(Quoy&Gaimard,1824).Blacktip reefshark.

44. *C.plumbeus*(Nardo,1827).Sandbar shark.

45. *C.sealei*(Pietschmann,1916).Blackspot shark.

46. C. sorrah (Valenciennes.1830).Spot-tail shark.

47. *C.wheeleri*(Garrick,1982).Blacktail reef shark.
48. *Galeocerdo cuvier* (peron& Lesuer,1822).Tiger shark
49. *lamiopsis temmincki*(Muller&Henlei.1839).Broadfin shark.
50. *loxodon macrorhinus*(Muller&Henlei.1839).Sliteye shark
51. *Nagaprion acutidens*(Ruppell,1837).Sicklefin lemon shark
52. N.brevirostris(Poey.1868).lemon shark
53. *Prionace glauca*(Linnaeues,1758).Blue shark
54. *Rhizoprionodon acutus*(Ruppell,1837)Milk shark
55. *R.oligolinx*(Springer.1964) . Grey sharpnose shark
56. *Scoliodon laticaudus*(Muller&Henlle,1838). Spadenose shark
57. *Triaenodon obesus*(Ruppell,1837).Whitetip reef shark

FAMILY SPHYRNIDAE

58. *Eusphyra blochii* (Cuvier.1817)Winghead.
59. *Sphyrna lewini*(Griffith&Smith,1834).Scalloped hammerhead.
60. *S.mokarran*(Ruppell.1837).Great hamerhead.
61. *S. zygaena*(Linnaeus.1757).Smooth hammerhead.