

A REVIEW NOTE ON DEPLETING FISH STOCK – UNICORN COD IN INDIA*¹Kaviarasu, D., ²Sudhan, C., ³Bharathi, S. and ⁴Vinoth, S¹Department of Fish Pathology and Health Management, School of Aquaculture, Fisheries College and Research Institute, Tamil Nadu Fisheries University, Thoothukudi, Tamil Nadu, India.²Department of Fisheries Biology and Resource Management, School of Fisheries Resource and Environment Management, Fisheries College and Research Institute, Tamil Nadu Fisheries University, Thoothukudi, Tamil Nadu, India.³Third year, Undergraduate Student, Fisheries College and Research Institute, Tamil Nadu Fisheries University, Thoothukudi, Tamil Nadu, India.⁴Second Year, Undergraduate Student, Fisheries College and Research Institute, Tamil Nadu Fisheries University, Thoothukudi, Tamil Nadu, India.

Abstract: This present review paper emphasize the note on depleting fishery resources confined to Indian waters and their status pertaining to *Bregmaceros maclellandi* Thompson, 1840 commonly known as unicorn cod / codlet. Based on the annual marine capture production, the fish stock was found to be one of the major depleting stocks of India. It acts as single fish species stock under the family Bregmacerotidae that confined to Gujarat and Maharashtra states of Indian waters. Due to overfishing or poor management practices, codlet fishery was declining in recent years. By this review, some suggestions and recommendations have been made for the enhancement of unicorn cod fisheries by the united activities of fishers, stakeholders and scientific communities

Key Words: Single fish species, Codlet, Overfishing, Stakeholders and Scientific communities.

1. INTRODUCTION:

India has been one among the top 10 fish producing countries of the world since 1960 with its position oscillating between the third and the seventh rank. The marine fish production of India reached a record of 3.7 million tons in 2014-15 owing to mechanization of the crafts, motorization of the country crafts, commencement of stay over fishing at deeper areas, improvements in gear and related infrastructure facilities which were introduced at different periods since the late 1950s. Almost 90% of the production was obtained from within 70m depth covering an estimated area of about 100,000km². The marine fisheries resources were mainly constituted by the pelagic finfishes (all those fishes which live most part of their life in the surface or subsurface waters) numbering about dozen major groups and species, the demersal finfishes (those fishes which live most part of their life on bottom or sub column layers), crustaceans groups, cuttlefishes and squids (ICAR, 2011). The world fisheries and aquaculture production and utilization shows that, the marine production of the world has been increased from 90.2 million tons in 2009 to 93.4 million tons in 2014 with increase in per capita fish food supply and consumption has been increased from 18.1 kg in 2009 to 20.1 kg in 2014 and 123.8 million tons to 146.3 million tons in 2014 respectively. India stands seventh position in top ten fish producing countries pertaining to marine capture fisheries with an average of 3 085 311 tons for the year 2003 to 2012; 3 418 821 tons for the year 2013 and 2014 without any variation for the year 2013 and 2014 respectively (FAO, 2016). This paper would contribute the reasons for depletion of Fishery of unicorn cod is mainly confined to Gujarat and Maharashtra state and supported by single species, *Bregmaceros maclellandi* which is also known as spotted codlet and also suggest some of the conservatory measures and management tools based on the cited literatures and research publications that were specially contributed for this particular fishery to sustain the capture of unicorn cod in a sustainable way that the species would be available in ocean for future generations.

1.1. SYSTEMATIC POSITION OF UNICORN COD:

Kingdom: Animalia

Phylum: Chordata

Class: Actinopterygii

Order: Gadiformes

Family: Bregmacerotidae

Genus: *Bregmaceros*

Species: *B. mccllellandi*

Binomial name: *Bregmaceros mccllellandi* Thompson, 1840

Common Name: Unicorn cod

1.2. ENVIRONMENTAL RANGE:

This species belongs to Marine; brackish; pelagic-oceanic; Oceanodromous (Migrating nature within ocean itself); depth range 0 - 2000 m. Subtropical; 40°N - 30°S (Riede, 2004; Weitkamp and Sullivan, 2003).

1.3. BIOLOGY OF UNICORN COD WITH MERISTICS CHARACTERISTICS:

Dorsal spines (total): 0; Dorsal soft rays (total): 57-66; Anal spines: 0; Anal soft rays: 58 - 69; Vertebrae: 52 - 58. Body is elongate, brownish and with speckling above and silvery below. The cheek and lower head also silver. The fish has single occipital ray long and delicate, extending to near the middle of the second dorsal fin. Pelvic fins were jugular (Houde, 1984). Maximum recorded length was found to be 9.6 cm SL male/unsexed; common length: 7.0 cm SL male/unsexed (Cohen, 1990 and Bianchi, 1985). It has its occurrence both onshore in brackish water and oceanic. According to larval survey, occurrence in the tropics was found to be wide. Feed on planktonic crustaceans. This fishes were also caught with the help of bag nets (Okiyama, 1993; Link and Garrison, 2002). The diagrammatic representation of the unicorn cod species was illustrated in Figure – 01 for basic understanding of the morphological characteristics of the representative fish.

1.4. FISHERY STATUS OF CODLET:

According to the International Union for Conservation of Nature and Natural Resources (IUCN) and Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) this species *Bregmaceros mccllellandi* Thompson, 1840 was predicted to fall in the category named as Not evaluated.

1.5. DISTRIBUTION PATTERN:

It was found to be different countries, seas, oceans, bays and gulf regions. The world wide occurrence reported to be in Arabian sea, Bay of Bengal, Canary Current, Cape Verde, East China Sea, Gulf of Thailand, Indian ocean, Indonesian Sea, North Australian Shelf, Red Sea, Samar Sea and South China Sea as native species. FAO (Food and Agriculture Organization) areas found to be Western Indian Ocean and Eastern Indian Ocean was 30° E - 80° E; 45° S - 30° N and 77°E - 150°E; 55°S - 24°N respectively. The world wide occurrence and distribution of this species was illustrated in Figure – 02.

(Occurrence of *Bregmaceros mccllellandi* Thompson, 1840, Sourced from: <http://www.fishbase.org/Country/CountryList.php?ID=8421&GenusName=Bregmaceros&SpeciesName=mccllellandi>)

1.6. FOOD & FEEDING HABIT:

The food items found to be zoobenthos (ostracods) and zooplankton (other planktonic invertebrates and crustaceans) by gut content analysis.

1.7. PREDATOR:

The major predator of this fish was found to be Sciaenid species like *Johnius dussumieri*, *Otolithes cuvieri* and *Pennahia anea* based on the literature source.

2. MATERIALS AND METHODS:

Annual unicorn cod Landings (In tons) had been collected from Central Marine Fisheries Research Institute (CMFRI) annual reports from 1950 to 2014. The total annual production of codlets landings were calculated and interpreted by using simple column chart using Microsoft Excel (Fig.1– 6).

3. RESULTS AND DISCUSSION:

TRENDS IN PRODUCTION:

For the year 1950 – 1959, the highest landings observed in 1953, 14566 tons and the lowest landings in 1957, 1138 tons (Graph – 01). For the year 1960 – 1969, the highest landings observed in 1960, 6096 tons and the lowest landings in 1969, 1684 tons (Graph – 02). For the year 1970 – 1979, the highest landings observed in 1972, 5488 tons and the lowest landings in 1977, 30 tons (Graph – 03). For the year 1980 – 1989, the highest landings observed in 1984, 2650 tons and the lowest landings in 1982, 69 tons (Graph – 04). For the year 1990 – 1999, the highest landings observed in 1991, 1492 tons and the lowest landings in 1995, 139 tons (Graph – 05). For the year 2000 – 2014, the highest landings observed in 2012, 1081 tons and the lowest landings in 2010, 341 tons (Graph – 06). In order to regulate, certain measures have to be taken with strict implementation measures for the protection of this single stock fishery.

4. REMEDIES:

1. Establishing or extending property rights over the sea, although this would be difficult to implement
2. Imposing a special conservation tax on fishing. However, the effectiveness of such a tax would depend upon the elasticity of demand for fish
3. Fishing Ban period establishment and increasing the number of days of fishing holidays.
4. Limit size of nets and mesh size regulation
5. Controlling number of fishermen and fishing days
6. Providing the current status, future prediction and estimation of fish stocks
7. Better information for fishermen on the current size of fish stocks
8. Conservation of fish stocks
9. Creation of a single and organized market for fish, and an external fisheries policy regarding other countries
10. Reducing demand will lead to a replenishing of fish stocks, but supply can also be targeted directly, such as by giving subsidies to fishers

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FIGURE – 01: DIAGRAMMATIC REPRESENTATION OF UNICORN COD

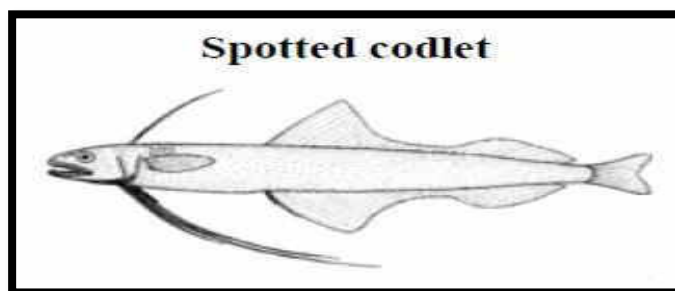
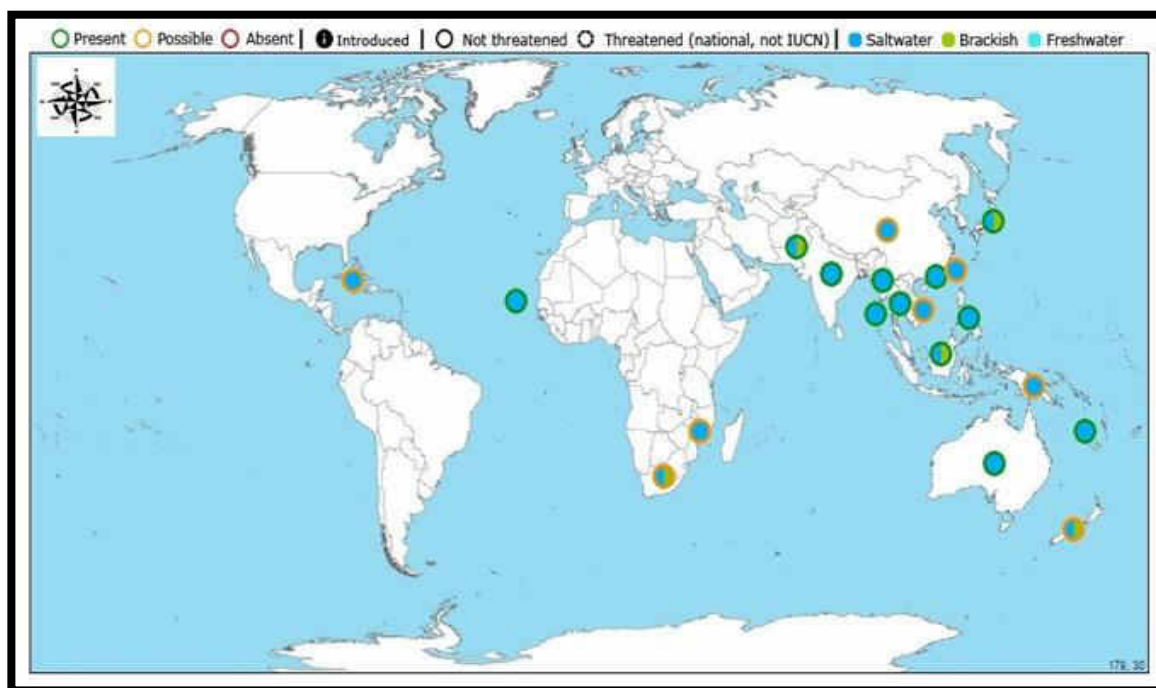
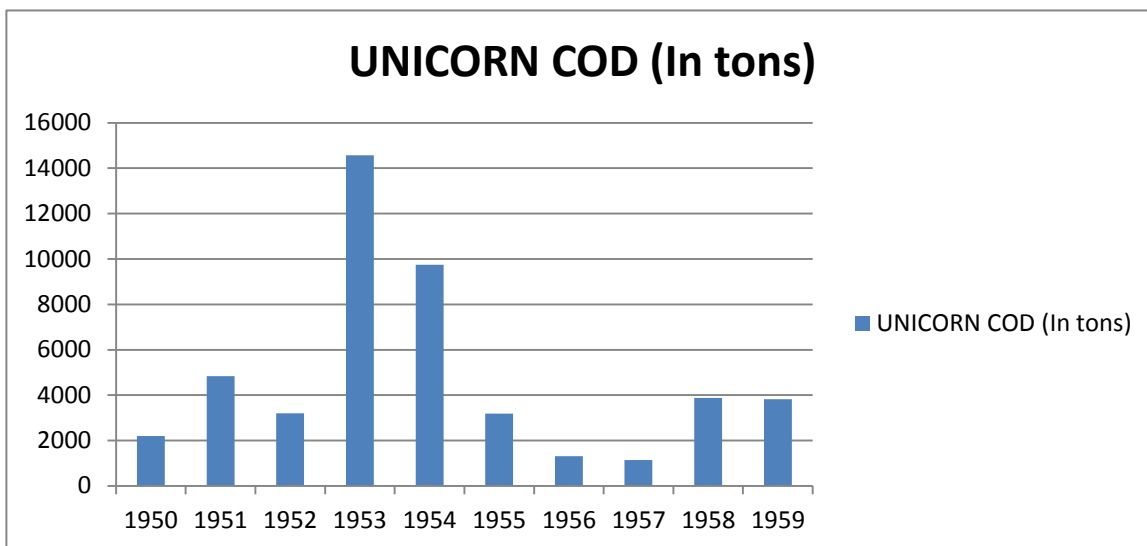


FIGURE – 02: Occurrence of *Bregmaceros maclellandi* Thompson, 1840

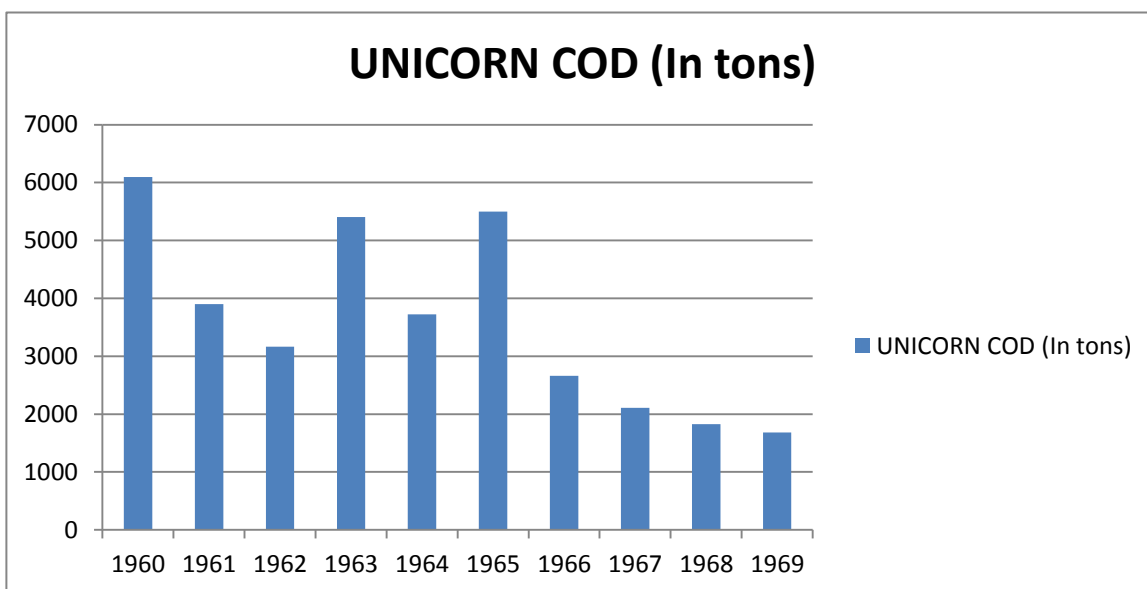


SOURCE: <http://www.fishbase.org/Country/CountryList.php?ID=8421&GenusName=Bregmaceros&SpeciesName=maclellandi>

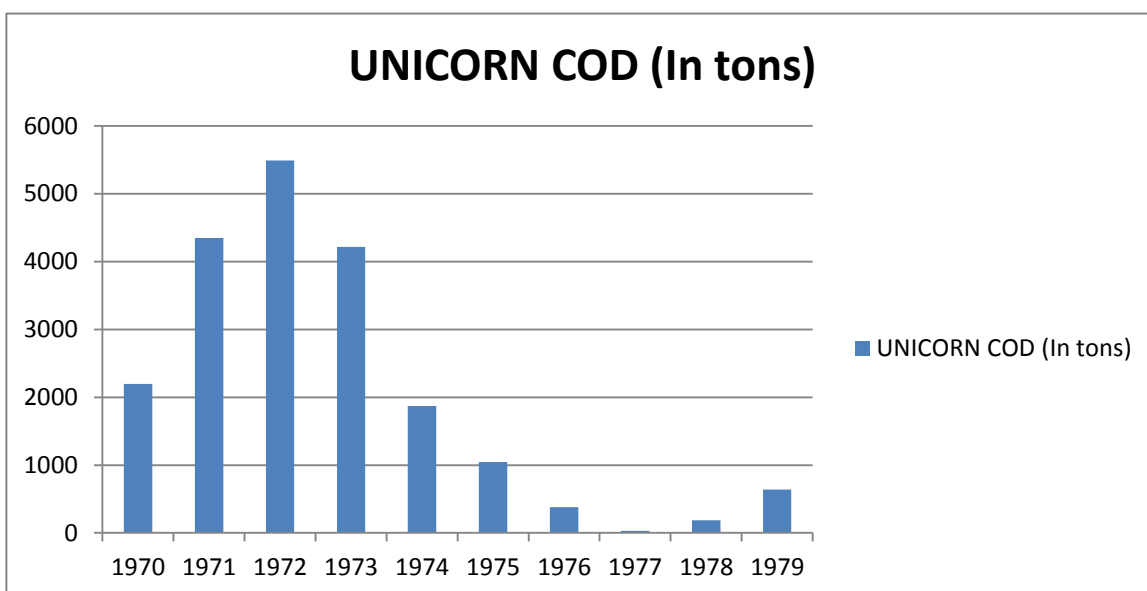
Graph 1: Total Annual Unicorn cod Landings in India 1950 – 1959



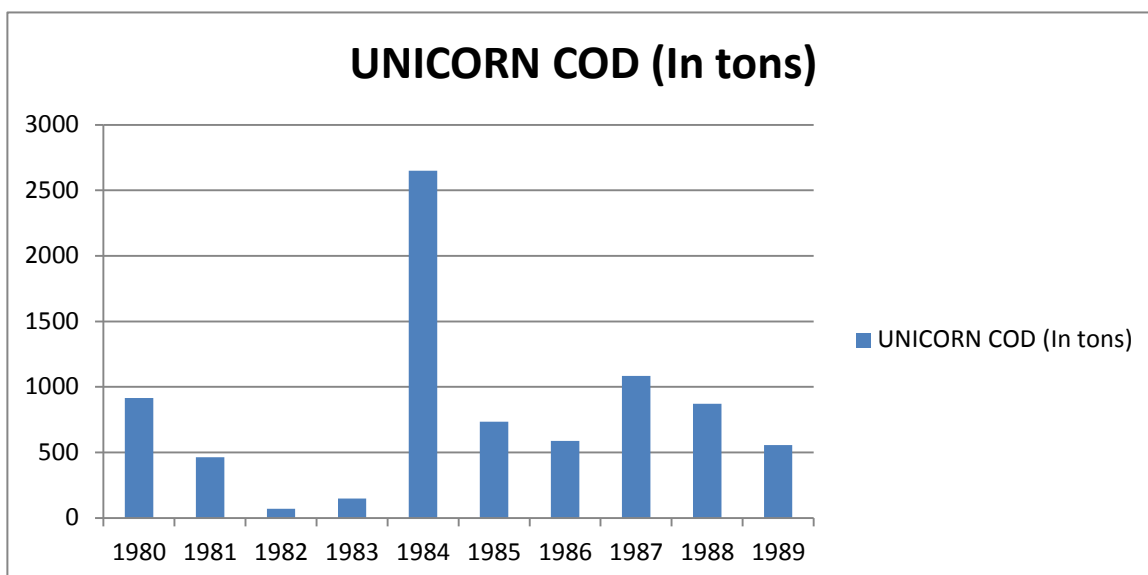
Graph 2: Total Annual Unicorn cod Landings in India 1960 – 1969



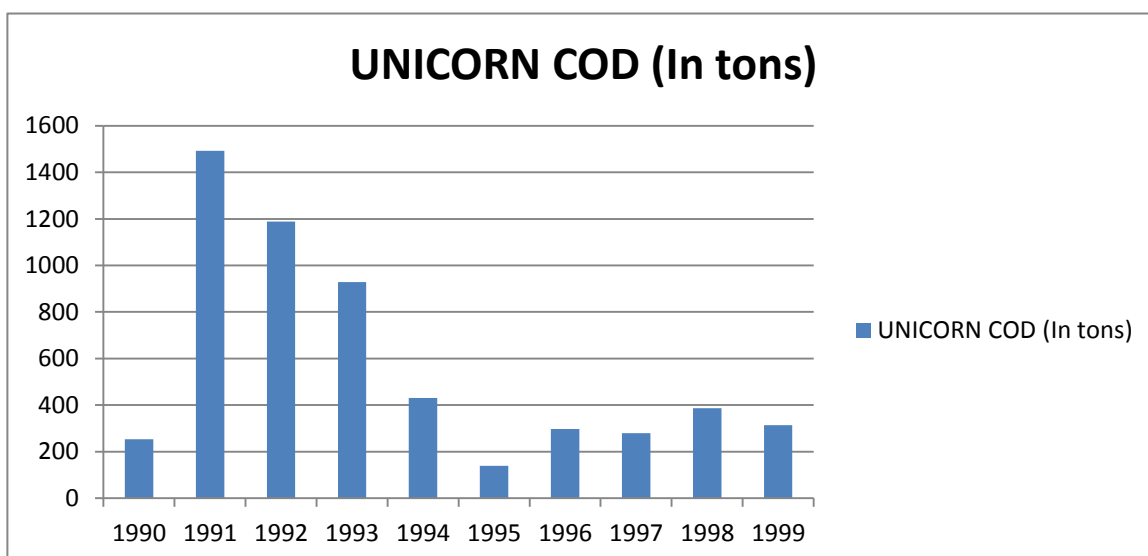
Graph 3: Total Annual Unicorn cod Landings in India 1970 – 1979



Graph 4: Total Annual Unicorn cod Landings in India 1980 – 1989



Graph 5: Total Annual Unicorn cod Landings in India 1990 – 1999



Graph 6: Total Annual Unicorn cod Landings in India 2000 – 2014

