

Bycatch and Discards-Issues and Solution

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SUMMARY

By catch is a major problem in the marine environment and is a key challenge for fishery managers worldwide. The FAO estimated that around one quarter of the total world catch of fish is discarded and that about 17% of catch in the U.S. commercial fisheries is bycatch. Trawl fishery in India have shown that incidental catches/low value bycatch (LVB) landing and utilization has increased over the period of time. An estimated 200,000 loggerhead (*C. caretta*) and 50,000 leatherback (*Dermochelys coriacea*) sea turtles are taken annually as bycatch in pelagic longlines. Around 650,000 whales, dolphins and seals and 100 million sharks are still caught and killed each year around the world due to bycatch, illegal fishing and the persistent demand for shark fins.

INTRODUCTION

Bycatch is catch that is either unused or unmanaged where unused catch is that which is not used for consumption, sold for any purpose, or reused by the fisher as bait. It includes discards (that portion of the catch that is thrown overboard) and wasted catch after landing that is neither sold nor directly consumed. Unmanaged refers to catch, whether categorised as individual species or groups of different species, that does not have specific management to ensure the take is sustainable. Discards (or discarded catch) were defined as being “that portion of the catch which is returned to the sea” for whatever reason. Both target catch and bycatch may be discarded. Discards are pernicious as they may represent a waste of edible fish. Moreover, discarded organisms are virtually never reported in the absence of observers, which results in a distortion of data used in stock assessment.

By catch and Discards – A Global Problem

Global total capture fishery production in 2014 was 93.4 million tonnes, of which 81.5 million tonnes from marine waters and 11.9 million tonnes from inland waters. For marine fisheries production, China remained the major producer followed by Indonesia, the United States of America and the Russian Federation. Based on FAO's analysis of assessed commercial fish stocks, the share of fish stocks within biologically sustainable levels decreased from 90 percent in 1974 to 68.6 percent in 2013. Thus, 31.4 percent of fish stocks were estimated as fished at a biologically unsustainable level and therefore overfished. Of the total number of stocks assessed in 2013, fully fished stocks accounted for 58.1 percent and under fished stocks 10.5 percent. The under fished stocks decreased almost continuously from 1974 to 2013, but the fully fished stocks decreased from 1974 to 1989, and then increased to 58.1 percent in 2013. FAO has previously commissioned two global assessments of fisheries bycatch and discards. The first study (1994) provided a yearly mean global estimate of 27 million tonnes of discards. A decade later, an update estimated global average yearly discards at 7.3 million tonnes. The FAO (1999) estimated that around one quarter of the total world catch of fish is discarded and that about 17% of catch in the U.S. commercial fisheries is by catch (NOAA, 2005).

By catch and discards - Indian scenario

A study of India's marine fisheries in the early 1990s found that the bulk of marine landings in all of its maritime states consisted of juvenile fish due to the use of extremely small cod-end mesh size (as low as 8–10 mm only one-fourth of the 35 mm size that is legally required). Trawl fisheries sector account more than 50% of the marine fisheries production of India. Annual average fish landing from trawlers was 17, 21, 000 t (2008–2011), which formed around 51 % of the marine fish landing of the coast. In this about 51% of the catch was contributed by the west coast and remaining by the east coast of India. Recent studies of the trawl fishery in India have shown that incidental catches/low value bycatch (LVB) landing and utilization has increased over the period of time. The estimated landing of low value bycatch (LVB) in trawl fisheries, increased from 14 % in 2008 to 25 % in 2011, which is reflected as reduction in discard volume by trawlers. On an average the highest quantity of LVB landed was in Veraval (50,000 t) and in Mangalore, LVB landing increased from 3% in (3000 t) in 2008 to 26 % (12,000 t) in 2011. In Mumbai, the percentage of trash fish landed remained around 5% during the study period. In Calicut, the LVB landed in 2011 contributed 26% to the total landings by the trawl. In Kochi, Kerala

the total LVB landed in 2011 was 1,992 t forming 7.2 % of the total landing. In Chennai, Tamil Nadu, the LVB landing which was 13 % in 2008 increased to 17% in 2011, while in Visakhapatnam, Andhra Pradesh, LVB landing showed a steady increase from 2% in 2008 to 21% in 2011.

Global discards by gear wise

Trawl fisheries for shrimp and demersal finfish account for over 50 percent of total estimated discards while representing approximately 22 percent of total landings. Tropical shrimp trawl fisheries have the highest discard rate and account for over 27 percent of total estimated discards. Demersal finfish trawls account for 36 percent of the estimated global discards. Crustaceans find a prominent place in the low value trawl bycatch that is usually landed in a state of decomposition and fetches only very low price. About 53% of the crustaceans in the bycatch are crabs, followed by stomatopods (23%) and shrimps (18%) at Chennai fishery harbour. The Bay of Bengal Programme study indicated that the quantity of bycatch discarded by the east coast trawlers was 100,000–130,000 lakh tonnes during the year 1988.. Gulf shrimp trawls catch some 10 million to 20 million juvenile red snapper each year more than 70 percent of each new year-class.

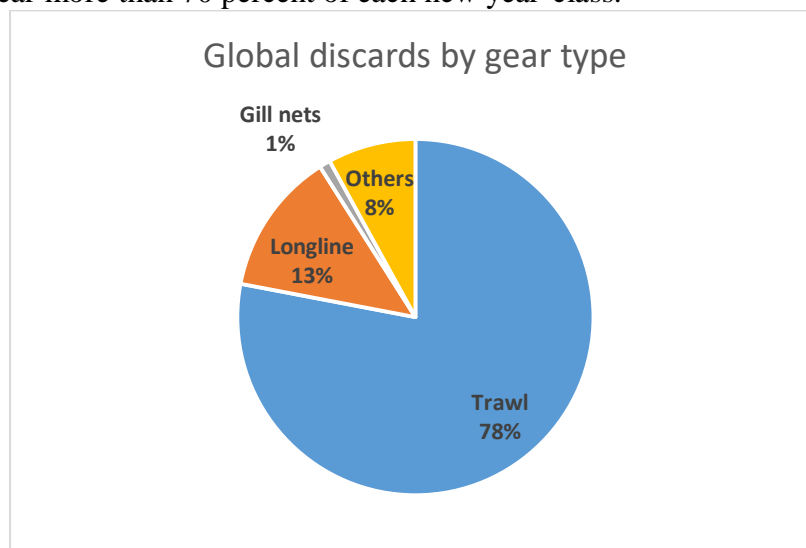


Fig.1 Global discards by fishing gear wise

Bycatch in longline fisheries

Discard rates (in tonnes) by different gear types, average discard rates for tuna and highly migratory species from longlines (28.5 percent) were found to be second only to shrimp trawls (62.3 percent), but when examined individually some longlines had lower discard rates than some forms of pots, dredges and gill (or drift) nets. Long liners routinely discard tunas which are too small for the sashimi market (high grading). Indian Ocean longline fisheries have far higher levels of bycatch than pole-and-line or purse seine fisheries. Bycatch consists of 87 species or species groups, including sharks, seabirds and turtles, many of which are listed by IUCN as being threatened or endangered. Bait used for long line fishing however amounted to 11.6% of the tuna catch and should be considered as discards. An estimated 200,000 loggerhead (*C. caretta*) and 50,000 leatherback (*Dermochelys coriacea*) sea turtles are taken annually as by catch in pelagic long lines.

Table: 1 IOTC 2012 tuna main fishery catches in tonnes (excluding cetaceans, seabirds and sea turtles)

Fishery	Total catch	Target catch	Sharks	Bycatch (reported)	Bycatch (unreported)	Discards (incl. bait)	Landed bycatch
Drift gillnet	65000		1100	5006	---	---	---
Oceanic longline	237,44	228,5	35,0	32,66	15,358	60,358	32,662
Purse seine (oceanic)	240,40	238,1	1,00	2,27	6,263	negligible	8,534
Purse seine (coastal)	114,35	114,3	----	43	-----	negligible	43
Pole-and-line	86,21	86,2	negligible	2,13	-----	10,000	2,137

Total	1,328,409	665,0	146,016	87,178	21,621	70,358	43,376
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By catch in gill net fisheries

Many marine mammals and seabirds have been caught and estimated to have been caught in cod gillnet fisheries around Newfoundland. Entanglement of pinnipeds appears also relatively common and several cases of leatherback entanglement in bottom-set gillnets have been reported in Newfoundland and Labrador waters. Bottom-set gillnets for instance have incidental impacts on marine mammals and harbour porpoises caught annually in Newfoundland. The valuable bycatch from trammel net was 19.85 % (4.53 kg) and 21.62% (2.37 kg) along the coast of Thoothukudi proper and Thoothukudi south respectively. There was no valuable bycatch found along coast of Thoothukudi north. The discardable bycatch from trammel net was 34.06% (1.24 kg), 76.29% (17.41kg) and 67.37% (7.40 Kg) along Thoothukudi north, Thoothukudi proper and Thoothukudi south coast respectively. Researchers recently estimated that as many as 100 million sharks are still caught and killed each year around the world due to by catch, illegal fishing and the persistent demand for shark fins.

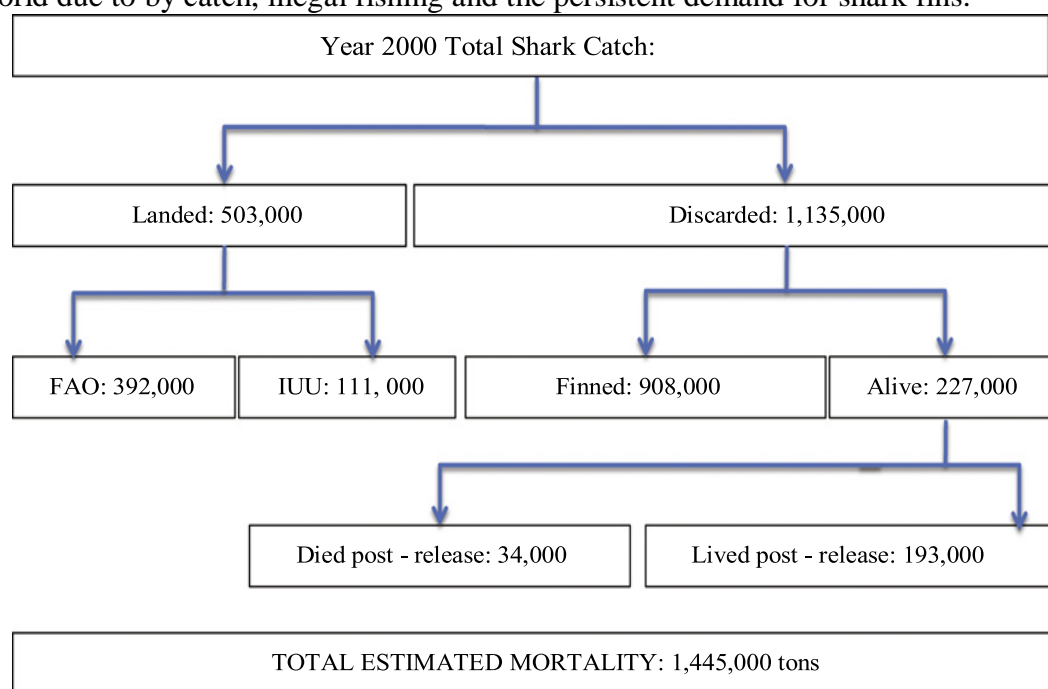


Fig.2. Estimating global shark mortality for the year 2000.

By catch Reduction Devices (BRDs)

Bycatch Reduction Devices (BRDs) is defined as any device that can be incorporated in a fishing gear in order to exclude or reduce non targeted and unwanted catch in a fishing system and thereby making it more selective. The code of conduct for responsible fisheries gives guidelines for sustainable development of fisheries, stresses the need for developing selective fishing gears in order to conserve resources, protect non targeted resources and endangered species like sea turtles. Accordingly, the incorporation of such devices in fishing gears will help to

- Reduce the negative impact of trawling to the sea bottom
- Reduce sorting time on board the vessel and
- Reduce towing resistance while dragging the net (better fuel efficiency)

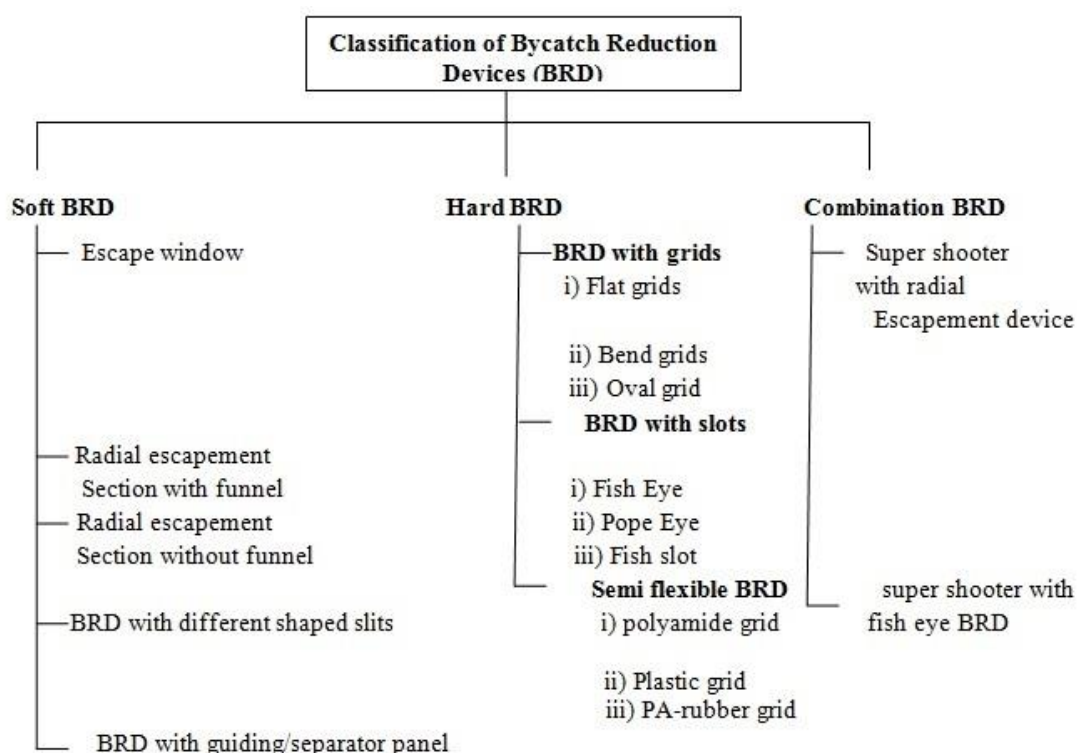


Fig. 3 Different types of Bycatch Reduction Devices (BRD)

CONCLUSION

In recent decades, the Fishery and Agriculture Organization of the United Nations (FAO) has provided a range of legislative instruments and guidelines for fisheries, including the 1995 Code of Conduct for Responsible Fisheries, the 1999 FAO International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries (IPOA Seabirds, FAO, 1999), the 1999 FAO International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks, FAO 1999), and the 2009 FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations (FAO, 2009). These guidelines are intended to assist States and Regional Fisheries Management Organisations or Arrangements (RFMO/As) in the management of bycatch and reduction of discards in conformity with the FAO Code of Conduct for Responsible Fisheries. Among other initiatives, these Guidelines establish that States and RFMO/As should develop a framework for long-term cooperative work on bycatch management and discard reduction in association with stakeholders, management authorities at all levels, and other agencies and organizations, including providing accurate and timely information on bycatch-related issues, regulations and activities. Even gear modifications intended to reduce incidental capture are not without flaws. Modifications designed to increase gear selectivity (e.g., larger net mesh, bycatch reduction devices) result in organisms escaping through gear rather than providing a means of avoiding the gear altogether.

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