1OCEAN programme: Citizen Science

Monitoring Shark landings at Shakthikulangara Harbour

Introduction

Sharks are apex predators that play a pivotal role in maintaining the balance of marine ecosystems. Their presence regulates prey populations and ensures the health of coral reefs and seagrass beds (Heithaus et al. 2008). However, in recent decades, the global shark population has been declining due to overfishing, habitat degradation, and bycatch in commercial fisheries (Dulvy et al. 2014).

The Indian coastline, particularly Kerala, is a hotspot of elasmobranch diversity, yet it faces increasing pressure from mechanized fishing fleets (CMFRI 2024). Shakthikulangara, a prominent fishing harbour in Kollam district, serves as a critical landing site for a variety of marine species, including sharks. This internship was undertaken to monitor shark landings at this harbour, with a focus on identifying species diversity, fishing practices, and post-harvest utilization. The study aimed to document the frequency and nature of shark bycatch, record the fishing gear used, and understand the socio-economic pathways through which shark products are distributed.

Methodology

The shark monitoring internship was conducted over a series of field visits to the Shakthikulangara fishing harbour from 7–24 May 2025. During this short-term study period, systematic observation was conducted on six early mornings with data collected during peak landing hours typically between 06:00 AM and 08:50 AM, coinciding with the return of mechanized fishing vessels. Each survey session lasted between 1 to 2 hours. Data collection involved direct observation and informal interviews with fishers and traders. The primary variables recorded included the species name (where identifiable), type of

Table 1. Shark species landed at Shakthikulangara fishing harbour during study period

#	Name of the species	Number of individuals during study period	Catch type	Gear type	Fishing boat type	Uses
1	*Iago omanensis*	24	Bycatch	Small mesh size	Mechanized	Fertilizer, feed industry
2	*Iago mangalorensis*	7	Bycatch	Small mesh size	Mechanized	Fertilizer, feed industry
3	*Eridacnis radcliffei*	6	Bycatch	Small mesh size	Mechanized	Fertilizer, feed industry
4	*Halaelurus quagga*	1	Bycatch	Small mesh size	Mechanized	Fish meal
5	*Chilloscyllium arabicum*	1	Main catch	Small mesh size	Mechanized	Meat
6	*Heptranchias perlo*	1	Bycatch	Small mesh size	Mechanized	Meat, fish oil
7	*Echinorhinus brucus*		Bycatch	Small mesh size	Mechanized	Meat, fish oil

catch (main catch or bycatch), time of landing, fishing duration, gear type, mesh size, fishing depth, and distance from shore. Additional data on the number of individuals, their intended use (meat, oil, fertilizer, fish meal), price per kilogram, and market destination (local, export, industry) were also noted. Photographic documentation was attempted where possible, though weather conditions and handling practices limited image clarity on some days. The photographs were identified to species to genus level by Vishnu H. a PhD student from University of Kerala.

Observation

1. ***Iago omanensis Bigeye Houndshark***
   A small shark species is often caught as bycatch. It's found in deep waters and typically targeted by mechanized boats using small mesh gear. Used mainly in fertilizer and feed production.
2. ***Iago mangalorensis Mangalore Houndshark***
   Closely related to I. omanensis, this species shares similar habitats and capture methods. It's valued for its role in the low-cost industrial feed and fertilizer sectors.
3. ***Eridacnis radcliffei Pigmy Ribbontail Catshark***
   A slender deep-sea shark, rare in catch records. Its small size and low market value make it a common bycatch, used chiefly in feed and fertilizer.
4. ***Halaelurus quagga Quagga catshark***
   Identified by its striped pattern, this species is infrequently caught and primarily processed into fish meal. It inhabits soft-bottom marine areas.
5. ***Chiloscyllium arabicum Arabian Carpetshark***
   Also known as the Arabian bamboo shark, it's a demersal species targeted for meat. It's usually caught as part of the main haul and is prized in niche food markets.
6. ***Heptranchias perlo Sharpnose Sevengillshark***
   Commonly called the Sharpnose Sevengill shark, this deepwater predator is used for meat and fish oil. It's notable for its unique seven-gill anatomy.
7. ***Echinorhinus brucus Bramble shark***
   The bramble shark is a rare deep-sea species with thorny skin. Caught as bycatch, it's processed for both meat and oil, though its rough texture limits its appearance.

Discussion

The observations glimpses pattern of shark bycatch across multiple fishing days. Seven shark species with over 55 individuals were recorded from over six survey days. The number of individuals recorded does not reflect the actual landings as only a few crates were sampled each day (Table 1). Although sharks are not the primary target species, their frequent occurrence as bycatch poses a threat to population stability. The economic incentives for meat and oil extraction are limited to a few species, while the majority are relegated to low-value uses such as fertilizer and fish meal. The findings from this internship highlight the prevailing shark bycatch issue at Shakthikulangara, and the need to act on it. The lack of species-level identification and data recording at landing sites hampers conservation planning. Training programs for fishers and harbour staff, along with the introduction of species identification cards and mobile apps, could bridge this gap. Moreover,

Eridacnis radcliffei

Heptranchias perlo

Halaelurus quagga

Ehinorhinus brucus

Chilloscyllium arabicum

Iago omanensis

Iago mangalorensis

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a—*Torpedo panthera ray* | b—Dipturus sp. (longnose skate) | c—guitar fish | d—Chimera (Neoharriota pinnata) | e—Remora *(Echeneis naurcrates* | f—Cephalopods | g—puffer fish | h—shrimp

policy interventions such as bycatch quotas, gear restrictions, and seasonal closures may help reduce shark mortality. Collaboration with research institutions and NGOs can further support data collection and awareness campaigns. Ultimately, balancing economic livelihoods with ecological sustainability will be key to ensuring the long-term survival of shark populations along the Kerala coast.

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