Under the sea with Trisha Gupta

Trisha Gupta, a marine conservationist was always fascinated by the oceans from a very young age. Although she grew up in Bangalore far away from the coast, she was captivated by the sea. This inclination led her to complete her graduation in Zoology from Christ College and post-graduation in Marine Biodiversity and Conservation from International Master of Science in Marine Biodiversity and Conservation (EMBC). She is currently pursuing her PhD from University of Oxford where she is studying an interesting species in terms of having the best of both the sharks and rays which is the guitar fish and its behaviour. The RHATC team 2022¬–23 got the opportunity to meet the conservationist on 16 November 2022.

She started her presentation by asking us about how we picture sharks. Most of the responses were aggressive, large fish, cruel but none of them were true. We were stunned to learn more about these often feared, often misunderstood creatures of the deep. This misinterpreted creature along with rays belongs to a group named elasmobranchs who have slow growth, late maturity, low fecundity and her susceptible to fishing pressure and there are more than 1,150 diverse species of elasmobranchs globally. Trisha Gupta's internship at Dakshin Foundation and her work on the fisheries in Sindhudurg, a coastal district in south of Maharashtra that also hosts the main fishing centre in the region named Malvan exposed her to the real world of conservation which does not only mean saving the marine organisms but also about the lives of the coastal communities interacting with and dependent upon the ocean. This motivated her to study further on the reliance of fishing communities on catch, methods of fishing and marine ecosystems. She also touched upon the fact that while India has imposed a ban on shark fin trade and protected ten species (Pondicherry Shark, Ganges Shark, Green sawfish, Narrow sawfish, Porcupine ray, Speartooth shark, Whale Shark, Largetooth shark, Giant guitarfish, and Ganges sting ray) under the Wildlife Protection Act, 1972 these regulations are hampered by limited capacity for mortality and enforcement.

In the year 2018, the proposed framework for mitigation of fisheries bycatch in the paper "Translating the terrestrial mitigation hierarchy to marine mega fauna bycatch" helped her prepare a risk-based mitigation hierarchy framework for elasmobranch capture. The mitigation hierarchy is a framework for preventing and compensating for the negative impacts of development projects on biodiversity. The mitigation hierarchy prepared was used to critically assess a range of hypothetical measures for reducing elasmobranch capture in a trawler fishery on India's west coast. The trawler landing surveys were conducted over a period of two years where the captured sharks and rays were mostly smaller in size as they were composed of small-sized coastal species and juveniles of larger species like hammerheads. Challenges of gathering morphological data of the species as they

were laid out for sale and walking around with measuring tapes which led to a popular joke among communities that whether she was going to stitch a dress for the dead shark did not demotivate her from continuing her work. The assessments ultimately led to the development of the mitigation hierarchy framework as a tool for bycatch management. There were four steps in the mitigation hierarchy. They were avoidance, minimization, remediation and offset. Out of the all four mitigation strategies the management measure under offset was not feasible to be applied in the present content. The management measure under the other three steps of mitigation hierarchy were spatio-temporal closures for avoidance; net restrictions for minimizations; bycatch reduction devices; and live on board release for remediation. According to her feasibility assessment on board release may be one of the viable for fish species, as it would have moderate chances of survival and with minimal impact on earnings. While closures, net restrictions and Bycatch reduction devices may reduce elasmobranch capture, implementation will be challenging under present circumstances due to the potentially high impact on fisher income.

Her presentation which also included data from Dulvy et al., 2021 educated us about a global extinction crisis that we might have overlooked. In 2014 the first global assessment of species for Class Chondrichthyes that includes sharks, rays and chimeras concluded that one-quarter (24%) of species were threatened. However, in 2021, 32.6% species in the Class Chondrichthyes were threatened with extinction. It has been concluded that overfishing driven by human consumption is a key threat for these elasmobranch species and one third of the species are at the risk of extinction. Moreover, according to a report by WWF, it was estimated that between 2012 and 2019 US$2.6 billion of shark and ray meat was traded globally.

The presentation also touched on the bottlenecks in carrying out fieldwork as a woman. She explained how she intended to conduct surveys by on boarding fishing vessels to record precise catch locations and environmental data of the study species. However, she faced considerable challenges in conducting these studies as the fishermen were not comfortable taking women on board their vessels. She also explained the importance of participation and inclusion of the fishing community in conservation and management of the fisheries. Her team did that by developing an outreach book on sharks and rays of Malvan, in the local language Marathi. The book contained information regarding the importance of sharks and rays in local ecosystems. It also disseminates the findings of their study regarding species diversity, biology, and breeding of elasmobranchs.

The major takeaways from her session would be the importance of working with all stakeholders for a cause. In this case, with fishing communities, locals, non- government organizations, fisheries department and also the restaurant owners selling the meat of the sharks. Along with that it is also important to acknowledge challenges, have an open mindset, interdisciplinary skills and communication.

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