

CHAPTER 7

CONCLUSION AND

RECOMMENDATION

7.1 Conclusion

Advancements in Marine Biodiversity Research: The studies highlight significant advancements in the taxonomy, molecular phylogeny, and innovative identification technologies such as the YOLO a deep learning model. These methods have notably improved the accuracy and efficiency of species identification, which is crucial for effective conservation management. DNA barcoding, in particular, has been instrumental in clarifying species boundaries and uncovering cryptic species, enhancing both scientific understanding and conservation efforts.

Population Dynamics and Conservation Needs: Detailed analysis of the population dynamics of key species like *Carcharhinus falciformis*, the silky shark, has provided vital data on growth patterns, mortality rates, and exploitation levels. Findings indicate that the exploitation rate slightly exceeds the optimal threshold, suggesting potential overexploitation and underscoring the need for well-regulated fishing practices. The seasonal variation in biodiversity, with peaks during spring and declines in summer, further emphasizes the need for seasonal management strategies to align with natural life cycles and recruitment patterns.

Post-Harvest Utilization: The study also delves into post-harvest practices, where traditional uses of elasmobranch products like shark liver oil are noted alongside economic challenges linked to declines in elasmobranchs populations. The utilization of elasmobranch byproducts, such as the production of shark liver oil for boat varnishing and the conversion of low-quality fish into fish meal for aquaculture, highlights adaptive strategies to maximize resource use and support local economies. These practices demonstrate the potential for creating additional revenue streams while ensuring minimal waste, reflecting broader trends in fisheries aiming to maximize the value of all catches.

Cultural and Economic Contexts: Research conducted among fishermen and traders in Gujarat's coastal regions reveals a deep-seated cultural connection to fishing, passed down through generations, which sustains the local fishing economy. However, this tradition faces challenges such as declining profitability due to decreased shark and ray populations and changing environmental conditions. The community's high level of regulatory awareness is promising for compliance with conservation measures, though

CONCLUSION AND RECOMMENDATIONS

ongoing education is necessary to address misconceptions and enhance the effectiveness of these measures.

Integrated Management Approaches: The integration of ecological data, traditional knowledge, and regulatory frameworks is essential for developing adaptive management strategies that address both the ecological and economic realities of the fishing industry. These strategies should focus on sustainable fishing practices, protection of biodiversity, and the support of local livelihoods. Continual refinement of identification technologies and expansion of datasets are critical for maintaining the relevance and effectiveness of these tools in conservation efforts.

Overall, the combined research efforts provide a robust foundation for informed conservation strategies and sustainable fisheries management. By continuing to integrate cutting-edge technologies with comprehensive demographic and ecological studies, marine conservation can effectively contribute to the sustainability and protection of marine biodiversity, ensuring that elasmobranch populations, as well as other marine life, thrive for future generations. This holistic approach will help maintain the health and productivity of marine ecosystems, particularly in biodiversity-rich areas like Gujarat, fostering a sustainable balance between human activity and natural marine processes.

7.2 Recommendation

- Given the taxonomic uncertainties identified in the current survey, additional taxonomic clarification is needed to determine the validity of certain obtained specimens. There is a pressing want for comprehensive taxonomic investigations and further research on the taxonomy, diversity, and distribution of Elasmobranchs fauna in the maritime zone of Gujarat state, India.
- The promotion of advance techniques, such as Object detection analysis using Deep learning, is recommended due to its usefulness in species identification and monitoring.
- There is a significant deficiency of biological data in the region. Future research should focus on examining further biological information for the species, as this can greatly assist in conservation efforts and the development of effective management plans.
- Conducting study on behaviour, ecology, and tagging of migratory species can be promoted to enhance our understanding of the characteristics of this group of species.
- Regular intervals of exploratory surveys should be done to comprehend the dynamics of fish population and to monitor the health of the environment and ecology.
- In order to maintain correct records of the catch, it is necessary for all fishing vessels to utilize log sheets for each day of fishing. Additionally, the crew must be properly taught to ensure precise collection of data regarding the fishing effort and catch. The fishermen should be given a comprehensive list of endangered species and be encouraged to release them back into the water alive. In return for their efforts, they would get rewards.
- An evaluation of the socio-economic conditions of fisher-folk is necessary, and efforts should be made to enhance their essential requirements and amenities.
- The conservation endeavour cannot achieve success without the active participation of fishermen, stakeholders, and Traders. Hence, it is necessary to organize awareness campaigns among them, highlighting the susceptibility of elasmobranchs to fishing pressure and the need for responsible utilization of this resource. Furthermore, it is imperative to ensure that individuals are equipped with knowledge pertaining to the proper identification and species-specific

CONCLUSION AND RECOMMENDATIONS

capture information of sharks and batoids, as well as the implementation of appropriate management strategies, applicable legal provisions, penalties for non-compliance with rules and regulations, and their significance within the marine ecosystem.

- Elasmobranchs typically have life history features that are defined by slow growth, prolonged lifespan, and low reproductive capacity. Hence, it is necessary to carefully strategize the commercial utilization of this resource, with a strong focus on effective management and conservation.
- Collaboration between universities, research institutions, and NGOs at both the national and international levels is essential to facilitate exploration and acquire fundamental knowledge from the region.