Indian Marine Fish Life Histories (INMARLH) database for determining resilience and vulnerability of tropical marine species

Click to download the data DATA

Date 2021-07-31

Author(s) Mohamed Kolliyil[1], Sathianandan Thayyil[1], Vivekanandan Elayaperumal[1], Kuriakose Somy[1], Ganga Upendra[1], Pillai Lakshmi[1], Nair Rekha[1]

Affiliation(s) 1 : ICAR - Central Marine Fisheries Research Institute (CMFRI), PO Box 1603, Kochi, Kerala State, India

DOI 10.17882/82124

Publisher SEANOE

Keyword(s) Tropical fisheries, data-deficient fisheries, life-history traits, effects of fishing, high-risk species, Ecosystem Based Fisheries Management, Fish Stock Assessment

Abstract Taking advantage of published data on life-history traits and short-term information on fishery parameters from 3132 records for 644 fish stocks along the coast of India, we calculated resilience (R) and vulnerability (V). Further, we developed an Index of Resilience and Vulnerability (IRV) for 133 species of tropical finfishes, crustaceans, and molluscs. Using 7 resilience and 6 vulnerability attributes, two-dimensional scatter plots of the resilience and vulnerability scores were generated and the Euclidean distance and angle from the origin to each point were calculated to determine IRV and the effect of fishing on fish species. By ranking the species, the top 10 highly resilient, highly vulnerable, and high-risk species (low IRV) were identified. While small-sized species with fast growth rate and low trophic level were among the highly resilient species, large predatory species such as sharks and barracudas were among the highly vulnerable and high-risk species. More than 100 of the 133 species were resilient-yet-vulnerable, and most crustaceans showed high resilience. Differences in IRV scores among species within the same family were discernible, indicating the differences in the biological characteristics and response to fishing. Sensitivity analysis indicated that an abridged IRV with 6 attributes works similar to 13 attributes and can be used in data-deficient situations. Comparison of R and V of IRV with other assessments showed different results because of divergences in the objectives, number and types of attributes, and thresholds used. These assessments do not convey the same information and therefore great care must be taken for reproducing these frameworks to other fisheries. The results of IRV analysis can be useful for stock assessments and in developing effective management measures in combination with other complementary information.

Data

File	Size	Format	Processing	Access
Database on life history parameters of Indian marine fish stocks	221 KB	XLS, XLSX	Processed data	Open access

Download metadata
TXT, RIS, XLS, RTF, BIBTEX

References

Mohamed Kolliyil S., Sathianandan Thayyil Valappil, Vivekanandan Elayaperumal, Kuriakose Somy, Ganga U., Pillai Saraswathy Lakshmi, Nair Rekha J., Moland Even (2021). Application of biological and fisheries attributes to assess the vulnerability and resilience of tropical marine fish species. PLOS ONE, 16(8), e0255879-.

Top of the page

How to cite

Mohamed Kolliyil, Sathianandan Thayyil, Vivekanandan Elayaperumal, Kuriakose Somy, Ganga Upendra, Pillai Lakshmi, Nair Rekha (2021). **Indian Marine Fish Life Histories (INMARLH) database for determining resilience and vulnerability of tropical marine species**. SEANOE. https://doi.org/10.17882/82124

In addition to properly cite this dataset, it would be appreciated that the following work(s) be cited too, when using this dataset in a publication :

Mohamed Kolliyil S., Sathianandan Thayyil Valappil, Vivekanandan Elayaperumal, Kuriakose Somy, Ganga U., Pillai Saraswathy Lakshmi, Nair Rekha J., Moland Even (2021). **Application of biological and fisheries attributes to assess the vulnerability and resilience of tropical marine fish species**. *PLOS ONE*, 16(8), e0255879-. https://doi.org/10.1371/journal.pone.0255879