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The FUTURE of PICES: Science for Sustainability in 2030

Comprehensive evaluation of tropical reef fishes and habitats using geographic information system and length-based evaluation approach in data-poor situation in Mauritius



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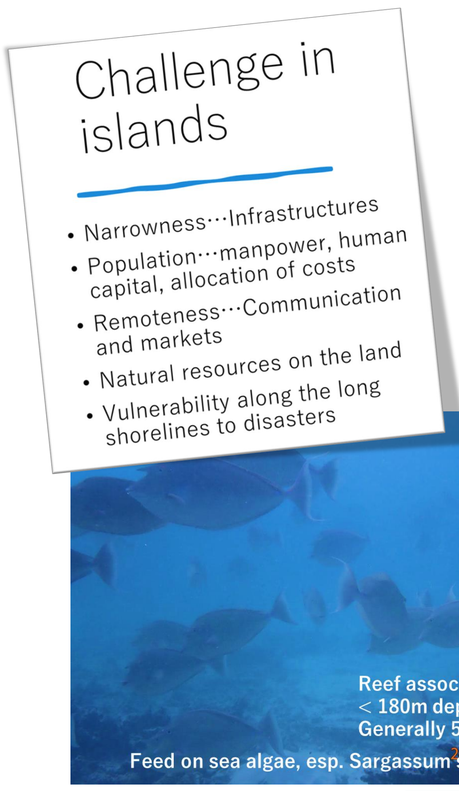
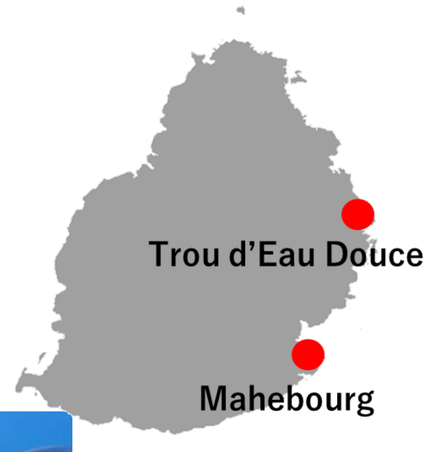
For sustainable fisheries, it is necessary to conduct investigations from multiple perspectives, such as resources, fishings, and habitat ecosystems. On the other hand, comprehensive investigation with them requires significant resources and efforts. Practical empirical information, such as local ecological knowledges (LEK), may be convenience, and reliable scientific surveys should be applied with them but with low cost. In Mauritius, a variety of management efforts based on "blue economy" concept has been implemented with limited resources, but comprehensive investigations and developing measures with integrative information has been challenged in the reality in island country. In this study, size information of key species from both ecological and economic importance, such as Naso unicornis and Epinephelus merra, and their habitat and information of associated other key species are collected by field surveys then analyzed with local fishers in the workshops. Habitat information corrected with LEK were organized as a spatial database using geographic information system (GIS), and parameters of the size-based models were collected by focus group discussions and field experiments with fishers. Models including with combinations of obtained parameters were used for estimations of spawning potentials. Habitat quality indices were spatially and geo-statistically compared to the present marine protection efforts including fishing reserves. Application of LEK improved our analyses. Present degradation of coral bed and potential fishing mortality could result in collapse of local fisheries and livelihood of coastal fishing communities. Improvement of zoning designs and proper measures with information collection by participation of local fishers are necessary for Mauritian coastal sustainability.

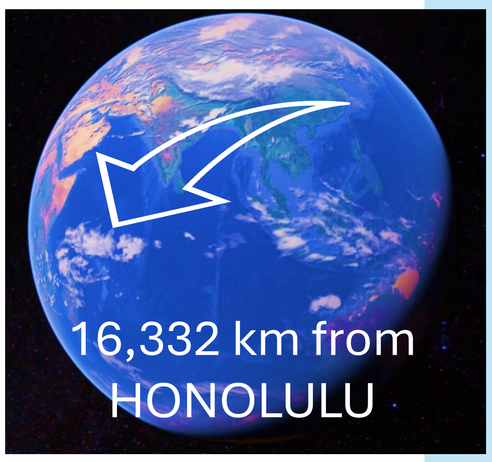
BACKGROUND

Island countries often faces challenges for adequate scientific monitoring and management for conservation of marine ecosystem while sustainably utilizing the marine resources.

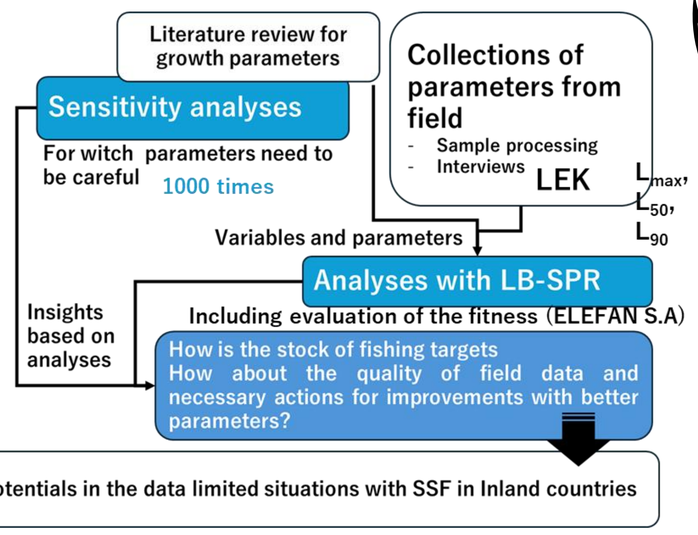
In Mauritius, conservation efforts of coastal ecosystem has been made with BLUE ECONOMY concept. However, those efforts are still not sufficient from limitation of data and information due to those challenges.







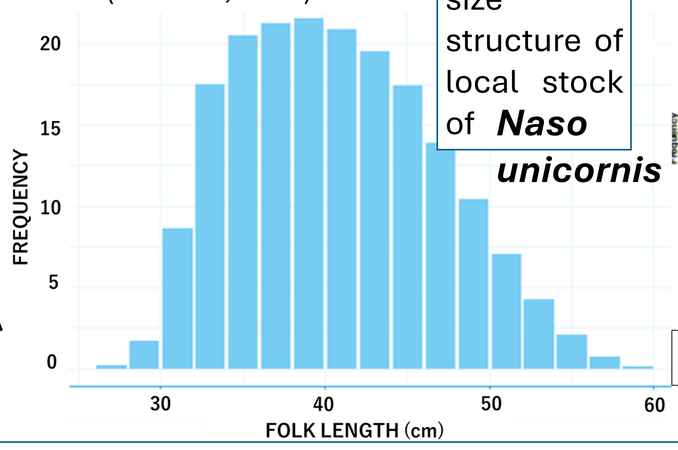
METHODS

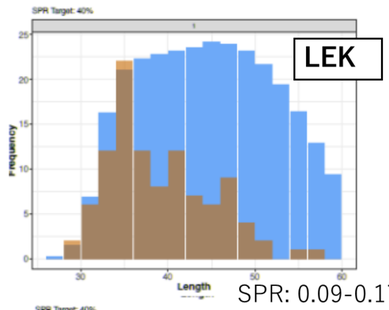


Integrating collected size information as photos and parameters from interviews: focus group and unstructured individual interviews

Naso unicornis (Forsskål, 1775)

Potential size structure of local stock of ***Naso unicornis***





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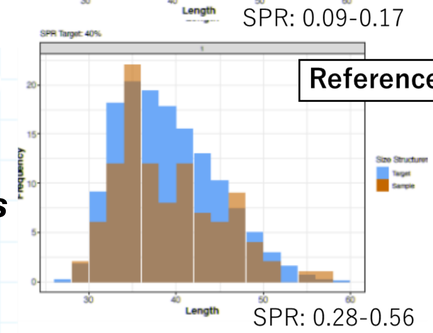

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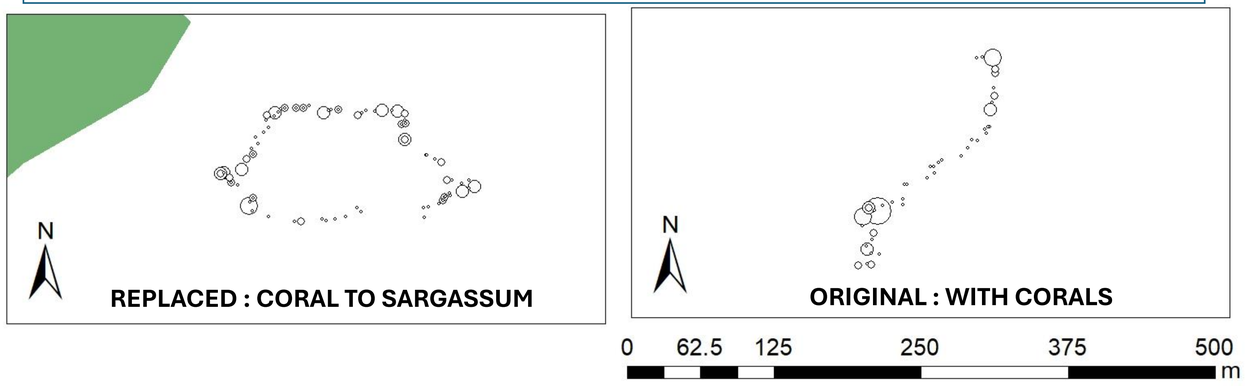
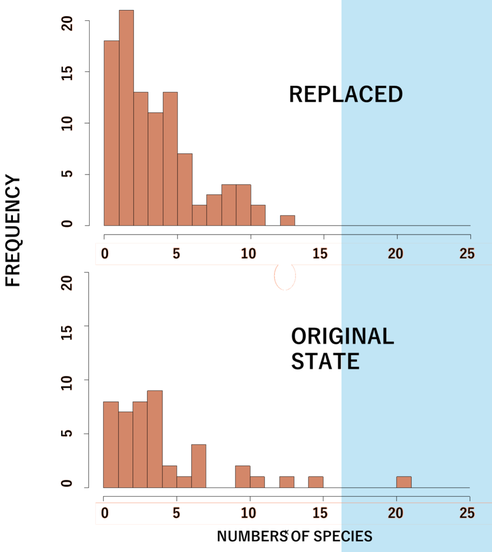
COMBINATION

Synthesized LEK based visual-census information with visualization

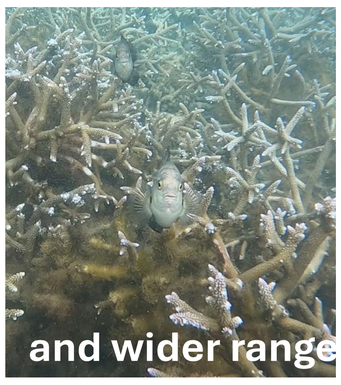




RESULTS

Combination of available references and in-situ information from LEK provided prediction...But still high variabilities in the sensitivity analyses = need *n*

EXPECTATION




With participations and visualizations, effective systems and approaches could be designed and practiced for fisheries assessment and conservation with BLUE ECONOMY in Mauritius and other island countries