Spatial Assessment of Creek Habitats of Marine Fish Stock in Sindh Province

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Abstract : The Indus delta of Sindh Province forms the largest creeks zone of Pakistan. The Sindh coast starts from the mouth of Hab River and terminates at Sir Creek area. In this paper, we have considered the major creeks from the site of Bin Qasim Port in Karachi to Jetty of Keti Bunder in Thatta District. A general decline in the mangrove forest has been observed that within a span of last 25 years. The unprecedented human interventions damage the creeks habitat badly which includes haphazard urban development, industrial and sewage disposal, illegal cutting of mangroves forest, reduced and inconsistent fresh water flow mainly from Jhang and Indus rivers. These activities not only harm the creeks habitat but affected the fish stock substantially. Fishing is the main livelihood of coastal people but with the above-mentioned threats, it is also under enormous pressure by fish catches resulted in unchecked overutilization of the fish resources. This pressure is almost unbearable when it joins with deleterious fishing methods, uncontrolled fleet size, increase trash and by-catch of juvenile and illegal mesh size. Along with these anthropogenic interventions study area is under the red zone of tropical cyclones and active seismicity causing floods, sea intrusion, damage mangroves forests and devastation of fish stock. In order to sustain the natural resources of the Indus Creeks, this study was initiated with the support of FAO, WWF and NIO, the main purpose was to develop a Geo-Spatial dataset for fish stock assessment. The study has been spread over a year (2013-14) on monthly basis which mainly includes detailed fish stock survey, water analysis and few other environmental analyses. Environmental analysis also includes the habitat classification of study area which has done through remote sensing techniques for 22 years' time series (1992-2014). Furthermore, out of 252 species collected, fifteen species from estuarine and marine groups were short-listed to measure the weight, health and growth of fish species at each creek under GIS data through SPSS system. Furthermore, habitat suitability analysis has been conducted by assessing the surface topographic and aspect derivation through different GIS techniques. The output variables then overlaid in GIS system to measure the creeks productivity. Which provided the results in terms of subsequent classes: extremely productive, highly productive, productive, moderately productive and less productive. This study has revealed the Geospatial tools utilization along with the evaluation of the fisheries resources and creeks habitat risk zone mapping. It has also been identified that the geo-spatial technologies are highly beneficial to identify the areas of high environmental risk in Sindh Creeks. This has been clearly discovered from this study that creeks with high rugosity are more productive than the creeks with low levels of rugosity. The study area has the immense potential to boost the economy of Pakistan in terms of fish export, if geo-spatial techniques are implemented instead of conventional techniques.

Keywords : fish stock, geo-spatial, productivity analysis, risk