Estimating the severity of ecological vulnerability of Anzali coast using Multi-Criteria Decision-Making methods

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Received date:2019/09/24
Reception date: 2020/06/12

Abstract

Caspian Sea coast is very important due to special strategic conditions and unique ecosystems. But in recent years, the increase in the population living on these coasts and the severity of exploitation and pollution have caused many damage. Therefore, due to the high sensitivity and high value of these coasts, in this research, the ecological vulnerability of Anzali coast was carried out using multi-criteria evaluation methods based on GIS (AHP and Fuzzy Gamma) in the summer of 2018. 7 criteria and 13 sub-criteria were selected based on Delphi method and their information was entered in GIS. AHP model was used to weigh the layers. Layering standardization was performed based on Fuzzy Gamma procedure and finally the layers were combined and the final map of the ecological vulnerability of Anzali coast was prepared on this basis. The results of this study showed that various degrees of ecological vulnerability have been scattered in the region. The results of this study showed that 25% of Anzali coastal area (22919.6 ha) has severe and extreme ecological vulnerability, 19179.9 ha with moderate vulnerability, 47350.9 ha low vulnerability or without vulnerability. Also, soil and land use have the highest weight in determining areas with ecological vulnerability. The results of this study confirm the use of multi-criteria decision making methods for determining the coastal ecological vulnerability, and the finalized map can provide guidance to decision-makers in order to identify areas with high sensitivity in their monitoring programs.

Keywords: Ecological vulnerability, Fuzzy Gama, AHP, Caspian coast.