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Integrated ecological assessment and human pressures affecting the estuaries of the southern Caspian sea basin

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Abstract

Estuaries are one of the special and important aquatic ecosystems because they provide various services to their habitats and local communities. These unique ecosystems can be considered among the natural systems that suffer from the heaviest threats and pressures worldwide. Human societies use these ecosystems' services while imposing a significant negative impact on them. Therefore, these dynamic environments are increasingly subjected to diverse anthropogenic pressures, a trend also observed in the estuaries of the southern Caspian Sea basin. This research aims to conduct an ecological integrated assessment in various estuaries of the southern Caspian Sea basin (Iranian sector) at both watershed and local scales, using field surveys and various analyses. The findings indicate that most estuaries in this region are simultaneously influenced by multiple stressors across both spatial scales. Among the human pressures identified at the watershed scale are: 1- Changes in land use and land cover, such as the development of agricultural activities and urbanisation. 2- Dams and barriers that prevent fish migration. 3- Hydrological pressures resulting from excessive water extraction for unsustainable agricultural development. 4- Unregularly hydrological management of dams. 5- Water quality alteration due to urban, agricultural, and industrial wastewater. The results of this study also showed that human pressures at the local scale include: 1- Overfishing, 2- Presence of non-native species, 3- Changes in land use and land cover in the estuary, and finally, morphological changes in some estuaries. The authors believe that such assessment make multidimensional view of water bodies and provide very useful information for decision makers to take appropriate measures for restoration and management.

Keywords: Aquatic ecosystems, conservation, ecological integrated management, restoration

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