

## **Abstract**

**Human and climate have a major role in the destruction of natural ecosystems in recent years. Due to population growth and human activities, natural ecosystems have been under negative pressure. Natural cover in ecosystems has been destroyed or turned into residential and industrial uses due to unplanned human use of nature. Climate change also leads to rising temperatures, declining rainfall and, consequently, extending drought which has a great impact on natural ecosystems and land uses in areas such as agriculture and water resources. In order to protect natural ecosystems, it is important to know the impact of these two factors on ecological processes. The purpose of this study is to evaluate the effects of humans and climate in Hamoun International Wetland. By assessing the effects of humans and climate on the region, sensitive parts of the ecosystem are identified in relation to these two factors . To conduct this research, Landsat satellite images related to 1977, 2000, 2015, 2020 were used. In order to prepare the land use and land cover map and the habitat map of waterbirds in the region, a field visit to the region was conducted in 2020. The presence of waterfowl and shorebirds were recorded in the wetland to prepare a map of habitat suitability and land use characteristics and land cover. Land use and land cover map was prepared and along with other habitat factors was used to prepare the habitat suitability map. Landscape indices were also quantified in this period and changes in climatic parameters in the study period were investigated by calculating anomalies of mean annual temperature and precipitation. Changes in human land use area were identified using land use maps. Finally, changes in ecosystem in relation to changes in climatic parameters and changes in landscape metrics, habitat, and land cover classes were evaluated. The study of climatic parameters shows the increasing trend of temperature and decreasing precipitation. The waterbird habitat analysis show that the southern regions of Hamoun Saburi and parts of Hamoun Helmand have important habitat factors compared to other regions in unstable conditions and drought, so they are the best habitats in Hamoun wetland. Also, comparing the results of habitat changes and land features with land use area in upstream showed that despite the limited water resources and drought in the downstream, upstream water resources are stored behind dams and agricultural use has expanded. These results showed, in addition to the importance of preserving wetlands, it is necessary to regulate (or justify) human activities and protect important habitats in the wetland.**

**Keyword: Ecological processes, Climate, Landscape, Hamoun Wetland, Remote Sensing, Anomaly**



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# **Impact assessment of human and climate on ecological processes of Hamoun wetland**

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