# Ecological assessment and prediction of Sistan plain future in two scenarios: Normal and current conditions

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## Abstract

Past studies showed that the climate has caused widespread destruction in the Sistan plain in the form of a decrease in rainfall and an increase in temperature, and humans through the expansion of agriculture with an unsustainable pattern of water use. But to what extent have these factors caused destruction in the region, and if the current conditions continue, how different will this plain be from the normal conditions of the region in the next forty years? To answer this question in this research using satellite images, land use and land cover map of Sistan Plain in 1366 when the wetland was in a normal state, 1370 when the wetland had completed water intake and 1397 when the wetland was restricted. it was prepared. Then, using the Markov model, a land use and land cover map was prepared for the year 2017 if the conditions were normal. Comparison of this map and the current map showed how much the region has deviated from its normal state. Then, using the Markov model, the next 40 years of the region were predicted in two scenarios, the present and the normal state. Based on the comparison of the maps and land use area of the maps obtained from the first and second scenarios, it can be concluded that the vegetation and water cover in the southern parts of the Sistan plain will be lost in the next 40 years under the conditions of limited water resources compared to the normal state. Therefore, it is very important to implement protective measures to support the beneficiaries of the southern parts of the Hamun lagoon. In order to reduce the negative effects of drought in the Sistan plain, the results of this thesis are very important for knowing the ratio of land uses and their changes in the future in environmental planning. With such information, it is possible to predict the consequences of changes that threaten this plain in the future, and take appropriate measures to overcome the crisis or prevent or minimize the damage caused by it in long-term planning .

Keywords: Hamoun wetlands, Markov model, Landuse/ Landcover, Remote sensing