



University of Zabol

Graduate school

Faculty of Natural Resources

Department of Environmental Science and Engineering

**The Thesis Submitted for the Degree of M.Sc**

**Land use land cover change and cover in the lands around the Farah River and  
its effects on the expanding of dust sources in Hamoun Saberi**

**Supervisors:**

Dr. V. Rahdari

**Advisors:**

Dr. S. Maleki

Dr.A.Miri

**By:**

M.Noorizadeh

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## **Abstract**

Hamuns are fresh water lakes in the southeast of Iran and shared with Afghanistan. Pozak, Sabori and Hirmand Hamons are the three main parts of Hamon Lake. Hamon Sabori is located in the north of Zabul city, and the Farah River is the most important source of water for this lake, which passes near the city of Farah in Afghanistan and finally leads to Hamon Sabori. During the last three decades, due to the change of land use and land cover, especially the development of agricultural lands with high water demand and the destruction of vegetation, the water input of the Farah River to Iran has decreased, which causes the drying of the bed of this lake, which is made of fine-grained sediments. The drying of the Hamun Sabori bed, especially in the summer season, along with the 120-day strong monsoon winds, has created foci of soil harvesting and intensified dust storms in this area. In this thesis, in order to investigate the effects of agricultural land development on the water intake of Hamon Sabori wetland on one hand and the development of dust centers on the other hand, the time series of satellite images related to the Landsat sensor in the years 1370, 1380, 1390 and 1401 were used. The study years were chosen in such a way that they were as close as possible to the long-term average in terms of rainfall and wind speed. At first, necessary corrections such as atmospheric and radiometric correction were made on satellite images. Then, by examining the study area using Google Earth software, the area of the study area was selected from the upper reaches of Farah Province (Province) in such a way that it includes agricultural lands under the influence of Farah River to Hamon Saburi Lake. By applying the boundary of the area on the satellite images, the studied area was separated from the original image. Then, by performing a combined classification, including the use of unsupervised and supervised classification using the method of maximum similarity and using the SAVI plant index, it was prepared in 5 classes. The results showed that in the years 1370-1401, the area of agricultural land increased from 13438 hectares to 94425 hectares. Simultaneously with the increase in the area of agricultural lands, except for the year 2008 when the rainfall in the region was reduced, the water intake level of Hamun Sabori went from 154,370 hectares of water in 2010 to completely dry in 2010 and up to 74,258 and 5,400 hectares with water in 2010 and 1401 has arrived. The analysis of satellite images related to the summer of each year showed that the level of soil harvesting and dust centers are directly related to the water intake of the lagoon.

key words: Our wetlands, Hamon Sabori, Combined classification, Remote Sensing, Farah River.