

Assessment of desertification intensity using ESAs and IMDPA models in Bordekhun watershed

Abstract

Desertification is a global phenomenon that can occur anywhere and causes substantial damages. Hence research on desertification mitigation and prevention of its development is very essential. In this study, with quantifying the factors affecting the process of desertification based on ESAs and IMDPA models the current status of desertification in Bordekhun region was separately assessed and maps related to each of two methods was provided. Bordekhun region with an area of 214.11 km² is located in Daiyer city, Boushehr province. First, the working unit's map of the region was selected as the basic map for valuation of factors and indexes of interest. In the IMDPA method, by noting low precipitation, arid climate, blowing winds with velocity more than threshold velocity of wind erosion, water resources restrictions, decrease of groundwater level, extension of water and soil salinity, and vegetation degradation, five criteria of climate, wind erosion, water, soil and vegetation were recognized as essential in the study of desertification intensity. Scores associated with indices of each criterion were determined by using IMDPA model and for each index; a map was prepared by noting the conducted weighting. So that, qualitative map of the criterion obtained through employing the geometric mean of indices related to each criterion. Then, the map of current desertification potential status was created for the study area by the combination of the layers produced from each criterion, determination of their geometrical means, and also classification of resultant the map. In the ESAs method, four indices including climate quality, soil quality, vegetation quality, and land management quality were studied and scored. In this method, an information layer was provided for each of these indices. Finally, the desertification sensitivity map was prepared by calculating geometric mean of the values associated with four layers of information. The results showed that in the IMDPA method, %49.11 of the study area is classified in severe desertification class, and %49.89 of the study area in moderate class, and quantitative value of desertification intensity for whole the study area was obtained as DM=1.55 on the basis of these five criteria that is indicative of average desertification intensity in the region. Based on the ESAs model, %8.94 of the study area is located in the severe fragile type (f_3), %48.79 of the region in the average critical type (C2) and also near to %41.33 in the severe critical type (C3). Finally, the results showed that IMDPA method *is a suitable the study area and has good performance*

Keywords: Desertification, ESAs, IMDPA, Bordekhun



University of Zabol
Graduate School
Faculty of Natural Resources
Department of Range and Watershed Management

**The Thesis Submitted for the Degree of M.Sc
In De-desertification**

**Assessment of desertification intensity using
ESAs and IMDPA models in Bordekhun
watershed**

Supervisors:

Dr. A. Pahlavanravi
Dr. A. Moghaddamnia

Advisors:

Gh. Rahi

By: