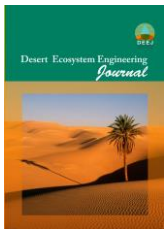
DEEJ (2020) 8 (25) 97-111

University of Kashan

Desert Ecosystem Engineering Journal

Journal homepage: http://deej.kashanu.ac.ir



Zoning of Ecological Vulnerability of Kerman Province to Achieve Sustainable Industrial Development Using AHP Technigue

Sosan Salajegheh[*1], Hamid Reza Jafari [2], sharareh Pourebrahim[3]

Received: 25/11/2019 Accepted: 02/02/2020

Extended Abstract

Introduction: Vulnerability of people and places is a complex phenomenon has been created as a result of human and environment interaction during the ages. The concept of vulnerability addresses the probability of being destructed or damaged of a society, structure, service or a geographical area due to a specific danger. Nowadays there is frequent demand for settling industrial infrastructures in disadvantaged area, where employment is necessary, considering vulnerability of such areas and limitations of available resources for development purposes, therefore; comprehensive and integrated planning in is essential in order to conservation of resources and defining vulnerability of ecosystem. There are different methods for assessment of ecological vulnerability. Analytical Hierarchy Process (AHP) is one of the common tools for this purpose. AHP is based on the premise that solutions for complex problems could be achieved if the complex structure effectively turned to simple and understandable structures. Since AHP has many desirable properties, it has been widely used in numerous quantitative researches including nature, society, economy and environmental vulnerability studies.

Materials and Methods: In this research, following statistics, data, information, maps and software in temporal and spatial scales are used: DEM map of the study area obtained from Iran Survey Organization, as well as maps of soil depth, rock type, faults, flooding and land cover of the study area obtained from Management and Planning Organization with 1:100000 scale. Also, AHP, Expert Choice and GIS (version 10.3) have used in this study. The purpose of the current research is assessment of ecological vulnerability of Kerman Province toward industrial sustainable development. As the first step, available information layers (slope, elevation, soil depth, rock type, and distance from faults, flooding risk and land cover) are coded according to sensitivity to vulnerability and then all the layers are transformed to raster maps with uniform

1. Ph. D Student in Environment Planning, College of Environment, Tehran University.
2. Associate Professor., Department of Environment, College of Natural Resources, Tehran University.
3. Professor, Department of Environmental planning and Management, College of Environment, Tehran University.

100-meter resolution gird using ArcGIS based on their assigned codes. Using hierarchical analysis technique, the layers are weighted and integrated.

Results: According to the final map which obtained from integration of seven previous maps, 19, 28.3, 27.9, 12.5 and 2.2 % of the study area are classified in terms of vulnerability respectively as very low, low, moderate, high and very high. This confirms that generally the study area has good or relatively good ecological resistance. The results demonstrated that Jiroft city has the highest vulnerability, while Rudbar-e Jonub, Kahnooj, Shahr-e Babak and Kuhbanan have the lowest vulnerability.

Discussion and Conclusion: The results revealed that Kerman Province has mostly good or relatively good ecological resistance. Placement of industries depends on a variety of parameters such as terrestrial, climatic and social-economic issues. According to every single of these parameters, it is possible to determine environmental vulnerability in different regions. In this study, physical parameters were solely considered as the main locating frame in Kerman Province, and assessment of environmental vulnerability is carried out on that, using different software, as discussed in the research method. The results of this research can be used easily by managers and planners in both industrial and environmental sectors of the province, and this will enable them to address minimum environmental indicators for development purposes. It is hoped that this will improve environmental indicators and also will bring sustainable industrial development in the region.

Keywords: Ecological Vulnerability, Analytical Hierarchy Process, GIS, Industry, Kerman, Sustainable Develop ment