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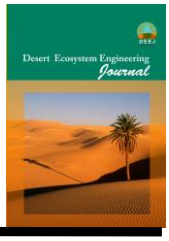

Developing and Prioritizing Desertification Risk Management Strategies Using Scenario Planning in Khorasan Razavi Province

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Extended Abstract

Introduction: Desertification is one of the most significant process of land degradation in all the world, especially in arid and semi-arid regions. In the United Nations Convention to Combat Desertification report (1994), Desertification is land degradation in dry-lands, resulting from various factors, including both climatic variations and human activities. This process is always associated with soil degradation, pollution and reduction of water resources, vegetation and other biological resources in natural and ecological conditions. Therefore, determining the main factors of this process can be very effective in proper land management. This research was conducted with the aim of zoning sensitivity areas to the desertification intensity based on ESAs model and providing management strategies based on scenario planning in Razavi Khorasan province.

Materials and Methods: In this research, five criteria such as climatic quality, soil, vegetation, erosion and management (human activities), and 20 indicators such as soil texture, soil depth, rock fragment, parent Material, vegetation density, fire risk, rainfall. drought, water and wind erosion, land use change, mining, livestock density in pasture, etc. were used. were used. Scoring and weighting of the indicators was done using a questionnaire and based on the expert opinions of specialists, executive managers and field experiments. The designed questionnaire included 21 questions, that classified in the form of 5 criteria of soil, climate, vegetation, erosion and management, which were distributed among the statistical population in two rounds. Management strategies and policies were also obtained in the Delphi method in the form of expert panels (brainstorming).

Results and Discussion: The results showed that the vegetation criteria with indicators such as the reduction of vegetation, the increase in the risk of fire in pastures and forests due to the continuous droughts of the past two decades and the increase in the intensity of wind and water erosion, with a value of 1.419, has had the greatest value and importance in expansion the intensity of desertification. After that, factors such as human activities (management), climate, erosion and soil respectively have had the greatest impact on the sensitivity areas to desertification in Khorasan Razavi province. In terms of the critical situation, the high percentage of the areas in the northwestern regions such as Quchan and Chenaran township due to the impacts of drought, severe changes in land use and water has become desertification. In the central, eastern and southern parts due to drought, land use changes, lack of optimal land management and wind erosion, main reason has been the expansion of desertification. Besides that, all the townships of Khorasan Razavi province have fragile conditions. This issue can be considered as an important and serious warning for the future management of Khorasan Razavi province. Therefore, in order to provide effective ways to deal with the intensity of desertification, based on the opinion of

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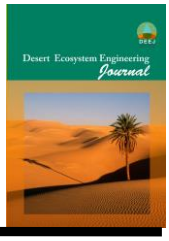

experts and specialists in the current research, by considering only the priority indicators of each of the criteria, the number of 10 cross matrix of the important indicators of each of the criteria, 20 scenarios, 6 strategies and more than 40 strategies were obtained. So that, by using the suggested strategies could be planned and managed according to regional and local conditions, to reduce the intensity of desertification.

Conclusions: The ESAs model uses four criteria of management, vegetation, soil quality and climate mainly to evaluate areas sensitive to desertification. So that, in this research, due to the importance of the erosion (water and wind erosion), for zoning map of sensitivity areas to desertification were used. In order to provide management plans (strategies and policy), to reduce and combat desertification in Khorasan Razavi province, management strategies such as; -sustainable management of vegetation, - water resources management and watershed management, - soil management, - livestock management and reduction of environmental hazards caused by human activities, -education, promotion and culture and sustainable management. Therefore, in this research, only the important strategies and policy that can provide a comprehensive vision of land management in Khorasan Razavi province, were suggested.

Keywords: Delphi method, Futures studies, Index, Land degradation, Soil erosion.

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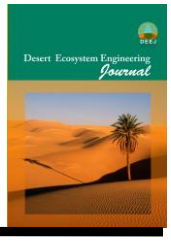
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