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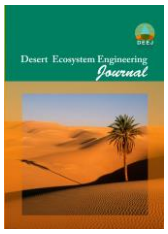

INVESTIGATING ENVIRONMENTAL FACTORS OF LAND INSTABILITY AND DESERTIFICATION POTENTIAL

Golam Reza Zehtabian[1]*, Ali Reza Moghadam Nia [2] Hosein Azarnivand[3], Ali Akbar Nazari Samani[4], Ali Reza Nejadmohammd Namaghi[5]

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Extended abstract

Introduction: More than 168 countries face the phenomenon of land degradation and desertification. Land use changing and more exploitation of nature's potential in arid and semiarid ecosystems over the past three decades have increased the trend of desertification phenomena in these ecosystems. Deserts are dynamic ecosystems that are constantly evolving. Deserts are dynamic ecosystems that are constantly evolving. The management of ecosystems in arid and semi-arid regions is continuous and unstoppable. For this reason, desert planners are faced with complex ecological processes such as climatic, edaphic factor, and water resources. Therefore, in order to have a better understanding of these factors and processes, it is imperative that all of these environmental instability factors be investigated and properly identified in the evaluation models of the contribution of each factor.

Materials and methods: The study area is Fadiyeh of Torbat Heydarieh basin, with an area of 8664 hectares and 40 work unit. The IMDPA model was used to assess the intensity of desertification potential. Environmental criteria that are evaluated in this model include climate, geology and geomorphology, soil, vegetation, agriculture, water and irrigation, water erosion, wind erosion (Zahtabian et al. 2014). In this model, 35 indicators for 9 criteria are used to quantify the criteria. Based on its effect on desertification, according to the region's conditions, field research, and expert opinion, each indicator is weighted between 1 and 4. So that value 1 is the best and the 4 is the worst weight. A map is prepared for each index with respect to weighting. In this method, each criterion is obtained from the geometric mean of its indices according to the following relationships.

$IMDPA= [\cap 9i = 1Qi]\ 1/9=9\sqrt{Q_1 \times Q_2 \ldots Q_9}$

Criteria-x = [(Index-1) × (Index-2). (Index - n)]1/n

Criteria-x: Selected Criterion

Index: Indicators of each Criterion

1. Faculty full professor at University of Tehran; ghzehtab@ut.ac.ir
2. Faculty associate professor at University of Tehran
3. Faculty full professor at University of Tehran
4. Faculty associate professor at University of Tehran
5. PhD Student of University of Tehran

n: Number of Indicators for each Criterion

By analyzing the environmental instability factors, two models of SLM and IMDPA were prepared and then, by comparing two models, the most important environmental instability factors in the region were identified for future managers' planning

Results: Investigating the instability of the climatic factor: The average annual rainfall is 335 mm. The maximum monthly rainfall in March is 72 and the lowest rainfall in August and September is less than 1 mm, and it is also observed that in this area more than 50% of annual rainfall in the three months of the year, namely, February, March and April It takes place in the dry period in six months from mid-May to mid-November.

Investigation of geoscience and geomorphology: Investigation of Stratigraphic Units: Geological Study Area. It is part of the Central Iranian mountain range. Geological units belonging to the Jurassic, Cretaceous, Neogene and Quaternary periods have been formed in terms of lithology development and diversity. The Jurassic organization consists of two units called the Jbe and the Esfandiar limestone (Je), which includes the oldest basement rocks**.**

Investigation of Soil Agent Instability: According to the studies, the study area consists of 4 land types

Mountain type: Very damaging lands with very high tide and height.
Type of hills: Hills are equivalent to erosion or aggregation geomorphologic levels that have been completely destroyed. There is no remnant of the previous levels with a smooth surface.
Type of plateau and upper terraces: This type of physiography is equivalent to eroding and cumulative geomorphologic levels that are currently affected by low to moderate erosion processes.
Type of River Alluvial Plain: This type of land is formed by depositing small sediment deposited from a main active or inactive river stream.

Investigation of plant vegetation instability: Rangeland condition is also poor in all types and pasture tendency is negative. The yield of plant production in these types is between 33 and 76 kg / ha, and most of the plant production is related to annual grasses. The results showed that by comparing desertification severity maps and assessing sustainable land management, the most important factors of environmental instability were, respectively; Vegetation utilization index in vegetation criteria, the type of land use index water erosion criteria, Vegetation index in wind erosion criteria. By comparing the trend of changes (compared to 1382 with 1393), groundwater drop index and water criterion are the most important causes of instability.

Discussion and Conclusion: The most unstable is in the upper plain area and the highest intensity of desertification potential in the plain area.

By comparing the prepared desertification maps and assessing sustainable land management, the most important known environmental index in each criterion include Drought index in the climate criterion, vegetation cover index in vegetation cover, land use type index in the measure of water erosion and vegetation index in the wind erosion criterion in the study area. Among the criteria for assessment, vegetation and erosion criteria, show the highest weight for the region's instability and the severity of desertification. Due to the importance of this problem, various methods for estimating or evaluating desertification have been presented and criticized so far. However, despite the progress made, there are many problems with the use of desertification assessment methods, including the fact that these methods are still largely based on judgment and expert opinion that, with disagreement with the public opinion Relations with degraded lands have even led the national level.

Keywords: SLM model, IMDPA model, sustainable land management, arid and semi-arid ecosystems.