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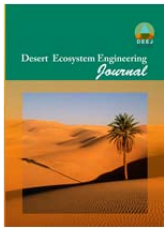

Investigating Desertification Management and Rehabilitation Projects in Yazd-Ardakan Plain

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Extended Abstract

Introduction: The phenomenon of desertification has always been considered as one of the most important challenges facing Iran, which has been aggravated by human and climatic factors in recent years. Therefore, it is necessary to implement anti-desertification plans and projects set through the Development planning to curb desertification and restore and improve degraded lands. In this regard, the severity of the phenomenon can be decreased by applying appropriate management solutions and methods and preventing its expansion and progress. Implementing anti-desertification management and rehabilitation projects according to the ecological conditions of each region improves the condition of the vegetation, strengthens the soil stability, and protects the soil from the risks of water and wind erosion. Therefore, analyzing different aspects of the anti-desertification projects which are planned and carried out by the government is required for improving management in the natural resources sector. One such measure can be the restoration of desert pastures with regard to unfavorable climatic conditions. Thus, this study set out to investigate the influence of anti-desertification management and restoration projects in improving soil stability indicators and vegetation characteristics.

Materials and methods: This study was conducted in four sites located in the Yazd-Ardakan plain, including the seedling site, the water weed management site, the mulched site, and the enclosure site. The main species investigated in each of these sites was *Haloxylon aphyllum*. To this end, four transects were placed in the site at regular intervals. It should be noted that the transects were placed parallel and perpendicular to each other in flat and sloping areas, respectively. The number of plots on each transect was 15 and the area of the plots was 210 cm. Moreover, the index Plant characteristics such as canopy percentage, density, reproduction, and freshness of *Haloxylon aphyllum* species were measured. Finally, after collecting the required data, statistical analysis was performed using the SPSS software.

Results: According to the results of statistical analysis performed via independent t-test, a statistically significant difference was found in the percentage of vegetation and density at the error level of 1% in all investigated sites. Duncan's multiple range test revealed significant differences in mean values among treatments. The treatment associated with herbaz exhibited the highest mean values for vegetation cover (72.5%), plant density (75.4), regeneration (542.0), and vigor (33.61). Conversely, the treatment subjected to enclosure showed the lowest mean values for vegetation cover (68.1%), plant density (2.0), regeneration (111.0), and vigor (24.12).

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Conclusion: Compared to the control area, the percentage of vegetation and density of the effective area was significant in the seedling site (where the seedling project is based on seedling irrigation), which is due to the lack of suitable conditions and rainfall in the seed establishment. The wastewater management site demonstrated increased vegetation cover and density due to enhanced water infiltration and readily available moisture, which facilitated plant establishment and growth. Similarly, the mulched site exhibited higher vegetation cover and density compared to the control, attributable to the creation of a subsurface moisture layer beneath the mulch, providing a favorable environment for seed germination and plant development In the enclosure site which is less affected by human changes, the amount of soil erosion and ecosystem destruction is lower than other sites in all dimensions, leading to the higher percentage of vegetation and plant density. The establishment and expansion of vegetation cover through various methods have been implemented in recent decades as a means to combat desertification and mitigate the damages caused by dust storms in arid regions. However, water scarcity poses a significant constraint. Consequently, it is recommended that, in the context of desertification management and rehabilitation projects in the Yazd-Ardakan plain, the most effective approaches be prioritized as follows: runoff water management, mulching, afforestation, and enclosure.

Keywords: Density, Enclosure, Plot, Seedling, Stability, T-test.