Research Paper

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Modeling the Effects of Management Actions to Improve the Status of Water and Soil Resources of Tuyserkan Watershed in mDSS Software Environment

Ehsan Alvandi *

Graduated Ph.D. Watershed Management, Gorgan University of Agricultural Sciences and Natural Resources, Gorgan, Iran

1-Introduction

Water and soil loss is one of the most important issues and problems we face today; therefore, management of water and soil loss is essential in order to properly exploit and reduce degradation. For this purpose, in this research, Modeling the effects of management Actions to improve the status of water and soil resources of Tuyserkan watershed in mDSS software environment have been studied.

2-Methodology Author

For this purpose, first, the status of the watershed system was analyzed through the DPSIR approach. Then, according to the results of DPSIR approach and prioritization of solutions, according to the opinions of experts seven proposed management activities were prepared to improve the condition of water and soil resources of the basin and reduce pressures. In order to predict the effects of each management activity from the indicators obtained from Four physical, social, economic and ecological criteria were used. Finally, in order to prioritize the proposed management activities, TOPSIS and SAW techniques have been used in the mDSS software environment.

3- Results and Discussion

According to the results of the DPSIR approach, the most important pressures affecting the system Land use change, Capture and vegetation loss have been introduced. Also, one of the most important effects on the status of the watershed system is the criteria for vegetation loss, reduced groundwater recharge and increased risk of flood damage. Finally, according to the results of the DPSIR approach, to improve the status of water and soil resources A set of solutions for biological rangeland improvement and biomechanical operations to store rainfall in the basin was proposed. According to the opinions of experts and environmental conditions of the region from a set of solutions for biological improvement of rangeland and biomechanical operations Seven management

* Corresponding Author; **E-mail:**alvandiu_2010@yahoo.com

activities (Rangeland exclusion, Afforestation, Orchard development, Forage cultivation, Contour furrow, Pile seeding and Seeding) were selected to store rainfall. According to the results obtained from the prioritization of management activities in all proposed methods, Afforestation activity has the highest score and is in the initial priority and the activity of Contour furrow has the lowest score and is in the final priority.

4-Conclusions

Therefore, according to these results, Afforestation in this basin is considered an important activity that should be given special attention and other activities are placed in the next priorities. Therefore, in order to better manage watersheds and achieve sustainable development, more attention should be paid to vegetation-based management activities and should be on the agenda of managers and planners. It is also recommended to plant native and region-compatible trees such as almond, sumac and elm.

Keywords: Multi-criteria decision making, TOPSIS, SAW methods, mDSS software, Tuyserkan, Western Iran.