Abstract

Management and operation of water resources in arid areas is very important in order to maximize the productivity of water resources, the damage caused by water shortages in these areas will be minimized. The purpose of this research was water resource management with reciprocal approach to desertification and microorganisms in Sistan region using an ideal planning method. The ideal goal planning is one of the most important ways to solve multi-objective optimization problems. The GAMS programming environment was used to design the research model. The results of the research showed that in order to deal with the phenomenon of microorganisms, the priorities for water transfer were as follows: supply of water for domestic use (Drinking) Zabul and Zabul villages, environmental allocation of Hamoon wetland and supply of water needed Seedlings are the wind tunnel removal sites. In the current situation, certain water levels from reservoirs are not allocated for the biological well-being of the wind erosion centers, and the amount of water transferred to the Hamoon wetland is negligible. To do this, after implementing the research model and in optimum water management, in addition to meeting all the water needs of the household consumption, the amount of water transmitted to the Hamoon Lake to provide its minimum water requirement was 61.4 million cubic meters. Thus, water needed for the stabilization of the critical points of the Hamoon Wetland is fully provided. Also, in optimal management conditions, the amount of water transfer to Natek, Nezamak, Shahr-e-Shah Karam and Jazinak seedlings is 6.35, 2.11 and 8.14 million cubic meters, respectively,as a result, a large amount of its water requirement has been resolved. The results of this research show that in optimal water management conditions in addition to meeting the basic needs of the region, water transfer to critical points of the sediment can be increased and it can be stabilized by the origin of wind sediments in the region.

Key words: Desertification, Water management, optimal allocation, Sistan

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