

Rainwater Harvesting and Management of Ground Water (Case Study Weather Modification Project in Iran)

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Abstract : Climate change and consecutive droughts have increased the importance of using rainwater harvesting methods. One of the methods of rainwater harvesting and, in other words, the management of atmospheric water resources is the use of weather modification technologies. Weather modification (also known as weather control) is the act of intentionally manipulating or altering the weather. The most common form of weather modification is cloud seeding, which increases rain or snow, usually for the purpose of increasing the local water supply. Cloud seeding operations in Iran have been married since 1999 in central Iran with the aim of harvesting rainwater and reducing the effects of drought. In this research, we analyze the results of cloud seeding operations in the Simindasht plain in northern Iran. Rainwater harvesting with the help of cloud seeding technology has been evaluated through its effects on surface water and underground water. For this purpose, two different methods have been used to estimate runoff. The first method is the US Soil Conservation Service (SCS) curve number method. Another method, known as the reasoning method, has also been used. In order to determine the infiltration rate of underground water, the balance reports of the comprehensive water plan of the country have been used. In this regard, the study areas located in the target area of each province have been extracted by drawing maps of the influence coefficients of each area in the GIS software. It should be mentioned that the infiltration coefficients were taken from the balance sheet reports of the country's comprehensive water plan. Then, based on the area of each study area, the weighted average of the infiltration coefficient of the study areas located in the target area of each province is considered as the infiltration coefficient of that province. Results show that the amount of water extracted from the rain with the help of cloud seeding projects in Simindasht is as follows: an increase in runoff 63.9 million cubic meters (with SCS equation) or 51.2 million cubic meters (with logical equation) and an increase in ground water resources: 40.5 million cubic meters.

Keywords : rainwater harvesting, ground water, atmospheric water resources, weather modification, cloud seeding

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