

Abstract:

Sistan has always been affected by drought, high evaporation, increased use and uncontrolled use of water in the upstream of the Sistan River, exacerbated desertification, and severe dust storms due to the hot and dry climate of many years. The crisis of healthy water scarcity, like other countries, especially arid and semi-arid countries, needs to be addressed by increased rainfall programs. Demand for climate change services is on the rise because of consumable water resources. One of the ways to increase rainfall and to cope with drought is cloud reproduction. In the present study, the feasibility of cloud fertilization in Sistan region and the implementation of cloud fertilization operations in time and space have been studied. For this purpose, the microphysical properties of important and influential clouds and parameters have been used.

To do this, the average cloudy days in the region in the last four years were obtained from the Sistan and Baluchistan Provincial Meteorological Office, and the days with a cloudy average above 6 were selected and imaged. Then, data was obtained from NASA and atmospheric and geometrical corrections were performed on the images, and the layers showing cloud canopy temperature, cloud thickness, cloud height, effective radius of saturation were separated from the rest of the layers. In the next step after cloud fertilization criteria were used in software formulation. After scripting the appropriate model, the required map outputs were prepared that are suitable for fertilization, and the results were that the rainfed masses that came to this area.

Finally, data were analyzed satellite maps with weather information and the results of that:

1. In Sistan area, environmental parameters, especially minimum humidity, minimum wind speed and maximum temperature are very effective in precipitation.
2. The minimum moisture content should not be less than 60%.
3. The maximum temperature should not exceed 11 ° C.
4. The minimum wind speed must be less than 22 mph.
5. Although in past research cloudiness is expressed favorable than 6, in the presence of moisture above 60% and low wind speed precipitation and cloudiness over 4.5 are also possible.
6. Cloudy criteria and rainfall potential are required, but the occurrence of precipitation requires the rule of favorable climatic conditions.

7. It is very difficult to determine the precipitation potential of clouds by remote sensing and studying climate data at the same time.



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Feasibility of input clouds to sistan area for fertilization

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