

## عنوان مقاله:

Water resources carrying capacity before and after volcanic eruption

## محل انتشار:

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## خلاصه مقاله:

**BACKGROUND AND OBJECTIVES:** Water resources carrying capacity is dynamic and can be influenced by catastrophic volcanic eruptions. The eruption of Mount Merapi in ۲۰۱۰ changed the landscape and community livelihoods due to the redistribution of a large volume of volcanic materials. This study aims to analyze water resources carrying capacity before and after the major ۲۰۱۰ eruption of Mount Merapi. **METHODS:** The value of water resources carrying capacity is derived from that of water availability and the domestic water needs per capita per year. The model uses a grid of ۱۰۰ x ۱۰۰ meter cells to determine the spatial distribution of water resources carrying capacity in Krasak watershed, and this analysis considers the years ۲۰۰۸, before the eruption, and ۲۰۲۱, after the eruption. The population distribution data have been previously mapped by referring to statistical data and land use at the village level, while water availability is calculated considering rainfall, potential evaporation rate, and runoff. **FINDINGS:** Water resources carrying capacity in Krasak watershed has undergone changes related to the distribution of volcanic material and human activities. The water resources carrying capacity for both periods experienced a surplus, although there has been an average decrease of ۳۳۱.۵۰ cubic meters per year for each grid cell. Water resources carrying capacity analysis shows a decline, especially in the midstream and downstream. Based on T-Test, there are significant changes in the water resources carrying capacity at ۲۰۰۸ and ۲۰۲۱ (p-value ۰.۰۴۷ and ۹۵% confidence level). **CONCLUSION:** Water resources carrying capacity increased only in some locations that occurred ecosystem succession after the eruption, although areas near the peak are decreased by sand and stone mining. The spatial-gridded model proved capable of analyzing this phenomenon

## کلمات کلیدی:

Mount Merapi, Spatial-gridded model, Water availability, Water needs

