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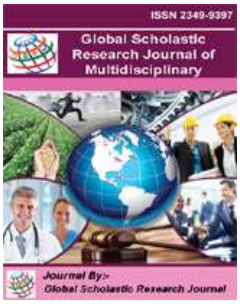

EFFECT OF RAINFALL VARIABILITY, WATER DEMAND AND STORAGE SIZE ON THE HARVESTED RAINWATER IN SWAZILAND

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Abstract

A study to assess the effect of rainfall variability, varying water demand and storages sizes on the duration of the collected rainwater for domestic purposes in the drought prone areas of Swaziland was conducted in the Lowveld region. The choice of the Lowveld was motivated by the fact that it is prone to drought and experiences acute water shortage problems. The objectives of the study were to determine the: (i) effect of rainfall variability on the annual amount of rainwater to be collected (ii) effect of varying the water demand on the duration of water use of the harvested rainwater (iii) effect of varying the size of water storage facilities on the duration of water use of the harvested rainwater. Rainfall data was collected from the Meteorology Department. The study shows that the amount of rainfall in the Lowveld region of Swaziland decreases considerably from north to south. The findings also reveal that there is a direct relationship between size of storage device, level of water use per day, and duration of use of the collected rainwater. The relationship is that when you increase the level of water use, the duration of use of the collected rainwater is shortened. However, if the level of water use is not increased while the size of the storage facility is increased, the collected rainwater is able to sustain the demand for a two year consecutive period without any shortages. However, when the level of water use was increased to 4500 L/month with the storage size of 10000 L/month the collected rainwater was not able to meet the demand and the duration of the water use decreased from north to south of the Lowveld region.

Keywords: Rainwater harvesting; Rooftop; Lowveld region; water demand; Storage device; duration of water use

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