



Harvesting and Saving on the Slopes of Mt. Elgon, East Africa

Barasa Bernard ¹ and Asaba Joyfred¹

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Academic Editor: Salvatore Gambino

Received	Revised	Accepted	Published
10 Mar 2020	08 May 2020	11 Jun 2020	18 Jul 2020

Abstract

Despite the achievements reported from using rainwater harvesting systems, the contribution and drawbacks that affect their usage in mountainous landscapes have received little attention. The uptake and usage of domestic rooftop rainwater harvesting systems (RRWHS) in developing countries is on the increase due to increasing water scarcities. We explored the effect of rainfall variability on water supply and the downsides of using the systems by rural households in Uganda. The objectives were to assess the variability of rainfall (1985–2018), categorise RRWHS used, and examine the influence of slope ranges on the placement of systems and also to quantify the harvested and saved rainwater and establish the factors that affected system usage. Rainfall variability was assessed using a Mann–Kendall test, while system contributions and drawbacks were examined using socioeconomic data. A representative of 444 households were selected using a multicluster sampling procedure and interviewed using semistructured questionnaires. Findings revealed that the months of March, April, September, August, and October experienced an upward trend of rainfall with a monthly coefficient of variation between 41 and 126%. With this, households responded by employing fixed (reinforced concrete tanks, corrugated iron tanks, and plastic tanks) and mobile RRWHS (saucepans, metallic drums/plastic drums, jerrycans, and clay pots). At the high altitude, households deployed mostly plastic jerrycans and industrial plastic/metallic drums to harvest and save water. Overall, the mean annual volume of rainwater harvested on the slopes of Mt. Elgon was 163,063 m³/yr, while the potential to save water ranged from 4% to 7% of the annual household water demand. The factors that hindered the deployment of RRWHS to harvest and save water were high operational costs, price fluctuations, unreliable rainfall pattern, inadequate funds, and limited accessibility. The rainfall received if well-harvested and saved can redeem households of

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