

**ASSESSING HOUSEHOLD WATER USE, SUPPLY PATTERNS AND
MANAGEMENT CHALLENGES IN MATHIOYA SUB-CATCHMENT,
KENYA**

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Requirements for the Award of the Degree of Master in Environmental Science
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DECLARATION AND RECOMMENDATION

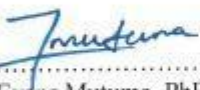
Declaration


This thesis is my original work and has not been presented for the award of diploma or conferment of degree in any other university.

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Recommendations

The thesis has been examined, passed and submitted with our approval as University supervisors.

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DEDICATION

I dedicate this work to my loving family, whose unwavering support, encouragement and prayers have been my source of strength throughout this journey. To my parents, who instilled in me the values of hard work, perseverance and determination, I remain forever grateful. I also dedicate this thesis to my friends and colleagues who continually inspired and motivated me to stay focused. Above all, I dedicate this work to the Almighty God for granting me wisdom, good health and the resilience to complete this study.

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ABSTRACT

Water scarcity and management inefficiencies remain pressing challenges in many developing countries, particularly in the face of climate variability, rapid population growth and infrastructure deficits. In Mathioya Sub-catchment, a critical gap remains in balancing water supply and demand at the household level. The growing urban development and rising demand for water have outpaced the capacity of current management strategies, leading to seasonal shortages, inconsistent supply and overextraction from natural sources. While policy instruments and interventions such as Integrated Water Resource Management (IWRM) and pricing mechanisms exist, their effectiveness in addressing sectoral disparities and ensuring equitable access to water for domestic users remains unclear. This study examined household water consumption behavior, supply-demand dynamics and management challenges in the Mathioya Sub-catchment of Kenya's North-West Upper Tana Catchment. The objectives were: To determine the level of water consumption in domestic households with piped water in the Mathioya Sub-catchment; To evaluate the water demand and supply patterns in domestic households in the Mathioya Sub-catchment; and to establish the existing gaps in water management strategies related to household water demand and supply Mathioya Sub-catchment. Using a descriptive survey design and a sample of 400 households from a target population of 28,400, data were analyzed through One-Sample T-tests. The findings revealed statistically significant responsible water use among households (mean = 3.94, $p < 0.001$), although daily monitoring practices were less consistent (mean = 3.51, $p < 0.001$). Households largely agreed that their water needs were met (mean = 4.12, $p < 0.001$) and that tariffs were affordable (mean = 4.15, $p < 0.001$). However, seasonal shortages remained a major concern (mean = 4.14, $p < 0.001$), contributing to increased reliance on storage and alternative water sources. These results reflect broader trends in supply variability observed across rural Kenya and sub-Saharan Africa. Despite strong community efforts to promote water conservation (mean = 3.95, $p < 0.001$), institutional challenges were evident. Respondents perceived local authority education efforts as inadequate (mean = 2.91, $p < 0.001$) and water policy awareness as moderate (mean = 3.25, $p < 0.001$). The study concludes that households in the Mathioya Sub-catchment generally practice responsible water use and are aware of water-saving measures. However, the availability of piped water is irregular due to seasonal shortages and unreliable supply patterns. Additionally, there are major gaps in water management, particularly in public education and community engagement. The study recommends strengthening institutional support, clarifying water use policies and enhancing public education on water conservation practices. It also advises improving household-level water monitoring and addressing infrastructure challenges to ensure a consistent and equitable water supply.

