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ABSTRACT

Rainwater harvesting is an important coping strategy in rural areas with limited and unreliable water supplies. This study examined rainwater harvesting practices among residents of Mutama-Bweengwa in Pemba District, Southern Province, Zambia. The study used a convergent parallel mixed-methods design. Household interviews involved 379 randomly selected respondents and 11 key informants selected purposively. Data came from household interviews, key-informant interviews and direct field observations. Descriptive statistics and thematic analysis showed that 99.47% of respondents practised at least one form of rainwater harvesting. Buckets and wells (96.6% each) and dams (93.2%) were the most frequently reported methods. Rainfall variability, affordability, available technology, roofing type and technical knowledge influenced practice. Limited storage, costs and insufficient technical support constrained improved systems.

Keywords: rainwater harvesting; rural water management; Mutama-Bweengwa; Pemba District; Zambia

1. INTRODUCTION

Rainwater harvesting can supplement unreliable rural water supplies and support household production where rainfall is seasonal (Handia et al., 2003; Malambo & Huang, 2016). In Mutama-Bweengwa, locally adapted practices help residents collect, store and conserve water for households, livestock and farming under recurrent rainfall variability (Tena et al., 2021).

RESEARCH GAP

Limited evidence in Zambia documented the practices communities used, the factors influencing them, and their benefits and constraints.

RESEARCH OBJECTIVES

- 1 To examine rainwater harvesting practices among the residents of Mutama-Bweengwa
- 2 To find out the factors influencing rainwater harvesting practices in Mutama-Bweengwa area.
- 3 To analyse the pros and cons of rainwater harvesting technologies in Mutama-Bweengwa area.

2. STUDY AREA

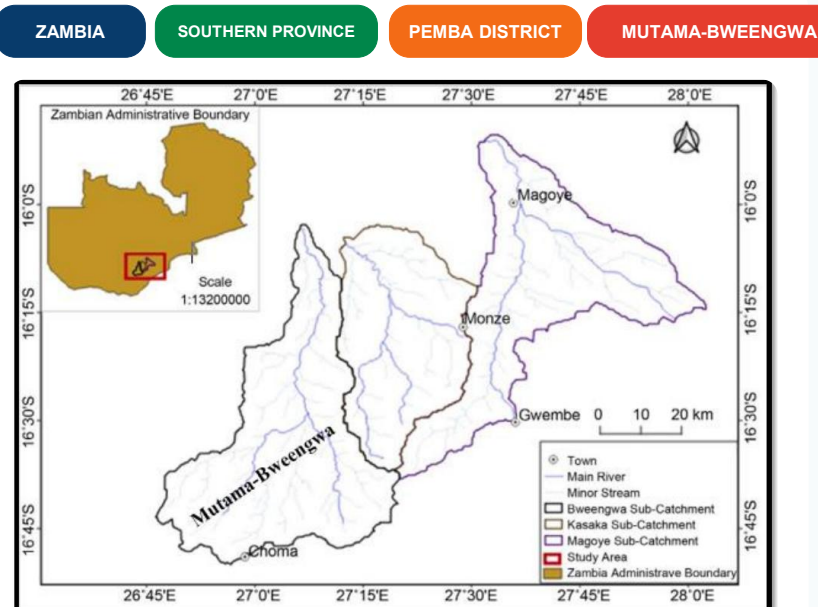


Figure 1. Location and hydrology of the Mutama-Bweengwa study area

Mutama-Bweengwa lies in Pemba District, Southern Province, Zambia, within the Lower Kafue sub-catchment. The predominantly rural area depends on seasonal rainfall and agriculture (Tena et al., 2021).

3. METHODOLOGY

Research design

Convergent parallel mixed-methods

Household sample

379 randomly selected respondents

Key informants

11 purposively selected

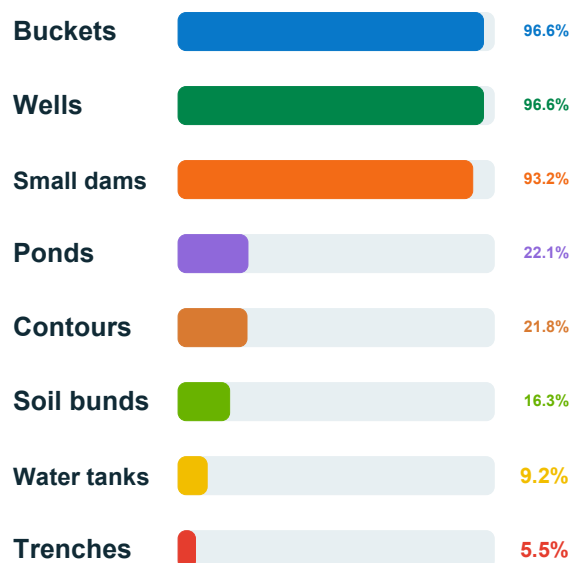
Data collection

Household interviews, key-informant interviews and direct field observations

Data analysis

Descriptive statistics and thematic analysis

4. TYPES OF RWH PRACTISED (% OF RESPONDENTS)



99.47% practised at least one form of rainwater harvesting

5. RWH TYPES AND PRACTICAL BENEFITS

RWH TYPES



Stone water-harvesting structure



Catchment conservation system with well + weir*

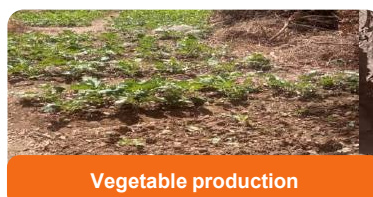


Direct rain collection in buckets and basins*

BENEFITS



Household water use



Vegetable production



Livestock water from a small dam*

Field photographs: thesis, 2022. *Illustrative scenes

6. KEY FINDINGS

WIDESPREAD PRACTICE

RWH formed part of everyday water management.

MOST REPORTED METHODS

Buckets, wells and dams had the highest reported prevalence.

INFLUENCING FACTORS

Rainfall, affordability, technology, roofing type and technical knowledge mattered.

CONSTRAINTS

Limited storage, costs and insufficient technical support constrained improved systems.

BENEFITS

Residents associated RWH with water access, farming and reduced dependence on unreliable sources.

7. CONCLUSION

Residents of Mutama-Bweengwa use diverse, locally adapted rainwater-harvesting and water-management practices. Climate-resilient interventions can build on these existing practices by improving storage, technical support, training and suitable infrastructure.

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