



Are sand dams the answer to dryland water insecurity?

Introduction

Drylands are home to one third of the world's population but face severe threats to water security. Sand dams conserve water resources for use in the dry season (Figure 1).

This study seeks to understand the contribution that sand dams make to water security by studying abstraction patterns.

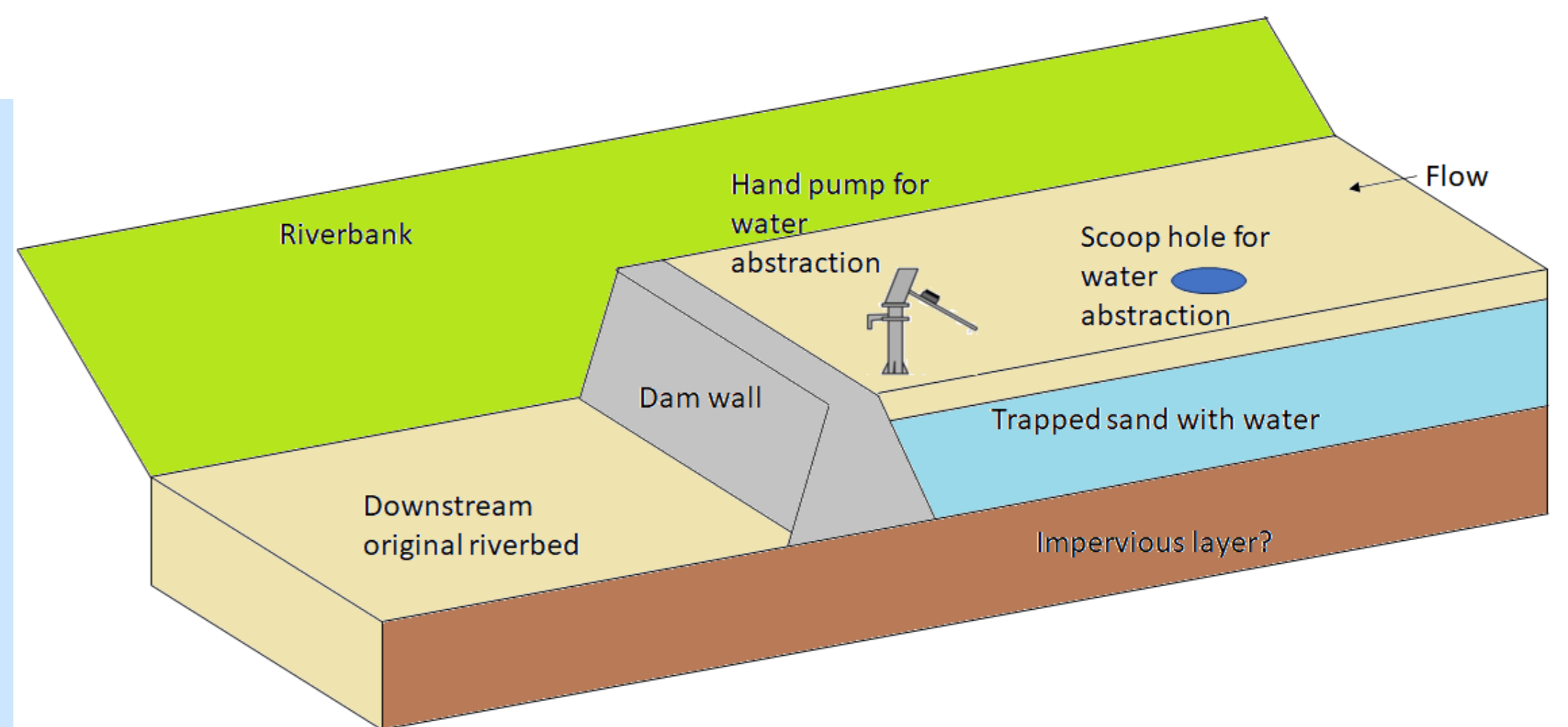


Figure 1: Sand dam schematic

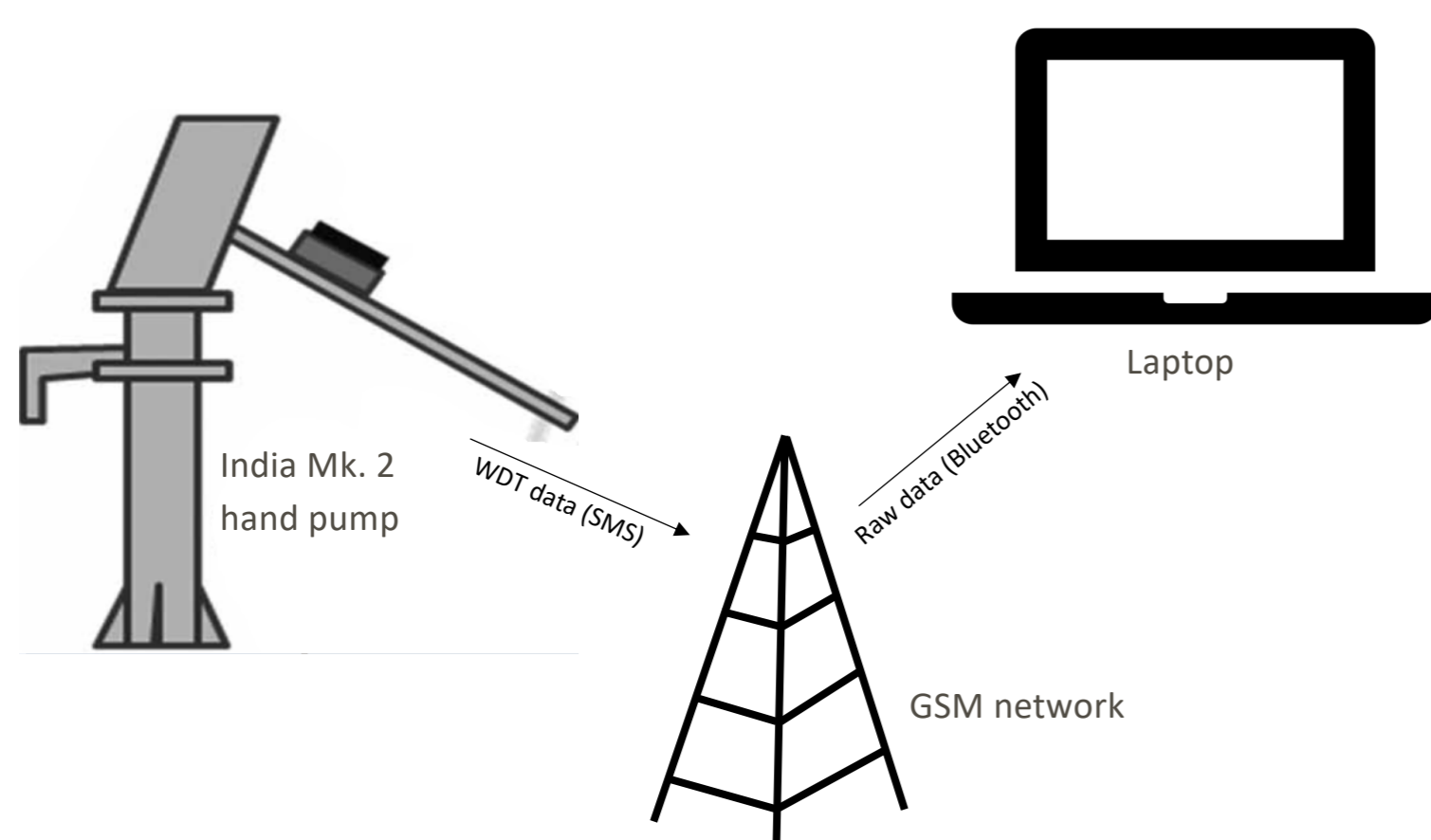


Figure 2: WDT set-up

Method

Waterpoint Data Transmitters (WDT) (Figure 2) were fitted to 26 sand dam hand pumps in SE Kenya.

WDT's measure the number of times the pump handle moves over an hour and converts this into volume of water abstracted.

Results

Median daily abstraction varied between pumps from 2 L/day to 2962 L/day.

Median abstraction was much higher in the long dry season (444L/day) compared to 14.5L/day in the short dry season.

21 handpumps had abstraction data at the end of at least one long dry season. 59.1% of these met drinking water needs (2 L/p/day) independently of other sources.

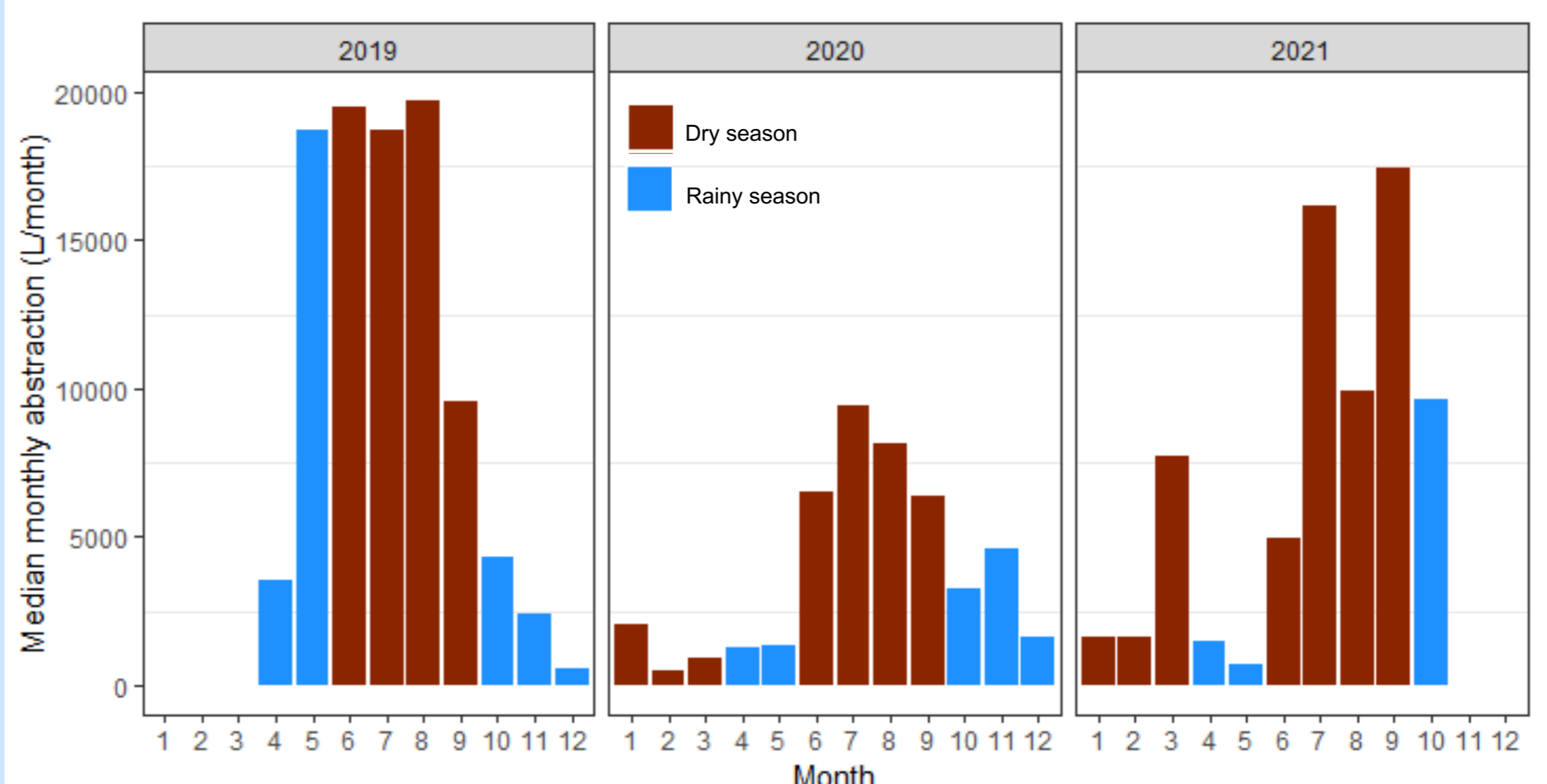


Figure 3: Patterns of monthly abstraction

Conclusion

Sand dams positively contribute to year-round water security. However, no single technique by itself is the answer to dryland water insecurity - a holistic approach to water management must be taken

Thesis papers

Ritchie et al. (2021). Sand Dams as a Potential Solution to Rural Water Security in Drylands. *Frontiers*. <https://doi.org/10.3389/frwa.2021.651954>

Ritchie et al. (Accepted). Sand dam contributions to year-round water security. *Environmental Monitoring and Assessment*.

Ritchie et al. (In Prep.). Interaction of sand dams with the local hydrogeological system.

Ritchie et al. (In Prep.). Lateral and longitudinal loss from sand dams.

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