Rainwater harvesting from roads enhanced indigenous pasture establishment in a typical African dryland environment

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### Introduction

- African drylands cover approximately 41% of sub-Saharan Africa landmass and about one-third of the global drylands (Vohland and Barry, 2009).
- Free ranging livestock production system in rangelands is a key source of livelihood in African dryland environments.
- Increased pressure on forage resources, climate variability and change has contributed to shrinkage of feed resource base, thus threatening livelihoods.
- Combining in-situ rainwater harvesting and indigenous grass reseeding can restore denuded pastures in African drylands.
- Reseeding plays a pivotal role in detached dryland landscapes (via seed dispersal or seed banks) (Sheley et al., 2006)
- In-situ rainwater harvesting ensures sufficient capture of water and prolongs soil moisture availability for seed germination and subsequent establishment

### Objective

To determine the potential of rainwater harvesting from roads and diverting the generated runoff into established trenches for enhanced pasture production and rehabilitation of degraded African dryland landscape

### Study Site and Methods

- **Location** – Kitui County, southeastern Kenya (map below).
- **Climate** – Annual average rainfall 300-800 mm, mean annual temperatures 14-34 °C (Schmitt et al. 2019).
- **Soils** – Cambisols. pH 6.62; NH4+ 1.33 µg g soil; NO3- 0.6 µg g soil; Carbon 0.58 %; Nitrogen 0.05 %; C:N ratio 10.90

![Project site layout](image)

**Figure 1:** Project site layout
- EM – Enteropogon macrostachyus
- CC – Cenchrus ciliaris
- EM – Eragrostis superba

![Study location](image)

**Figure 2:** Study location

![Rainfall pattern](image)

**Figure 3:** Rainfall pattern during the project period

### Results

- **Study site and Methods**
  - **Location** – Kitui County, southeastern Kenya (map below).
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### Conclusions

- Rainwater harvesting strategies – diverting runoff from roads and collection in trenches enhances and prolongs soil moisture availability.
- *Eragrostis superba* displayed the best response to road water harvesting exemplified by higher biomass yields.
- Combining indigenous grass reseeding and road rainwater harvesting is an innovative strategy to enhance pasture production in African dryland environments.