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.

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; NH_4^+ 1.33 µg g soil; NO_3^- 0.6 µg

g soil; Carbon 0.58 %; Nitrogen 0.05 %; C:N ratio 10.90

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.

Reserved Res 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



EM – *Enteropogon macrostachyus*

CC – *Cenchrus ciliaris*

EM – Eragrostis superba





Results



Fig. 4: Contribution of road water harvesting to soil moisture





Fig. 5: Biomass at transects, T and distance from trench (m)



Fig. 6: Project sites before and after indigenous grass reseeding and road rainwater harvesting

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.









