Potential of combining grass reseeding and rainwater harvesting to combat rangeland degradation in Kenya

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TECHNOLOGIES

Micro-catchments for rainwater harvesting [Kenya]

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Micro-catchments

technologies_2895 - Kenya

EN

TECHNOLOGIES

Grass reseeding [Kenya]

Creation: 05/18/2017 10:04 a.m.   Update: 05/06/2019 2:56 p.m.   Compiler: Kevin Mganga   Editor: –
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Reseeding

technologies_2288 - Kenya

EN   FR

Land degradation in Kenyan rangelands

Some of the causes of land degradation in Kenyan rangelands

- Overgrazing by free ranging livestock ⟶ bare soil

- Climatic factors – droughts and floods ⟶ bare soil + erosion

- Land use change ⟶ soil degradation

- Invasive alien species ⟶ biodiversity loss

Combining sustainable land management strategies to reverse degradation in Kenyan rangelands

Grass reseeding

Cenchrus ciliaris

- Drought tolerant
- Native species
- Perennials
- Forage
- Bulk seeders

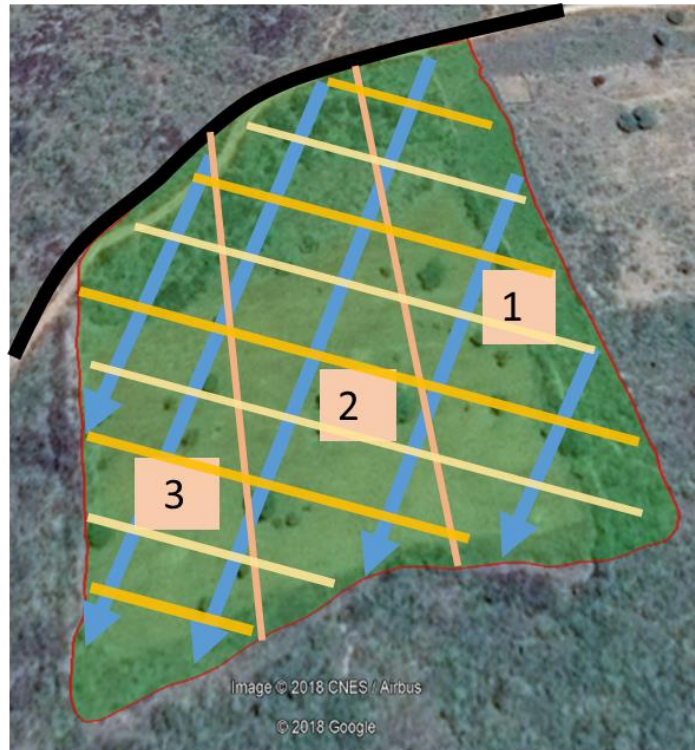*Enteropogon macrostachyus*

Eragrostis superba

Rainwater harvesting
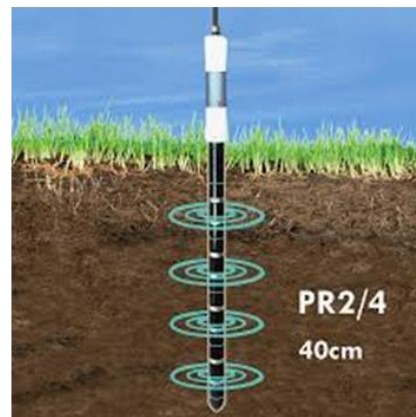
Seedbed preparation - (microcatchments) + trenches
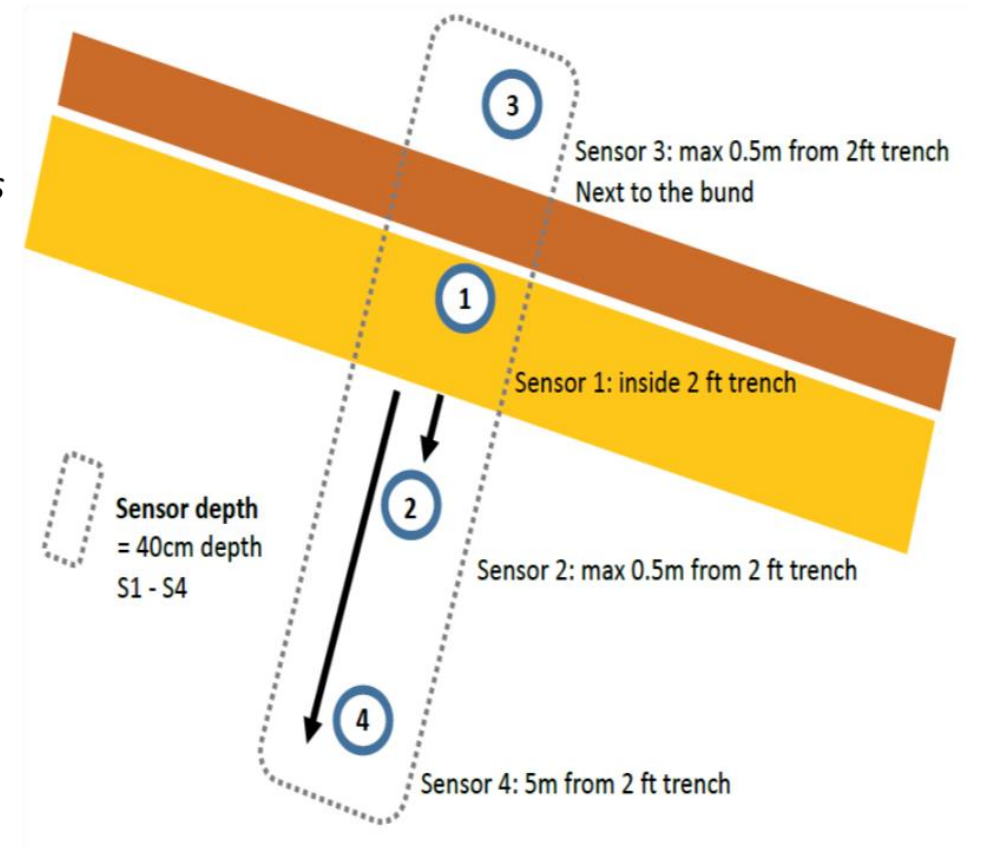
Case study – semi-arid rangeland in Kenya

1 *Eragrostis superba*

2 *Cenchrus ciliaris*

3 *Enteropogon macrostachyus*

→ Slope direction

3 grasses planted
5 contour trenches – connected to road
5 small trenches with bund in between
4 points of soil moisture measurement
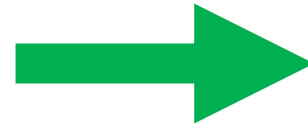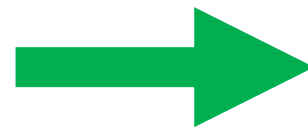
Soil moisture probe

PR2/4
40cm

Sensor 3: max 0.5m from 2ft trench
Next to the bund

Sensor 1: inside 2 ft trench

Sensor depth
= 40cm depth
S1 - S4

Sensor 2: max 0.5m from 2 ft trench

Sensor 4: 5m from 2 ft trench

Soil moisture measurement
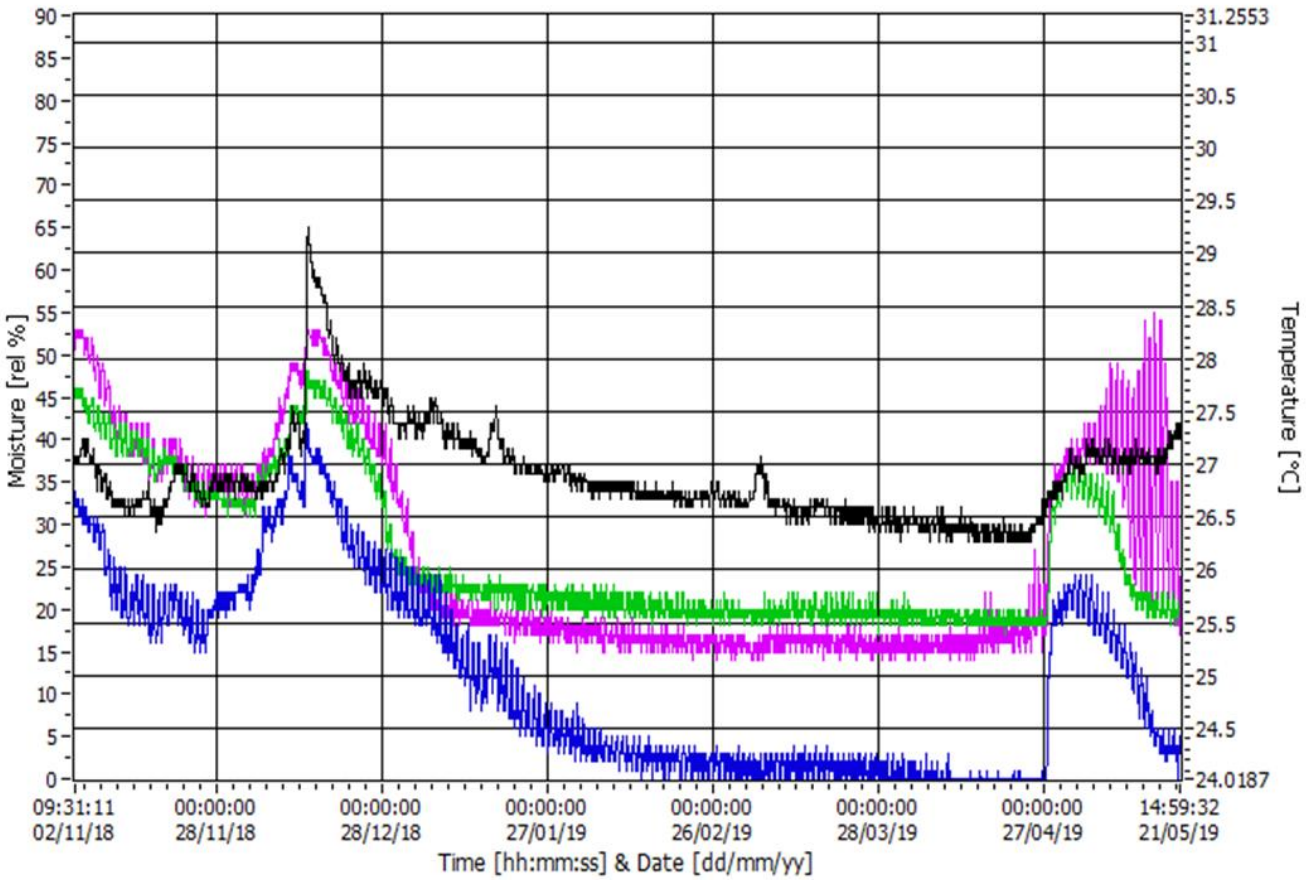
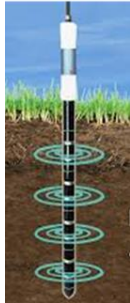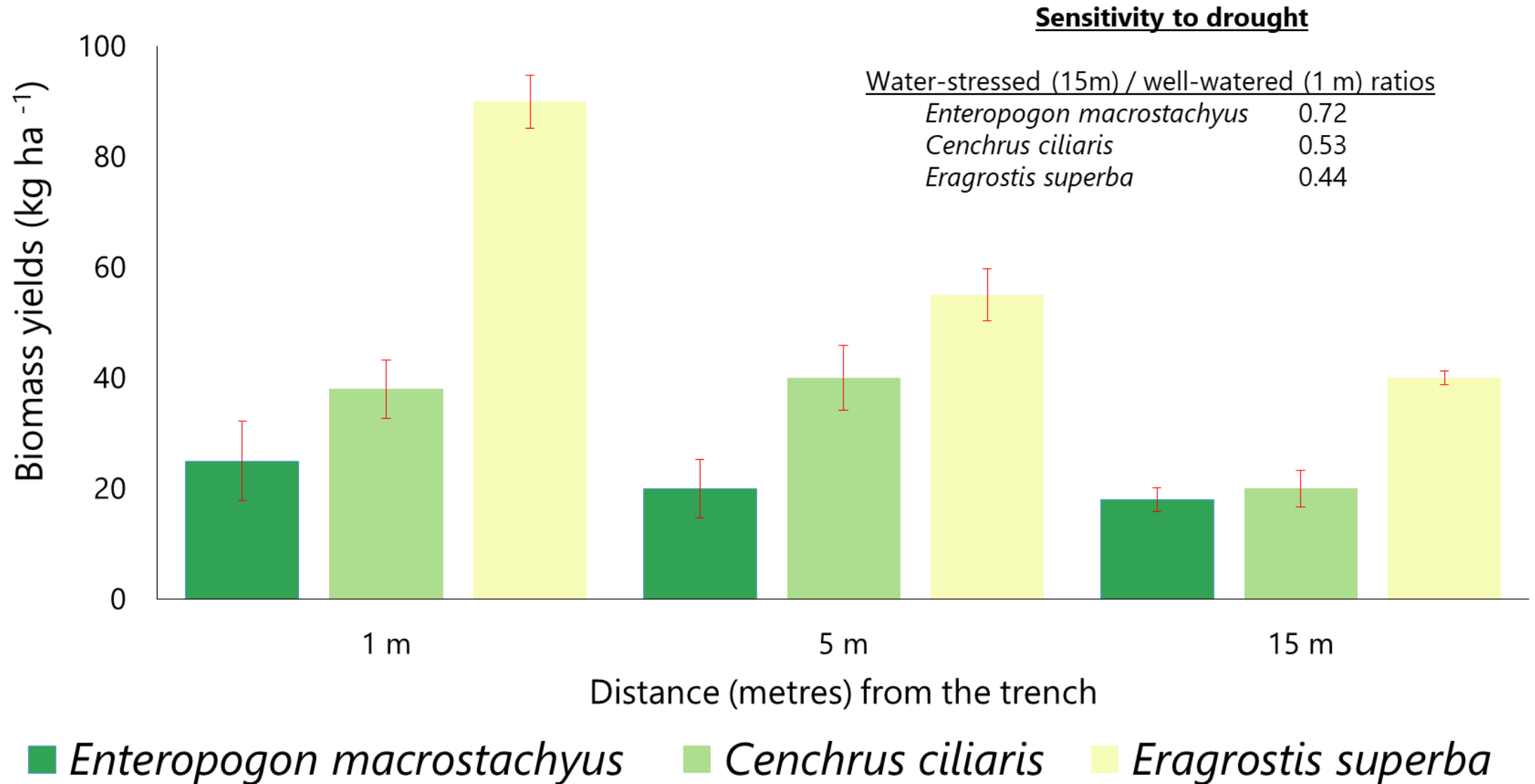# Results - reseeding + rainwater harvesting

Period 8 months

Before

After
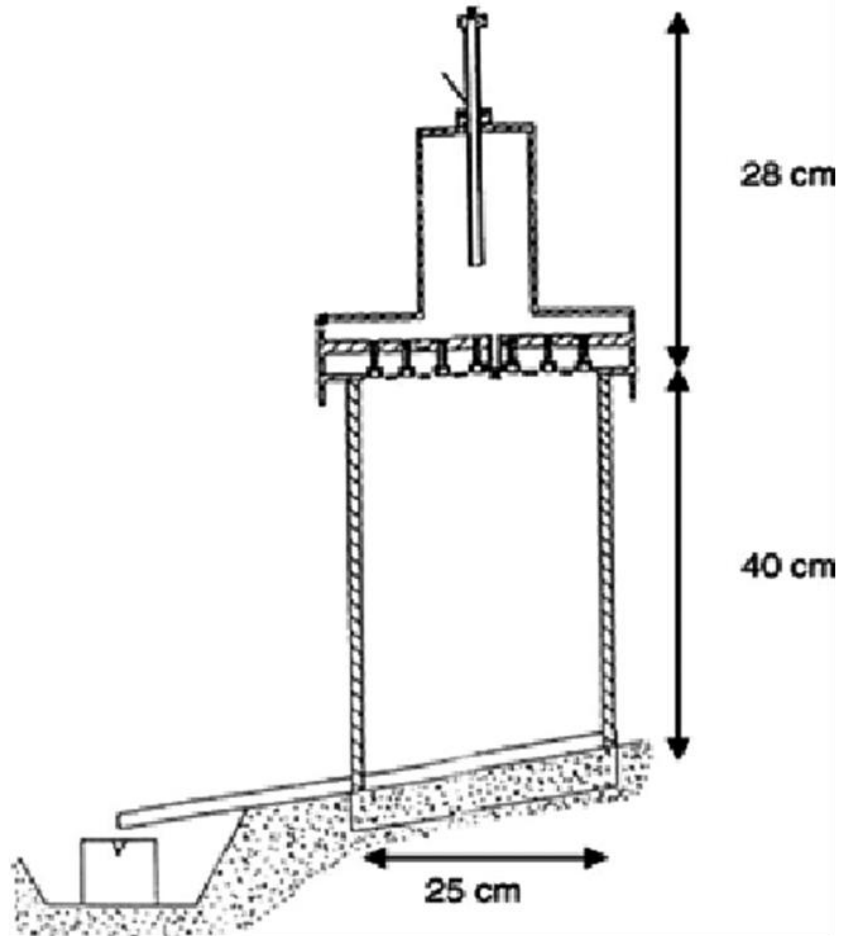
Increase in vegetation cover and soil moisture retention

Inside trench
0.5 m from trench
5 m from trench
Up on the other side of the bund

Biomass yields and distance from the trench

Soil hydrological properties

The Kamphorst Rainfall Simulator: **(a)** a sprinkler with a built-in pressure regulator to produce the standard rain shower; **(b)** an adjustable support for the sprinkler; **(c)** an aluminium ground frame that is placed on the soil and prevents the lateral movement of water from the test plot to the surrounding soil.

Infiltration, runoff and sediment production

A. Infiltration (cm³)
B. Runoff (cm³)
C. Sediment production (g m²)
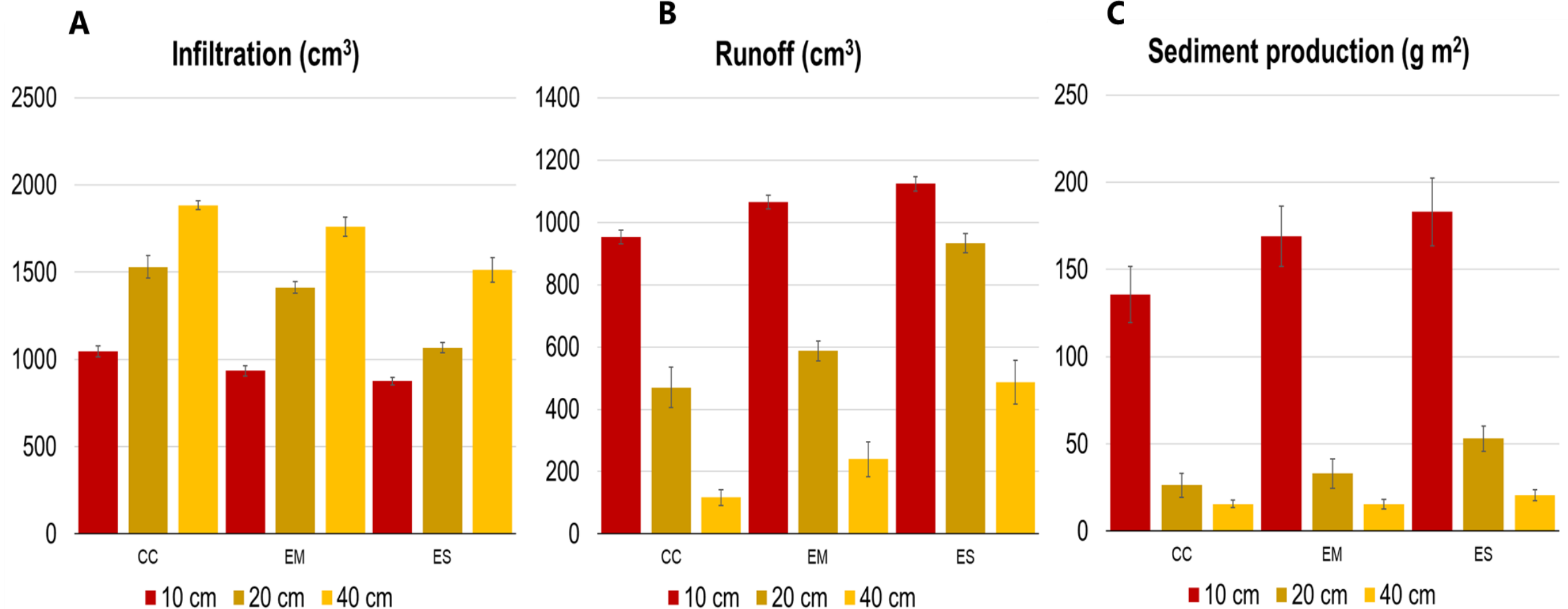
CC – *Cenchrus ciliaris*, EM – *Enteropogon macrostachyus*, ES – *Eragrostis superba*

Success of the grass reseeding and rainwater harvesting in Kenyan rangelands

Target diverse **biophysical** and **socioeconomic** contexts in rangeland systems.

Allow for **adaptation** to specific ecological conditions.

Create avenues for **resilience** amid environmental and climatic changes.

Create a **'win-win' scenario** for the practitioners and rangeland managers.

Acknowledgement