Action research trials on restoration of communal grazing lands

This dataset comprises 3 separate action research trials conducted in communal grazing lands managed by local land management institutions and their membership. The 3 trials are:

1. Short-resting and reseeding (SRRS) of pastoral rangelands in Kajiado County, Kenya
2. Short-resting and reseeding (SRRS) of pastoral rangelands in Wajir County, Kenya
3. Exclosure productivity improvement (EPI) in grazing exclosures in Amhara Region, Ethiopia

1. Short-resting and reseeding (SRRS) trial—Kajiado, Kenya

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A research needs assessment was conducted in 2017, after which a draft action research trial protocol was prepared and circulated to the South Rift Association of Land Owners (SORALO; www.soralo.org). The protocol was finalized in early 2018 following consultation with community members to be directly involved in the research.

The action research trial involved short duration resting of moderately to heavily degraded rangelands for one and two months at the beginning of the "long rains" season of 2018 and the "short rains" season of 2018 and 2019. Nested plots were reseeded with a mix of drought-tolerant rangeland grass species (*Cenchrus ciliaris, Cymbopogon pospischilii, Enteropogon macrostachyus, Eragrostis superba* and *Sehima nervosum*).

Each research location was 5.3 ha in area and was bush-fenced to demarcate the 1- and 2-month resting areas. Spatial cover measurements used LandPKS (www.landpotential.org). Control plots (no resting; grazing as usual) were established 50 m outside the research areas. Baseline measurements were taken in the late dry season before the 2018 long rain, and outcome measurements were taken after the rains in the 2018 long dry season one month after the 2-month resting areas were re-opened to grazing (two months after the 1-month resting areas were opened to grazing); and again after the 2018 and 2019 short dry season.

Dataset file list:
"Kaj_SRRS_metadata.xlsx" — Metadata with site description and definitions of variables and units
"Kaj_SRRS_LR18.csv" — Kajiado long rains 2018 trial data
"Kaj_SRRS_SR1819.csv" — Kajiado short rains 2018-2019 trial data
"Kaj_SRRS.R" — R script with statistical analyses applied to Kajiado trial data

2. Short-resting and reseeding (SRRS) trial—Wajir, Kenya

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A research needs assessment was conducted in 2017, after which a draft action research trial protocol was prepared and circulated to the Wajir County Livestock Production Office of the Wajir County Department of Agriculture, Livestock and Fisheries. The protocol was finalized in early 2018 following consultation with community members to be directly involved in the research.

The action research trial involved short duration resting of moderately to heavily degraded rangelands for one and two months at the beginning of the "long rains" season of 2018 and the "short rains" season of 2018 and 2019. Nested plots were reseeded with a mix of drought-tolerant rangeland grass species (*Cenchrus ciliaris, Cymbopogon pospischilii, Enteropogon macrostachyus, Eragrostis superba* and *Sehima nervosum*).

Each research location had three research areas, each 0.25 ha in area with bush-fences demarcating the 1- and 2-month resting areas. Spatial cover measurements used modified transects comparable to LandPKS

(www.landpotential.org). Control transects (no resting; grazing as usual) were established 20 m outside the research areas. Baseline measurements were taken in the late dry season before the 2018 long rains and outcome measurements were taken after the rains in the 2018 long dry season one month after the 2-month resting areas were reopened to grazing (two months after the 1-month resting areas were opened to grazing), and again after the 2018–2019 short dry season.

Dataset file list:
"Waj_SRRS_metadata.xlsx" — Metadata with site description and definitions of variables and units
"Waj_SRRS_LR18.csv" — Wajir long rains 2018 trial data
"Waj_SRRS_SR1819.csv" — Wajir short rains 2018-2019 trial data
"Waj_SRRS.R" — R script with statistical analyses applied to Wajir trial data

3. Exclosure productivity improvement (EPI) trial—Amhara Region, Ethiopia

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A research needs assessment was conducted in 2016, after which a draft action research trial protocol was prepared and circulated to the Community-Based Natural Resource Management Project (CBINReMP), implemented by Amhara Region Bureau of Agriculture (Amhara BoA). Following consultation with the community members to be directly involved in the research, the protocol was finalized in early 2017.

The action research trial involved several management options for improving the productivity of grazing exclosures, specifically weeding versus plowing and planting two species of improved forages—Desho or Kyasura grass (*Pennisetum pedicellatum*) and Rhodes grass (*Chloris gayana*).

Each research exclosure across eight woredas of Amhara Region had 1–2 research plots of 840 m^2 in area, including controls. The effect of the treatments were measured by comparing biomass production and forage quality (crude protein content and *in vitro* digestibility). Baseline measurements were taken early in the 2017 rainy season and outcome measurements were taken during the early dry season in 2018.

Dataset file list:
"Amh_EPI _metadata.xlsx" — Metadata with site description and definitions of variables and units
"Amh_EPI.csv" — Amhara trial data
"Amh_EPI.R" — R script with statistical analyses applied to Amhara trial data