RESEARCH PROGRAM ON Livestock

More meat, milk and eggs by and for the poor

Restoration action research protocol: End-of-season resting in highland grasslands

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CGIAR is a global partnership that unites organizations engaged in research for a food-secure future. The CGIAR Research Program on Livestock provides research-based solutions to help smallholder farmers, pastoralists and agro-pastoralists transition to sustainable, resilient livelihoods and to productive enterprises that will help feed future generations. It aims to increase the productivity and profitability of livestock agri-food systems in sustainable ways, making meat, milk and eggs more available and affordable across the developing world. The Program brings together five core partners: the International Livestock Research Institute (ILRI) with a mandate on livestock; the International Center for Tropical Agriculture (CIAT), which works on forages; the International Center for Agricultural Research in the Dry Areas (ICARDA), which works on small ruminants and dryland systems; the Swedish University of Agricultural Sciences (SLU) with expertise particularly in animal health and genetics and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) which connects research into development and innovation and scaling processes.

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Introduction

In the Ethiopian highlands, communal grasslands have potential for the contribution of livestock feed sources with sound management plan and improvement methods (Eba and Sircely 2020). Facilitation of management planning for communal grassland user groups was conducted by International Livestock Research Institute (ILRI) researchers in 10 communal grasslands in Menz Gera and Menz Mama woredas in March 2021 (Sircely and Eba 2020a). During the management planning, user groups assessed and planned for the use of land restoration options to improve feed production and reverse degradation in their communal grasslands. Among the restoration options user groups chose for planning, the most frequently selected was 'short-resting' of portions of the grassland during specific months of the year when feasible and effective. The local experience of farmers in resting their individual grazing lands during the peak of the rainy season informed the months during which resting is best conducted in communal grasslands. Resting was most feasible at the end of the rainy season, when farmers primarily graze their animals or feed them hay from their individual grazing lands, and the end of the rains provide good growing conditions for grasses to recover their strength. Since short-resting was the most commonly selected restoration option, user groups who planned to implement short-resting were invited to participate in an action research trial on the effectiveness of resting highland communal grasslands for a brief period of three months from July to September at the end of the rainy season. The short-resting trial 'simulates' how user groups planned to implement short-resting, as part of their larger plans for seasonal resting of grasslands by dividing the area into smaller sections for grazing in different seasons and at different intensities. Seasonal grazing and short-resting are simple and cost-effective from the perspective of communal grassland user groups, and end-of-season resting should substantially improve grass cover, production and regeneration to improve year-round feed availability.

Research goals and roles

Objectives: To improve grass cover, vigour, and production; reduce degradation risk, and thereby improve year-round forage availability in highland communal grasslands.

Hypothesis: Resting communal grasslands for three months toward the end of the rainy season improves grass cover and production, reduces degradation risk, and improves year-round forage availability, in accordance with farmers' local knowledge and experience.

Options to compare: Resting of communal grasslands for three months from July to September, versus no resting (control).

Contexts to compare: Area of grazing land (small vs. large), distance from markets, degree of user group reliance on communal grazing lands for livestock feed.

Study units: Five communal grasslands, each with one research area (Figure 1) containing three resting plots rested for three months, July to September, and three controls plots (without resting). Each resting and control plot is 60 m × 60 m or 0.36 ha (Riginos et al. 2011), and the resting and control areas each total 1.08 ha, for a total research area of 2.16 ha per grassland. Baseline data for each site was collected in the early dry season of 2019 (Sircely and Eba 2020b).

Responses to measure: Plant base cover, woody plant cover, community perceptions/preferences, labour cost, constraints.

Roles of user group members: Identify and decide where research trials will be implemented, delineated/marked with local materials, like wooden page/paint on colour on stone, oversee the area, prepare by-laws for enforcement of the planned options, share experience and evaluate the options. User group members appoint two members of their group to ensure the consistent implementation of the trial.

Roles of others:

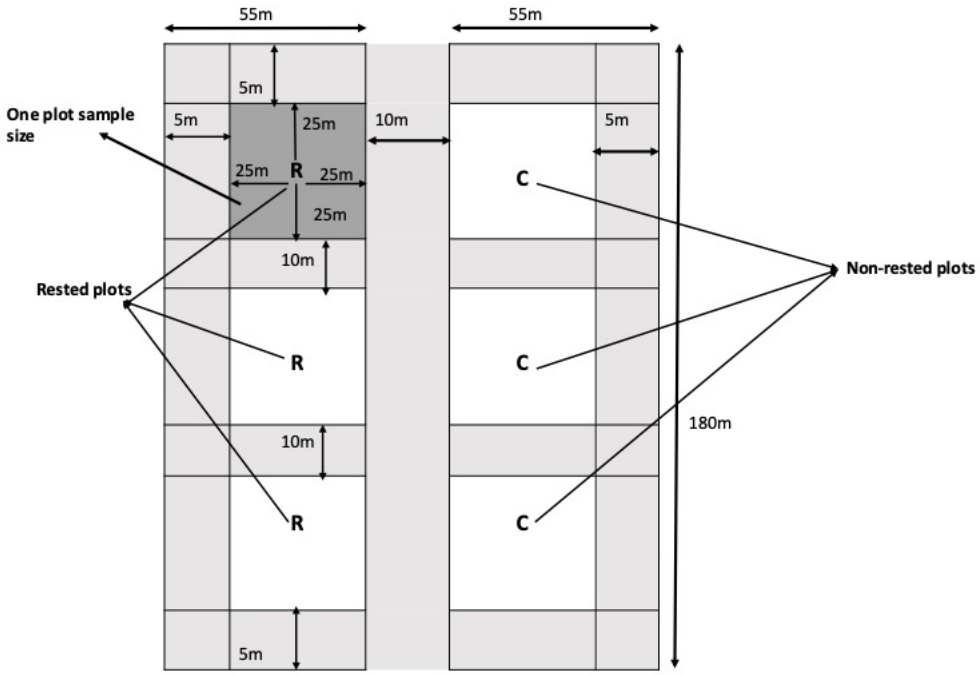
- **ILRI:** Lead the implementation of research trails, prepare the protocol, facilitate the discussion within the community to select the options based on their context, involved in data collection and prepare report. Follow up of the sites during research time, support budget for the activities, prepare the by-laws for enforcement of the planned trial options and translate the plan to local language.
- **Woreda experts (livestock and rural land offices):** Oversee the site and provide feedback and assistance, and involved in research area demarcation, monitor the plots, contribute to evaluation, preparation, translation, and distribution of the by-laws for enforcement of the planned trial options. Mobilizing the community for discussion, selecting sites, and liaison with community user groups.
- **Amhara Regional Agricultural Research Institute (ARARI)/Debre Berhan Agriculture Research Center:** Involved in the process of selecting options, site selection, evaluation, and liaison with community user groups.

Study experimental design

All communal grasslands must be of sufficient size to allow resting (i.e. ≥ 4 ha) with user groups in agreement to host the research on resting.

Suggested timing (start and end): Plots established and baseline taken in a prior year in the early dry season (peak standing biomass). Resting starts at the end of the wet season, for three months, July–September. Assessment of outcomes from the trial will be in October or November, in the early dry season.

Figure 1. Design and layout of action research trial resting and control plots.



Procedures for implementation

Preparatory activities

Each communal grassland needs to be characterized, have its prioritized objectives set, and its management planning completed. These steps are taken to understand and identify resources use and access, the objectives of users group, and to ensure that the management option of short-resting is a part of the user group's plan for better management of their communal grassland.

Action trial implementation

Step 1. Five communal grasslands that represent the communal grasslands in Menz were selected according to willingness of the user group and the inclusion of short-resting in their management plan. Three treatment (resting months) and three controls plots within each communal grassland were demarcated with GPS.

Step 2. Baseline data were collected with the community and national agriculture research centres involvement using Land PKS (Riginos et al. 2011).

Step 3. The community decided how to protect the action research area during the resting time, and hence nominated two people to keep the area secure for three months with a stipend as compensation. User groups selected two guards through discussion for each site and each guard signed a contract for three months of a modest monthly payment. While fencing may be required in some cases, here protection by community members was seen as more feasible. All members of the user group had the responsibility to protect and oversee the action research areas.

Step 4. Resting for the action research trials started on 7 July 2021, and will end on 7 October, for the months of resting at the end of the rainy season.

Step 5. At the end of resting, community focus group discussions will be held with the user groups to evaluate the results of the action research trials. Woreda experts and the Amhara Regional Agricultural Research Institute (ARARI) will be involved.

Step 6. Outcome data collection will be carried out with ARARI of Debre Berhan Agriculture Research Center, in the early dry season in October or November. The results will be analysed statistically by ILRI researchers.

Materials needed: GPS, tablet with LandPKS app installed, 1-metre wooden stick, notebook, 20 sticks of 0.5 metre length and colour paint for demarcation of the research area in each site.

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