Improving grazing exclosures to enhance livelihoods in Amhara region, Ethiopia through research-in-development collaboration

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Background

- A combination of ineffective grassland management, population pressure, and the break-down of customary rules have led to the degradation of communal lands in the Ethiopian highlands. This has put the much-needed livelihood and environmental benefits of communal lands at risk.

- This trend attracted government and donor attention. The Community-Based Integrated Natural Resources Management Project (CBINReMP), implemented by implemented by Amhara Bureau of Agriculture and Rural Development (ABoA), and the nationwide Sustainable Land Management Program (SLMP) are examples of such interventions.

- Both programs establish grazing exclosure areas, with soil and water conservation structures to enhance rehabilitation. Initiatives oriented primarily around conservation are at risk of failure, as they may be unsustainable unless they provide significant benefits to livelihoods.

Options by context

- Seeking to add value to previously rehabilitated exclosures, CBINReMP (ABoA) and ILRI have implemented a 'research-in-development' approach applying the 'options by context' concept. The project compares four forage improvement options on 30 exclosure sites in the Mirab Gojam and Awi zones of Ethiopia. Site contextual factors vary, including: altitude; distance from market; soil type; exclosure area; beneficiary population; and utilization arrangements.

- Experimental implementation was designed to study the exclosure treatment options: (a) removal of unwanted species; (b) removal with re-planting of preferred species; and (c) ploughing with planting of improved forages.

- Using focus group discussions (FGDs), information was collected on useful/wanted and not useful/unwanted exclosure plant species, the utilization patterns and arrangements of the community, and seasonal feed availability and shortages. The discussions indicated the high potential of the treatments. Farmer preferences for removal of unwanted species revealed information that may enable prediction of the relative success of the planned treatments.

- Future household surveys will document the current feed situation and set a baseline data for comparison over time. Experimental implementation of exclosure improvement will begin at the onset of the 2017 *kiremt* or main rainy season.


Figure 1. Local knowledge on exclosure management. Farmers hold up unwanted or 'weedy' exclosure plant species in their left hands, and hold preferred forage species in their right hands.

Early research results

- FGDs with farmers (Fig. 1) documented local knowledge on plant species found in exclosures, including unwanted or 'weedy' species to remove, and preferred forage species to keep.

- Key to this research are contextual factors (Fig. 2) likely to affect the success of different exclosure treatments. Treatments replicated across all contextual factors enable context-specific recommendations.

- *Context matters!* Farmers with larger exclosures more often wanted to remove low-quality grass species and replace them with higher-quality local forages (Fig. 3), while farmers with smaller exclosures did not want to remove any grass.

- *Why is this information useful?* Forage scarcity is likely less severe in areas with larger exclosures (partly due to less local degradation), leading farmers to focus on improving the *quality* of biomass. In areas with smaller exclosures, the priority of farmers was a greater *quantity* of biomass.
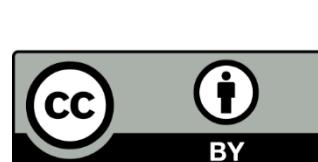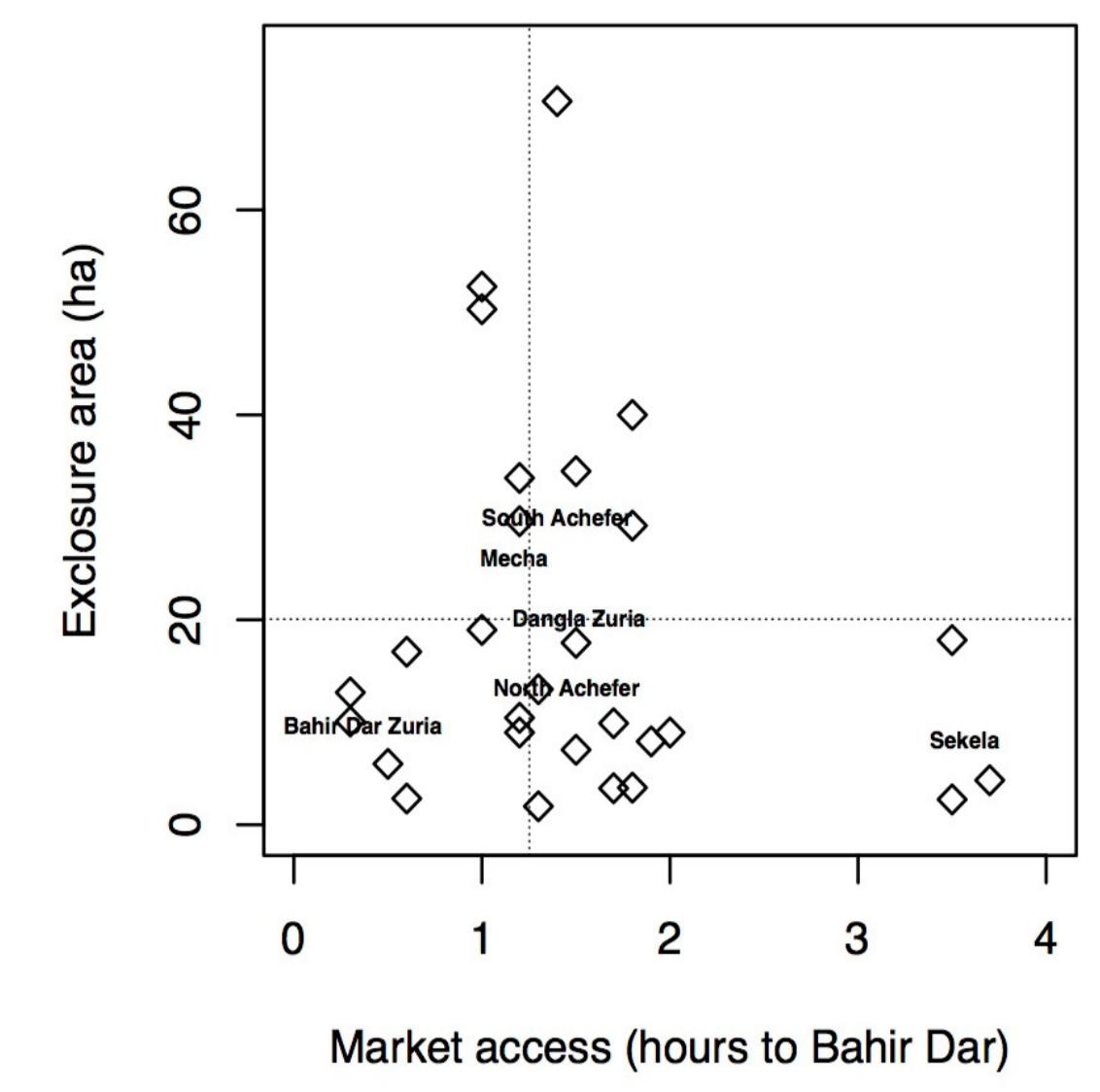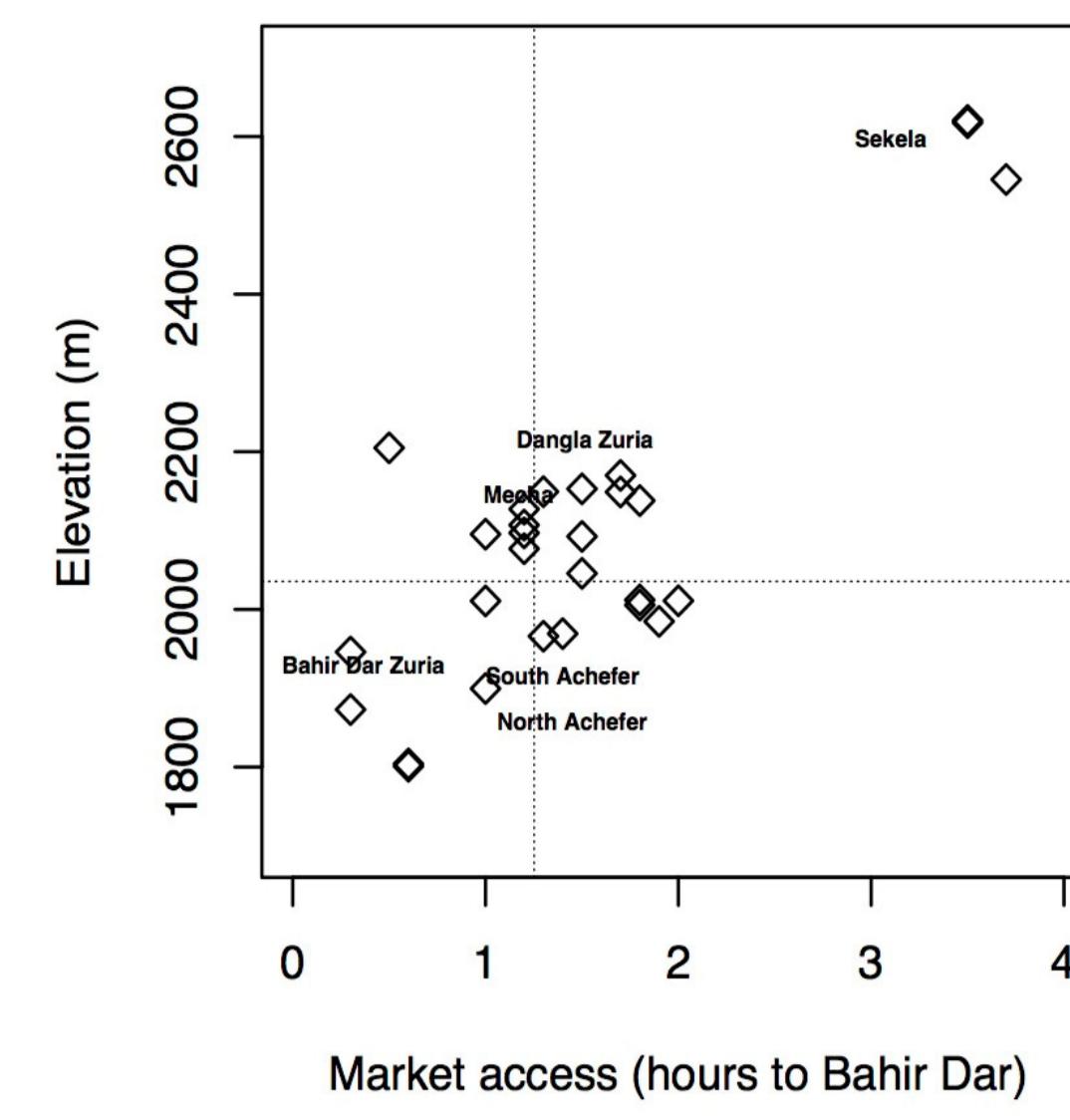
Table 1. Correlations (Pearson's *r*) for key contextual variables among exclosures

|	Area (ha)	Elevation (m)
Without highlands >2500 m		
Elevation (m)	-0.082	—
Market access (hours to Bahir Dar)	0.046	*0.416
All woredas		
Elevation (m)	-0.219	—
Market access (hours to Bahir Dar)	-0.156	***0.833
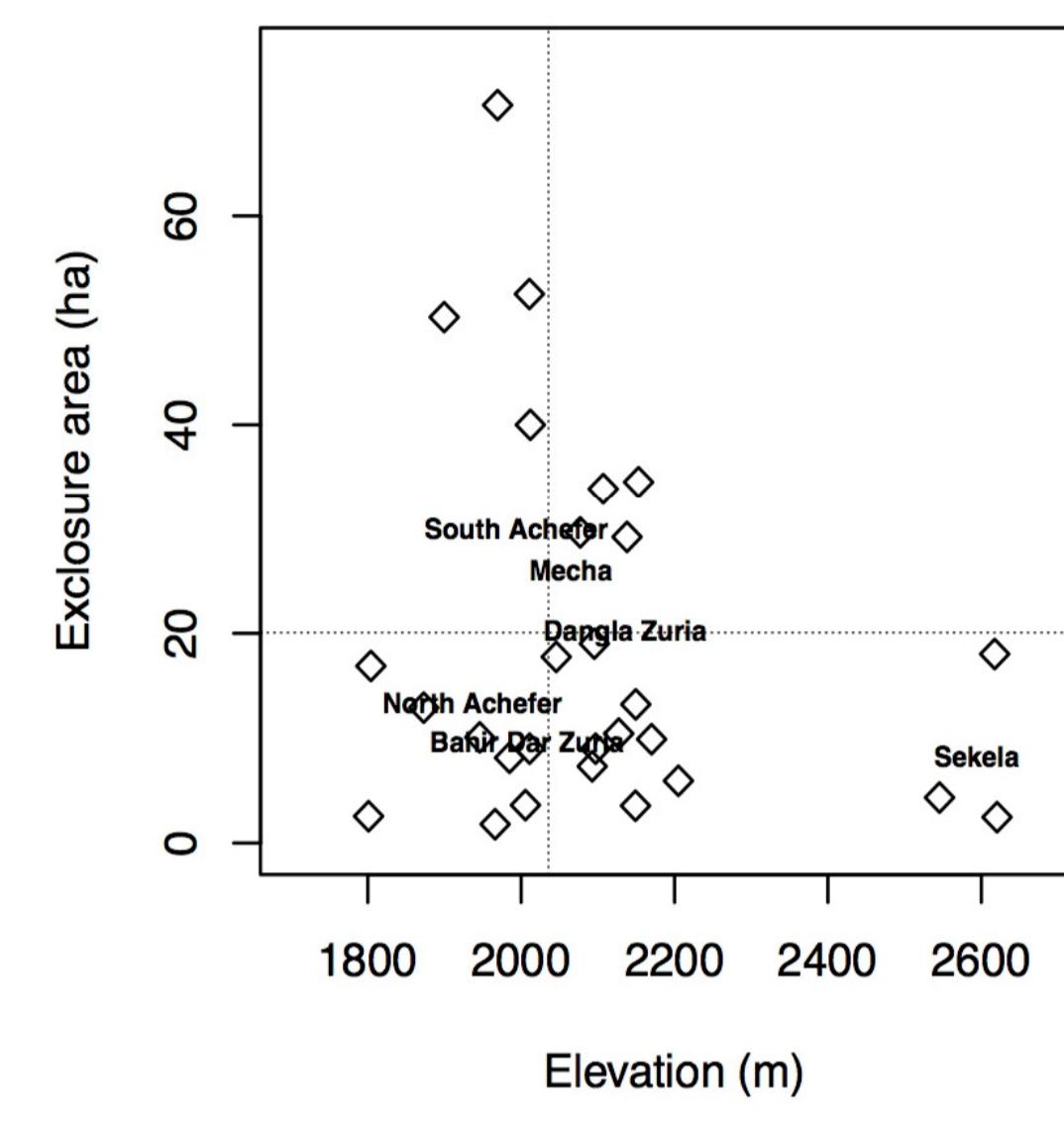
Figure 2. Relationships among contextual variables hypothesized as influencing exclosure improvement options: elevation, exclosure size, and market access (hours of travel time to Bahir Dar as proxy). Dashed lines are means for all sites except for highland sites > 2500 m (Sekela woreda).
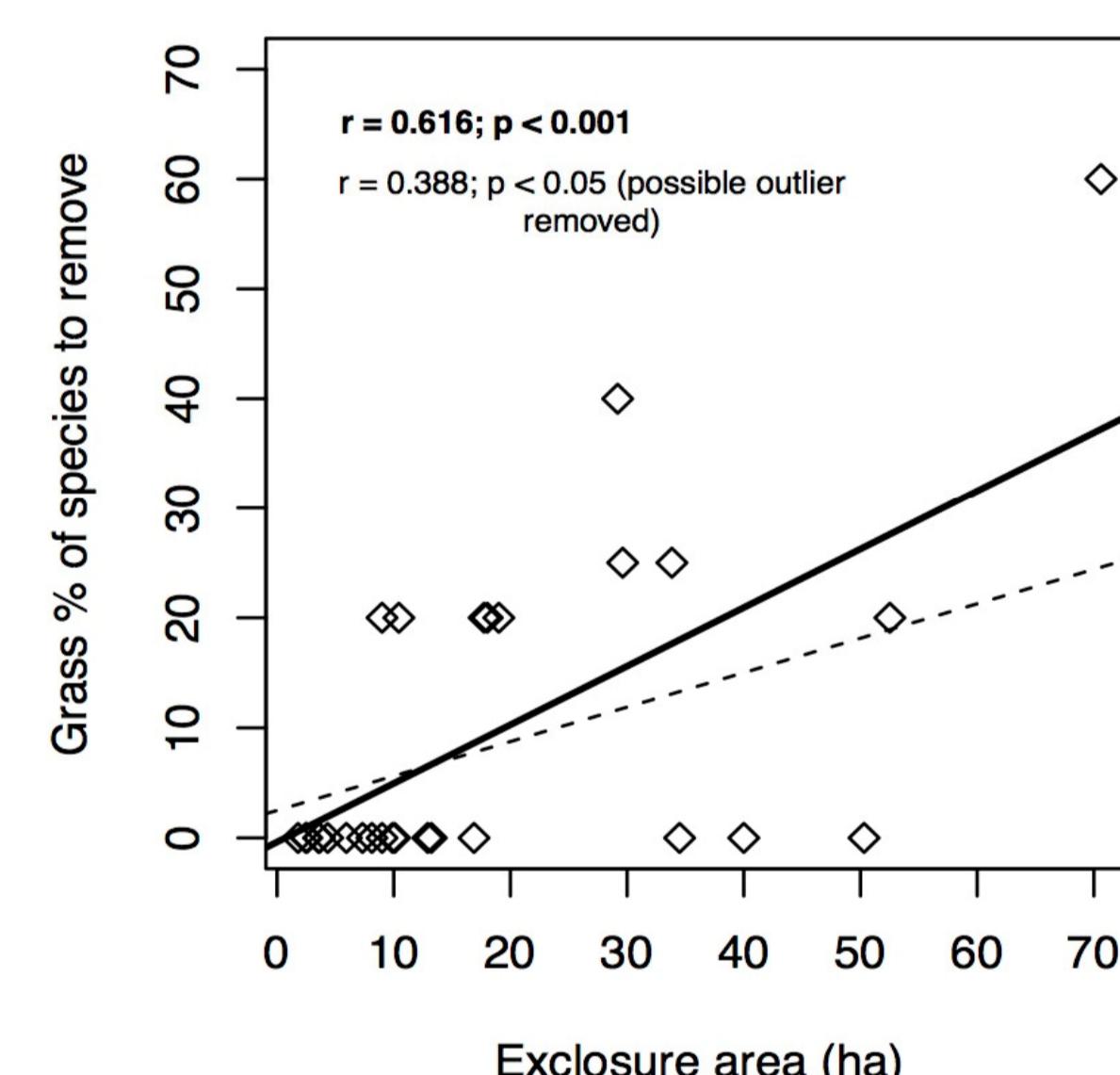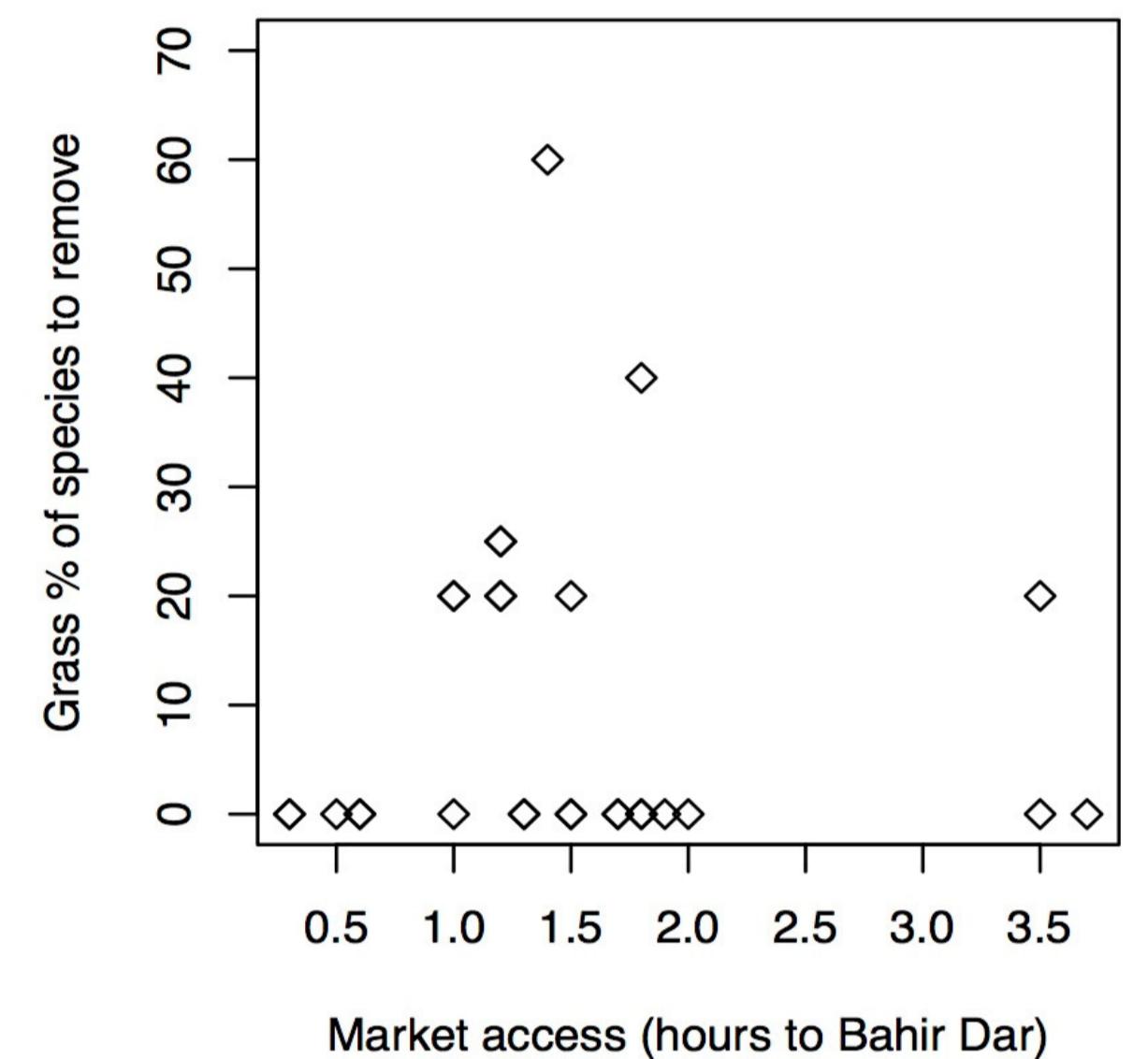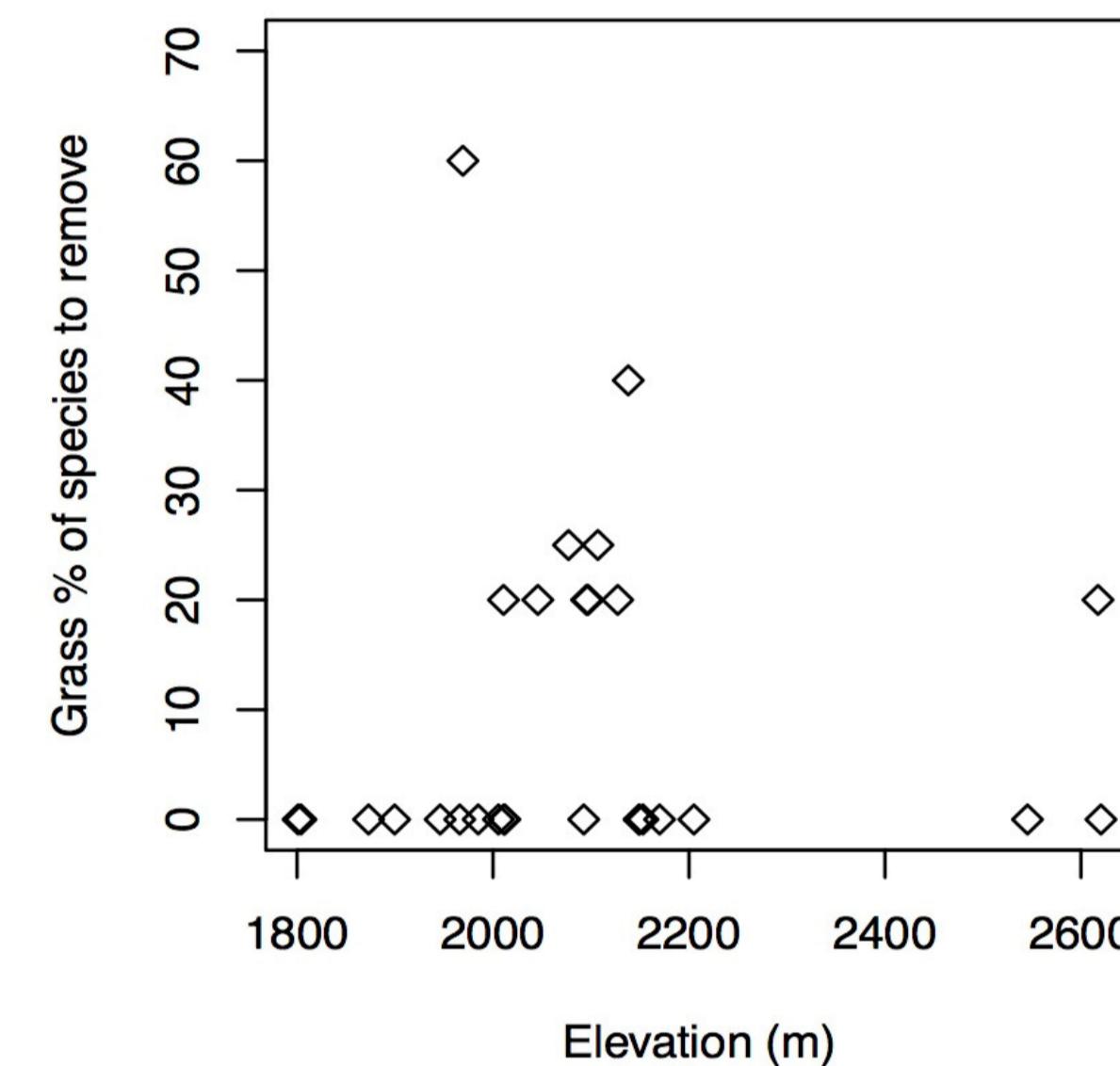

Figure 3. Variation in farmers' desire to remove grass species with contextual factors. Grass % of species to remove (the percentage of plant species farmers want to remove that are grass species) was significantly correlated with the area (size) of grazing exclosures (but not elevation or a proxy for market access).

Conclusions

- These initial results demonstrate that local knowledge of farmers aligns with livestock feed science recommendations, and carry the significant messages that:
  - (*i*) different options are likely to succeed in different contexts, and
  - (*ii*) local farmer knowledge should be leveraged to design forage improvement strategies.

- Discussions with farmers indicated significant potential of the experimental treatments to improve forage yield and quality.

- Farmers were highly supportive of the research, and often offered ideas on different treatments that assisted the research, including selection of improved forage species such as *Chloris gayana*.

- Research-in-development is a promising approach, because research is conducted collaboratively with development projects and programs.

- New development partners implementing land restoration in challenging contexts are welcomed, and our tools and approaches for exclosure improvement are freely available.

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