Utilisation of alpine rangelands by yaks and small ruminants in Gilgit-Baltistan, Pakistan

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Materials & Methods

- Valleys (Fig. 1): Chapurson (C), Haramosh (H), Khaplu (K)
- Focus groups (FG) discussions: n = 3, 4, 3 FGs in C, H and K, with 5-8 herders, during 05-08/2018. Data obtained for 2017 on herds, herding tasks, pasture use.
- Participatory mapping: per season, FGs delineated grazing areas of yaks (Y) and small ruminants (SR) on geo-referenced Google Earth images.
- Sheep units (SU): calculated from animal numbers and age categories.
- Stocking densities (SU*d/ha): computed per valley for seasonal pastures, at species level and for jointly grazed areas.
- Lightly and heavily stocked areas were defined as pastures grazed by <25% and >75% of a valley’s Y & SR population and their area calculated.

Introduction

- Livestock keepers in Gilgit-Baltistan, North Pakistan, face steep topography, harsh weather and limited fodder availability on Karakoram rangelands.
- Environmental adaption shapes their herds’ composition, grazing decisions, and herd movements.
- Recent policies improved economic activities and employment options within and beyond the region.
- Combined with climate change effects, this development may put rangeland management at risk.

To identify potential threats to sustainable rangeland utilisation, we explored herd sizes, herd composition, herding strategies, and stocking densities in three valleys practicing group herding of yaks, sheep & goats.

Results

- Mean (±SD) yak herd sizes in C, H and K were 12±4.3, 30±9.4, and 15±2.2; small ruminant herds comprised 28±10.4, 139±41.3, and 76±24.5 animals.
- Winter & spring pastures were close to and summer pastures farthest from villages. Yaks (Fig. 2) grazed higher- and SR mid-altitude rangelands.
- Full-time or part-time herding and unattended grazing varied with season, species, and valley (Fig. 3).
- Across species and seasons, stocking densities (SU*d/ha) ranged from <0.1 to >6.5; stocking densities tended to decrease when flocks were partly or fully herded on the alpine pastures (Fig. 4).
- Despite species-specific pasture allocation, overlap of Y & SR grazing led to sizable shares of highly stocked areas in spring and summer (Tab. 1).

Conclusions

- Herding of yaks and small ruminants tends to reduce stocking density and in consequence grazing pressure.
- Group herding is an often implemented strategy to lower workload of individual herders and free time for other activities.
- Guiding herds on pasture in early morning and bringing them back in late afternoon (part-time herding) does not increase stocking densities beyond those of full-time herding but reduces workload.
- Sustainable rangeland management in Gilgit-Baltistan could be fostered by consistently implementing labor-saving strategies.

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Tab. 1: Share (%) of heavily (HS) and lightly (LS) stocked1 spring and summer pasture areas in the study valleys.

<table>
<thead>
<tr>
<th>Valley</th>
<th>Spring</th>
<th>Summer</th>
<th>Spring</th>
<th>Summer</th>
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<tr>
<td></td>
<td>HS</td>
<td>LS</td>
<td>HS</td>
<td>LS</td>
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<td>Khaplu</td>
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<td>15</td>
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1 for definition see Materials & Methods; n.a.: not applicable.