

Institutional Arrangements and Livestock Mobility in Communal Rangelands: Evidence from Kavango East and Omaheke, Namibia

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Background

- Namibia's communal rangelands support (agro-) pastoral livelihoods
- Resource governance and grazing management differ among the study sites:
 - Kavango East: Agro-pastoral systems, crops and livestock share the same space
 - Omaheke: Pastoral system with free grazing livestock
- Factors shaping livestock mobility in the two systems remain poorly understood

Research questions:

How do grazing and water access arrangements differ between Kavango East and Omaheke?

How does cattle mobility change between herded and non-herded periods in each region?

Conclusion

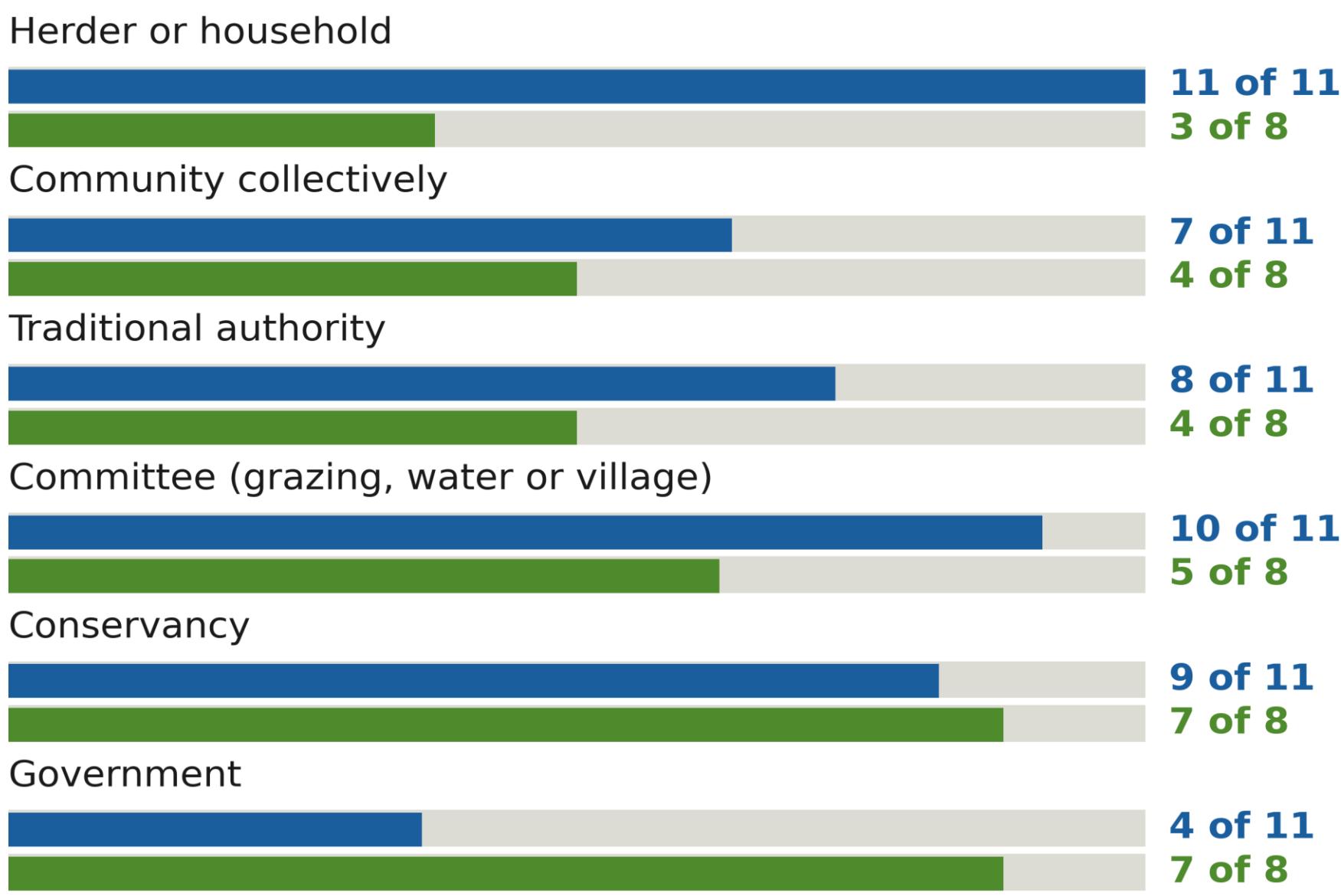
- In both regions, livestock mobility is shaped by multiple actors involved in managing access to rangeland resources.
- Both regions have established arrangements for managing rangeland resources, but these differ in what they regulate.
 - In Kavango East, the crop calendar constrains cattle movement seasonally, with cattle ranging further when not herded during the dry season.
 - In Omaheke, movement is constrained by fences and access to water, with cattle ranging substantially further from their kraals when not herded.
- Cattle mobility patterns respond differently to herding and non-herding practices across regions, highlighting the role of local resource-use arrangements.

Results

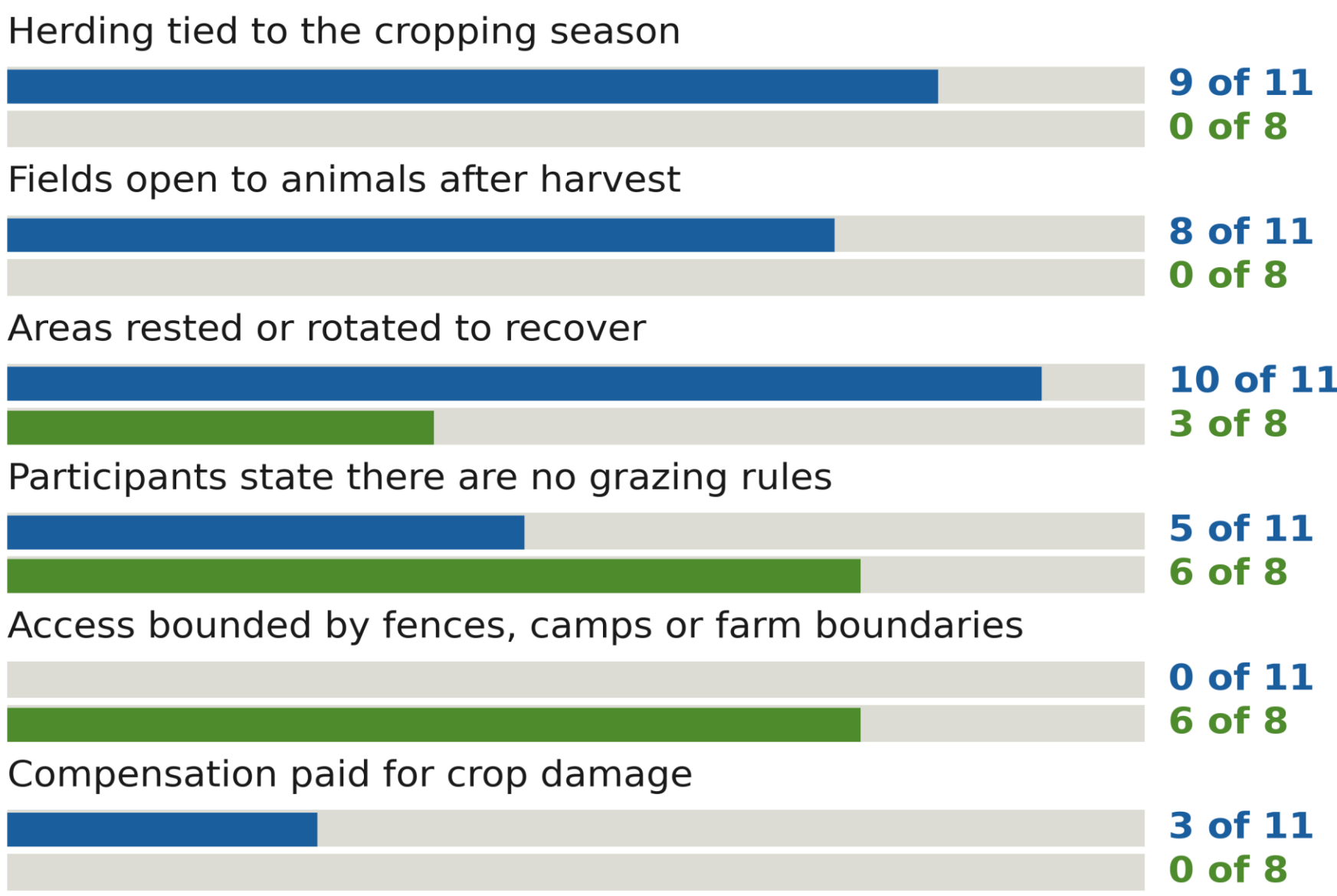
1. Governance arrangements differ across the two regions

Kavango East (11 villages) **Omaheke (8 villages)**

Actors involved in governance



Grazing management



Water access

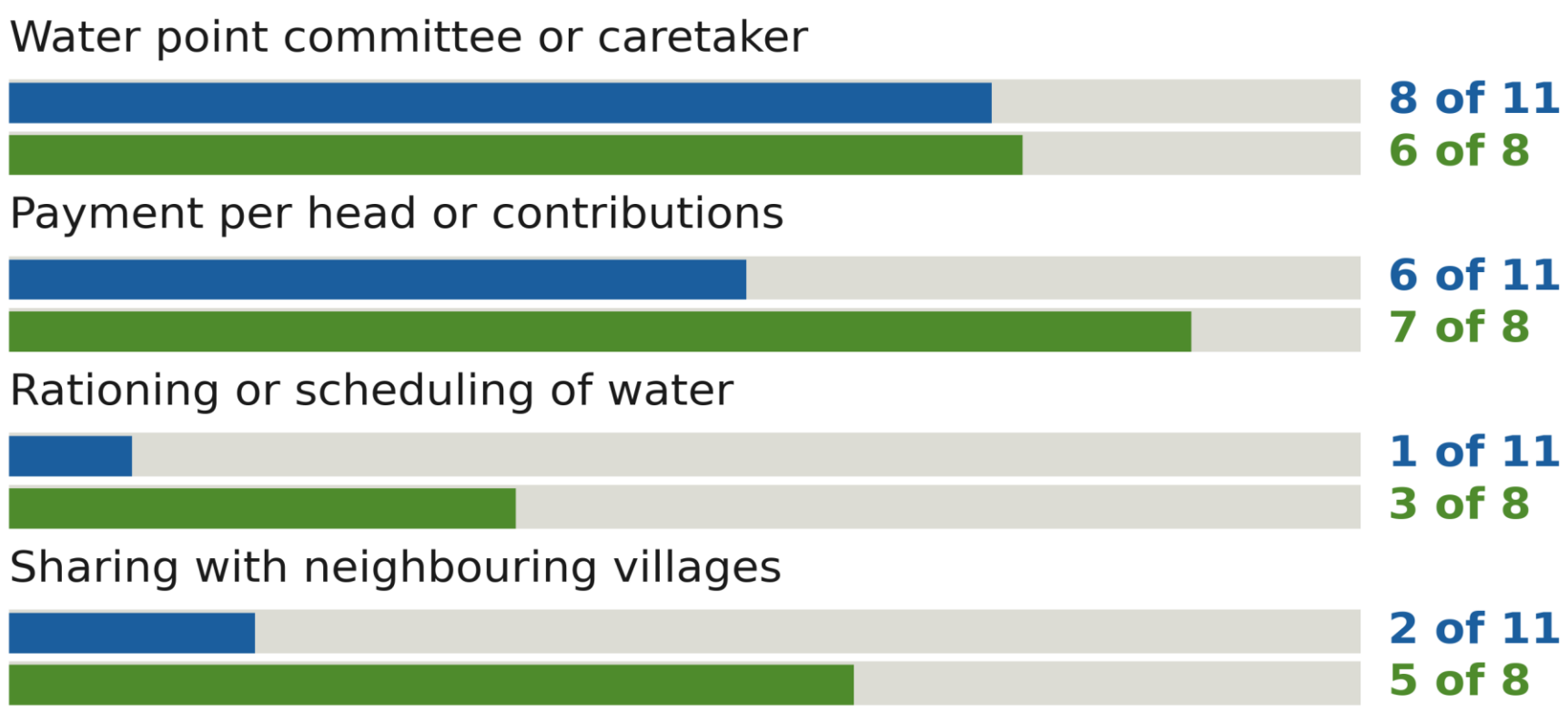


Figure 1. Frequency of themes mentioned across villages.

Note: Bars show the number of villages in which each theme was mentioned, based on village transcripts.

2. These arrangements create different constraints on when and where cattle can move



Picture 1: Collared cattle in Omaheke

3. GPS tracking reflects these differences in observed daily mobility patterns

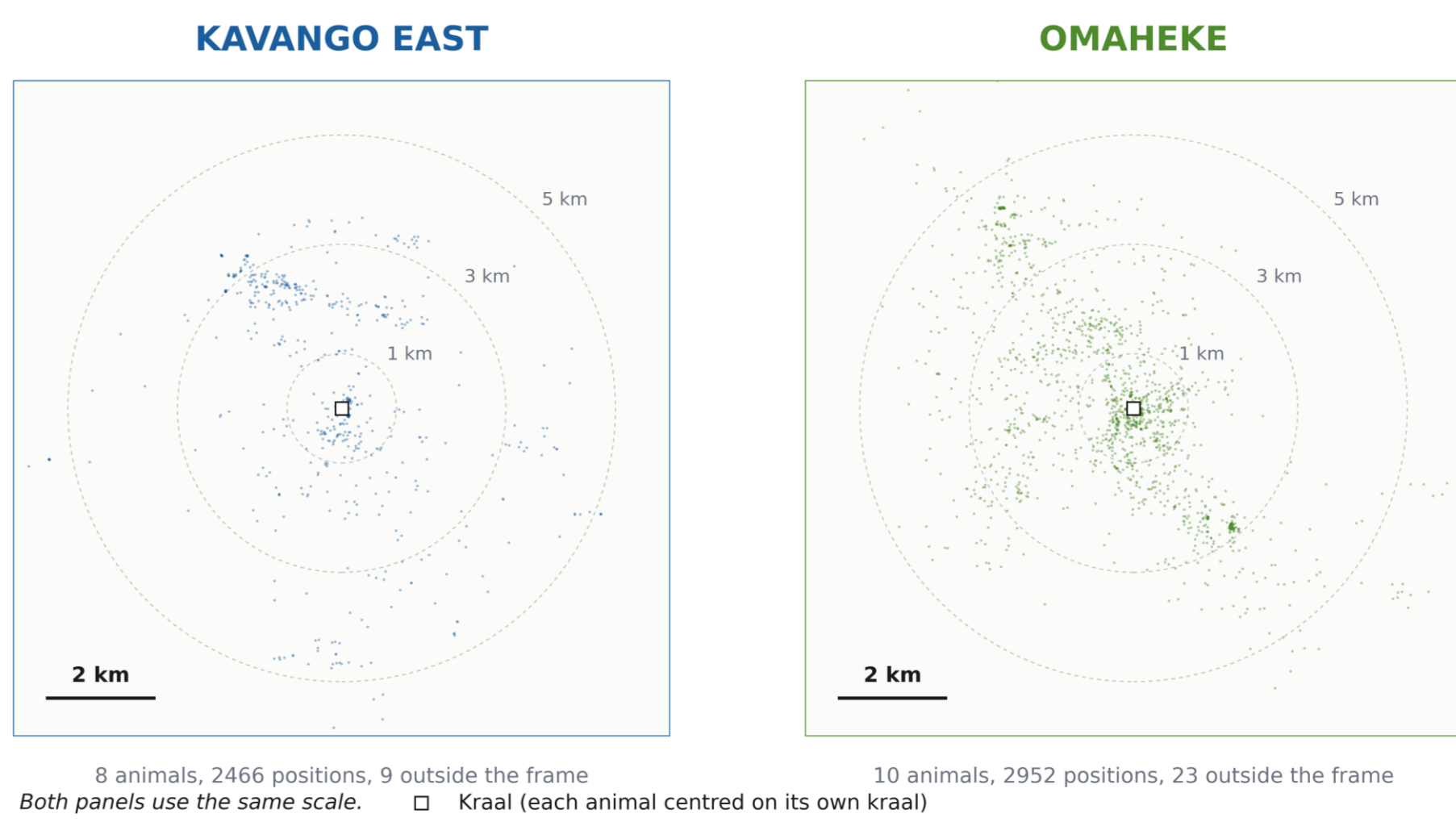


Figure 2. Recorded GPS positions relative to each animal's own kraal. Both panels use the same scale.

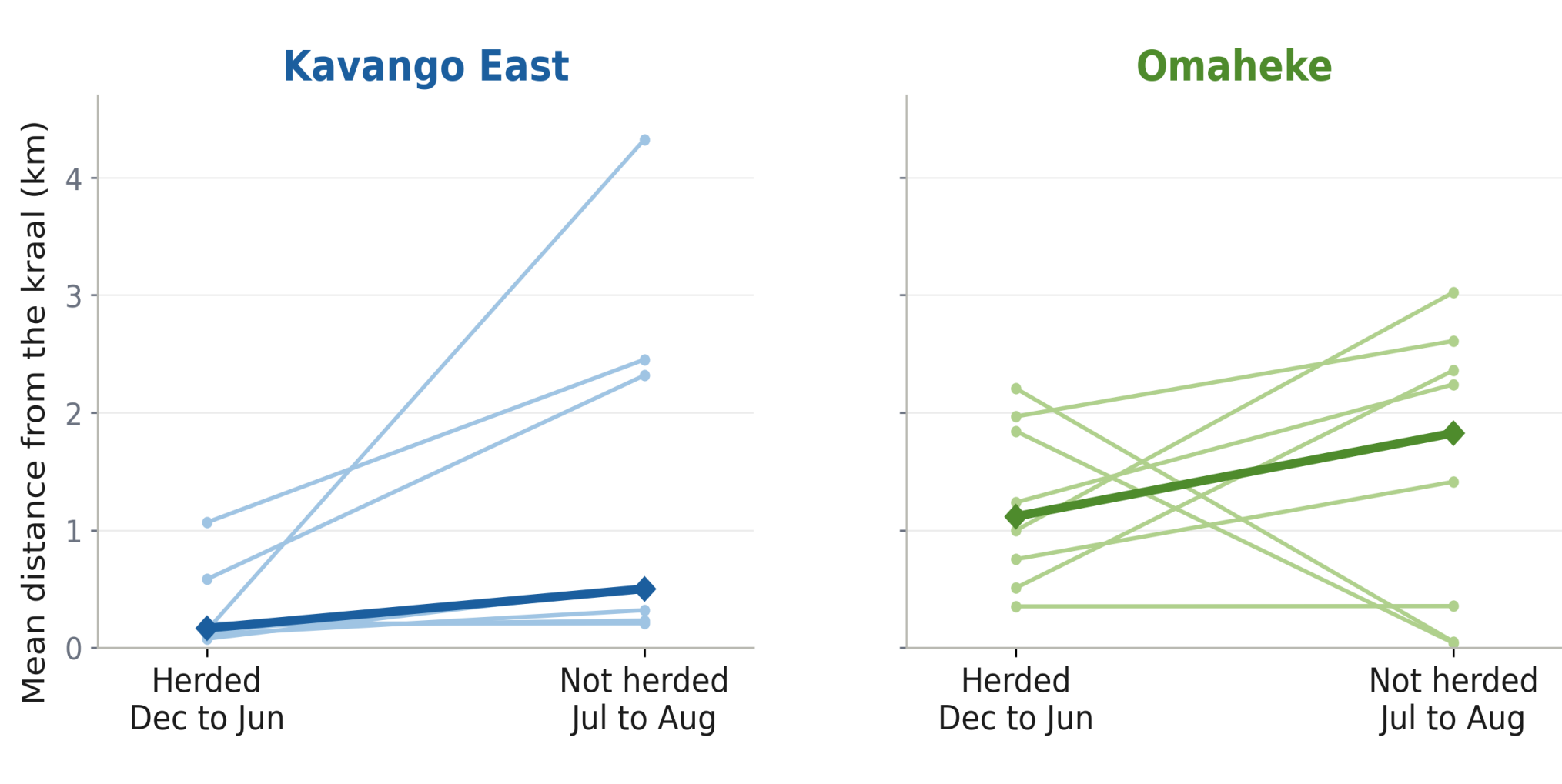


Figure 3. Mean distance from the kraal per animal during herded and non-herded periods.

Table 1. Distance from the kraal over 222 tracking days (16 January–25 August 2026), covering the rainy and cold dry seasons.

	Kavango East	Omaheke
Collared cattle analysed	8	8
Mean km from the kraal, herded (Dec–Jun)	0.17	0.12
Mean km from the kraal, not herded (Jul–Aug)	0.50	1.83
Km from the kraal at night (median)	0.05	0.77
Furthest point reached, km	6.8	6.7

Note: Data based on 5,012 GPS data points from 16 collars

Cattle mobility during herded and non-herded periods: **Kavango East:** herded vs. non-herded → **Significant, p = 0.008** **Omaheke:** herded vs. non-herded → **Not significant, p = 0.55**

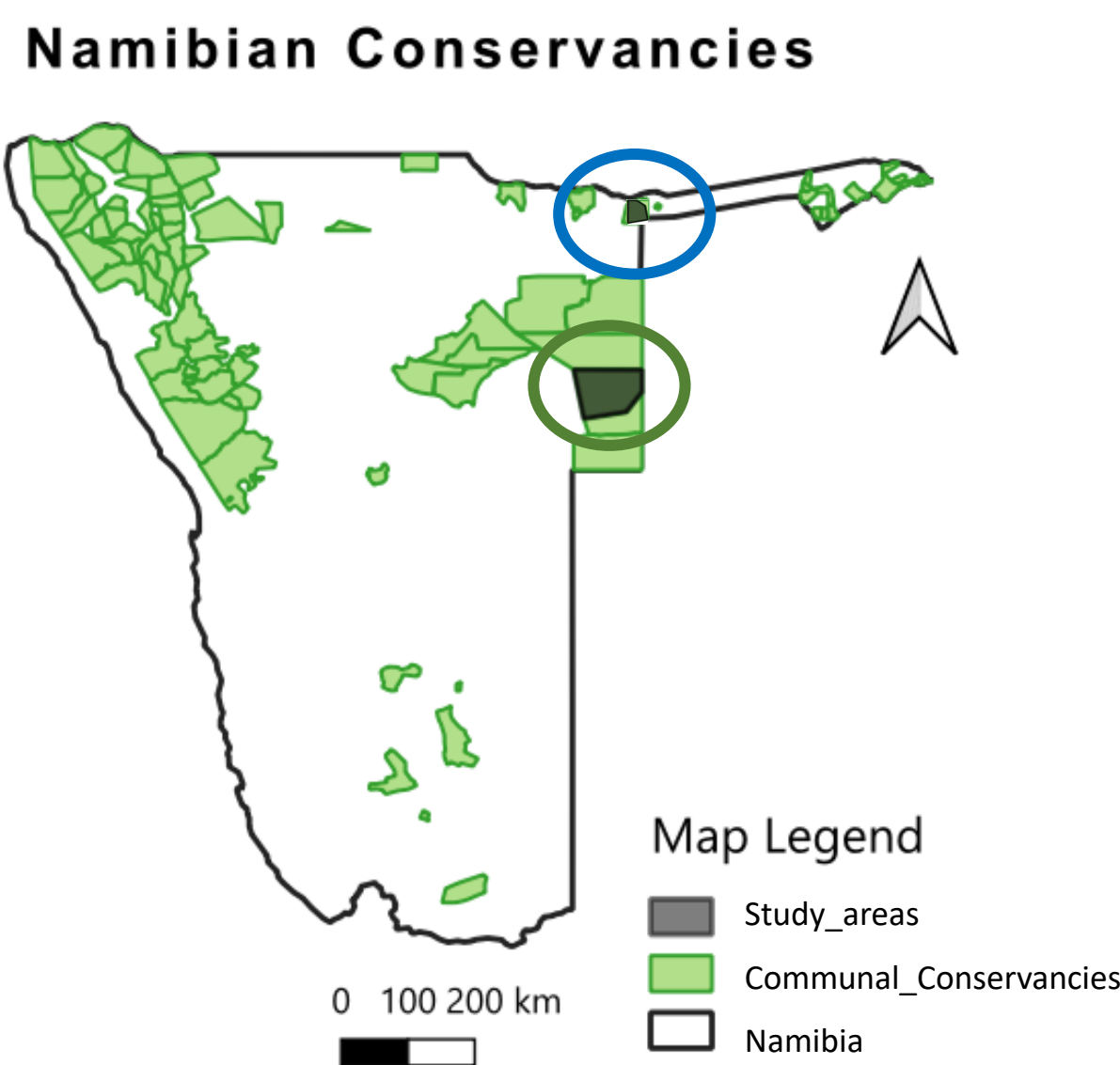
Study area

Kavango East Region: Muduva Nyangana & George Mukoya Conservancies

- Woodland savannah
- Mixed cropping and livestock
- Movement constrained by Khaudum National Park and wildlife-only areas

Omaheke Region: Eiseb Communal Conservancy

- Kalahari sandveld rangelands
- No crop fields, only backyard gardens
- Movement bounded by fences and restricted by veterinary disease-control measures



Methodology

- Participatory Net-Mapping (n = 28): Kavango East 15, Omaheke 13
- Village transcripts (n = 19): Kavango East 11, Omaheke 8
- GPS data: 16 Ceres collars (8 per region), measuring distance from each animal's kraal (UTM 34S)



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Funded by:



Federal Ministry of Research, Technology and Space



Tropentag 2026