

Grazing Management on Communal Land in Northern Namibia: Information, Decision-Making and the Role of Digital Tools

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Background

Agro-pastoral systems sustain millions of livelihoods across semi-arid regions.

Herders rely on diverse sources of information to make strategic grazing decisions.

Poor decision-making derived from lacking information, can lead to livestock losses, reduced productivity and declining livelihood security.

Research gap: Little is known about the information used and shared for grazing management in northern Namibia.

Research questions:

- How do agro-pastoralists integrate and exchange information for grazing decisions?
- How can digital and communication technologies support these decisions?

Conclusions

For grazing decisions, 16 information types were identified across three categories: Environmental, socio-Institutional and livestock related; plus personal preferences.

Existing information system (sources, exchange channels and information content) operates with limitations associated to timeliness, geographic reach and accessibility.

Digital technologies show potential to improve information exchange on livestock health, wildlife conflict and forage condition, if local use constraints are addressed.

Recommendations for future initiatives: Strengthen adaptive decision-making -> Enable more integrated information systems -> Co-design of digital tools.

Results

Seasonal Grazing Strategies

Dry Season: May - October

Start of season (May - June): Crop field grazing

Mid-season (July - October): No Herding, guided free grazing, herd splitting

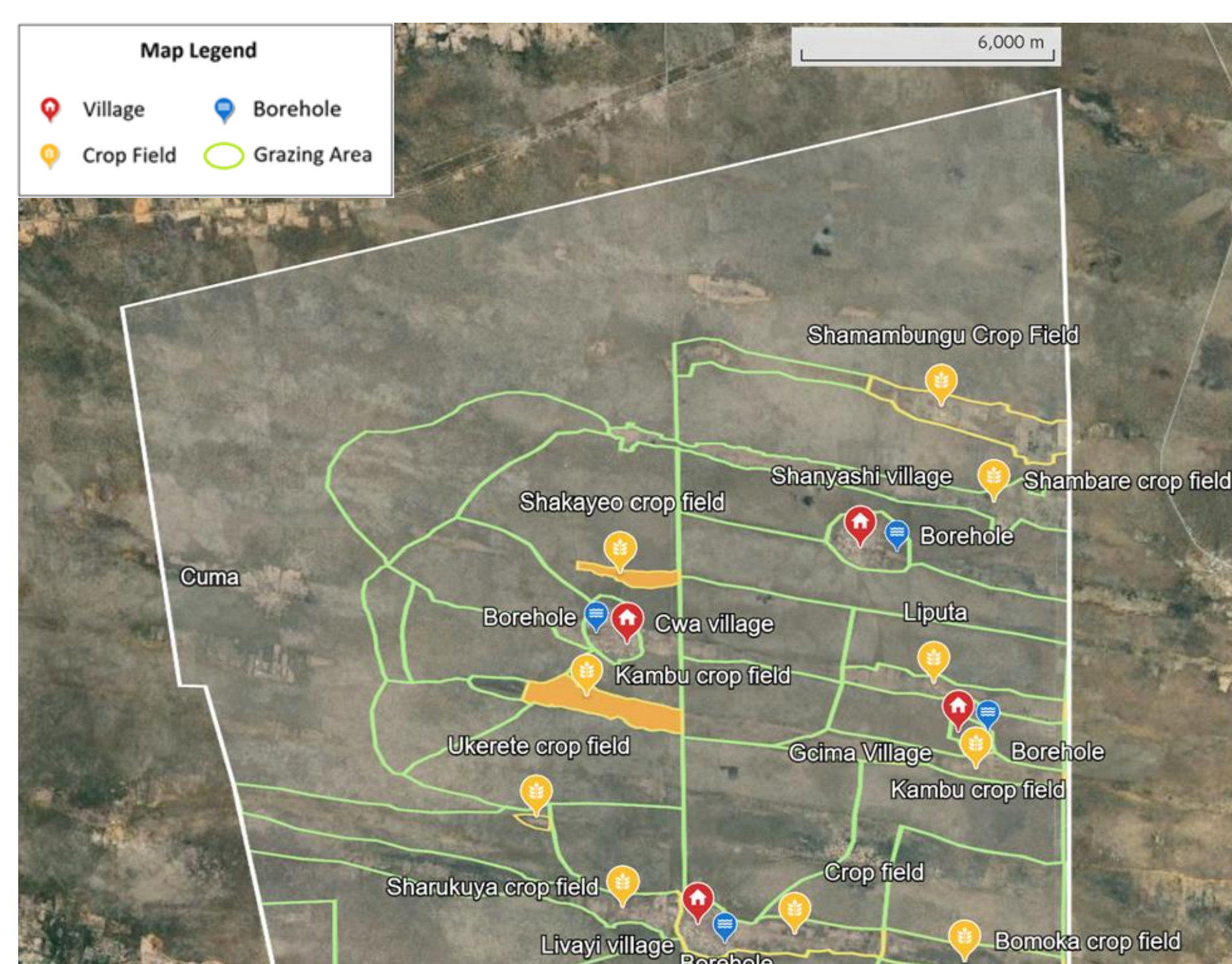


Figure 1: Northern side of the conservancy with borders of grazing and crop units. Note: Highlighted orange zones represent the crop fields grazed during the start of the dry season by participant C/11/HLO/2.

Rainy Season: November - April

Entire seasons: Herding, rotational grazing, joint herding, herd splitting

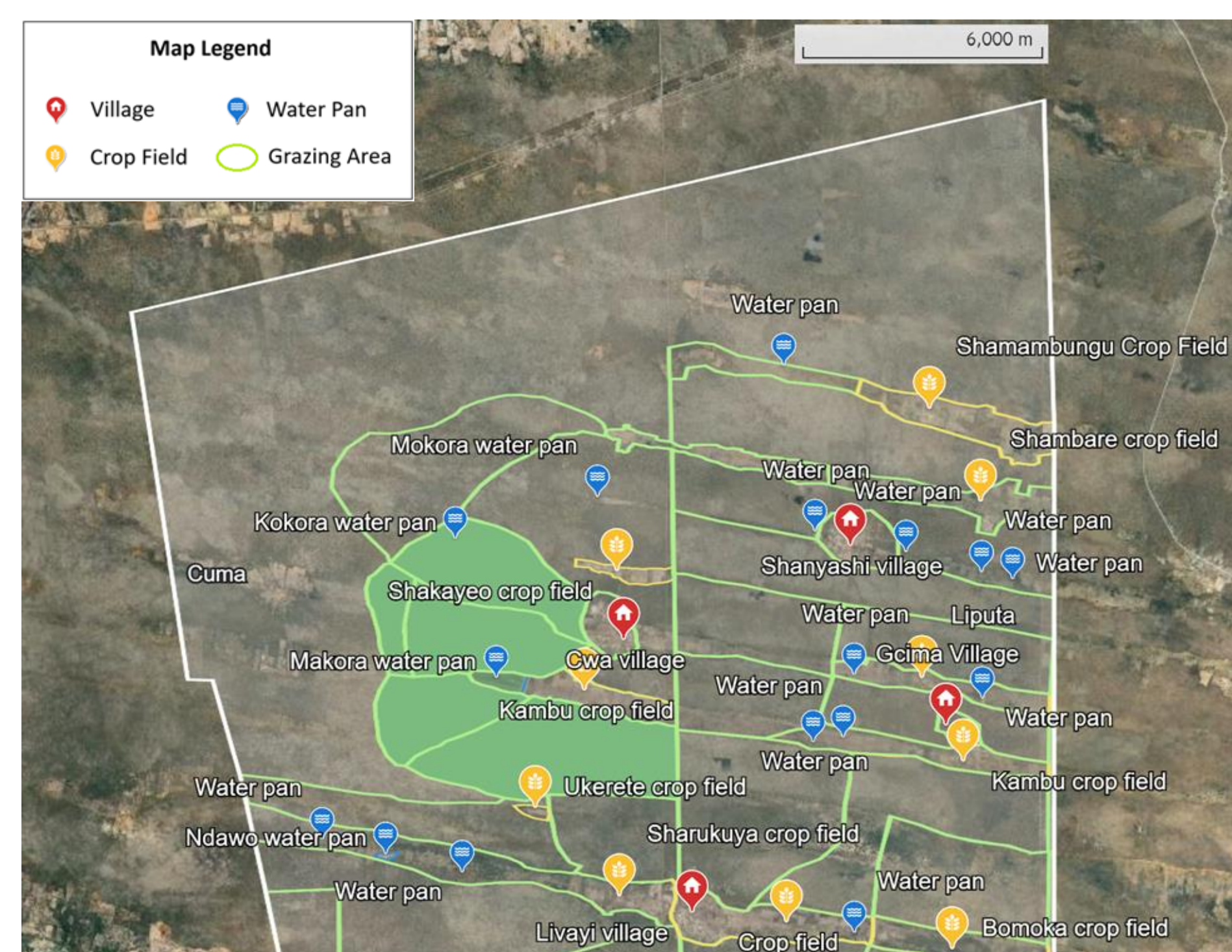
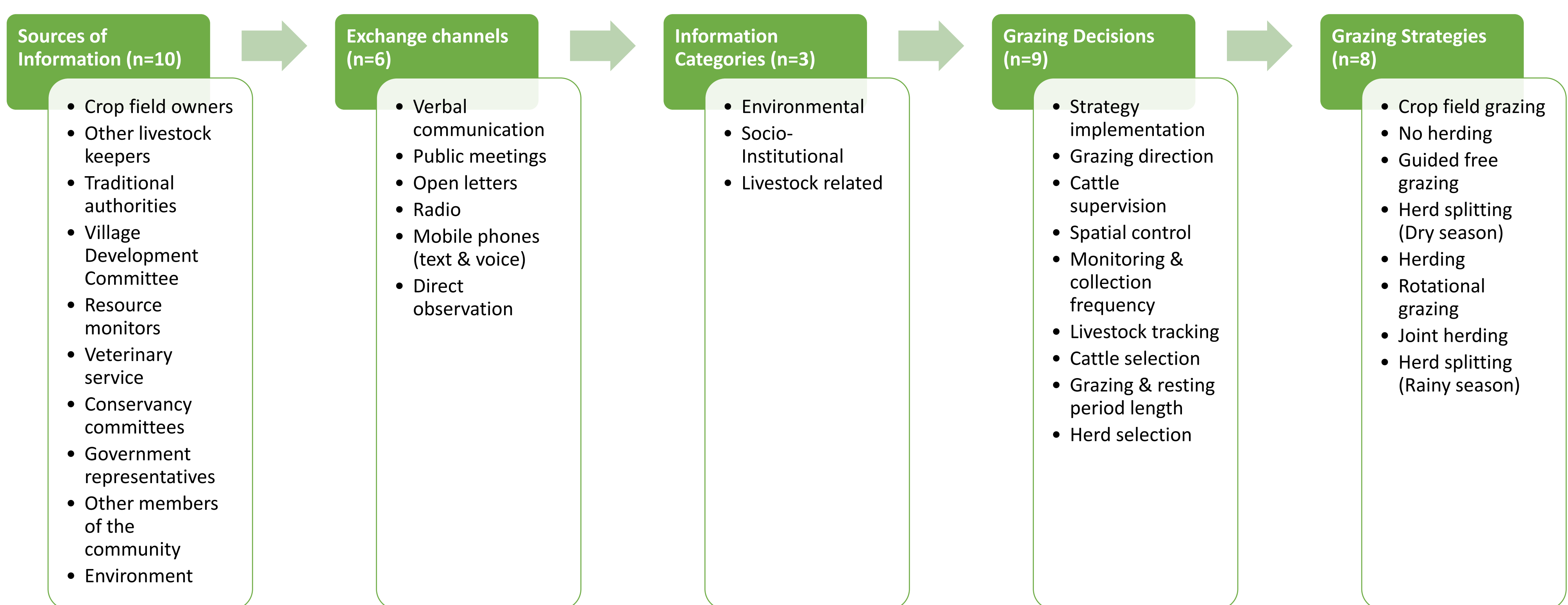
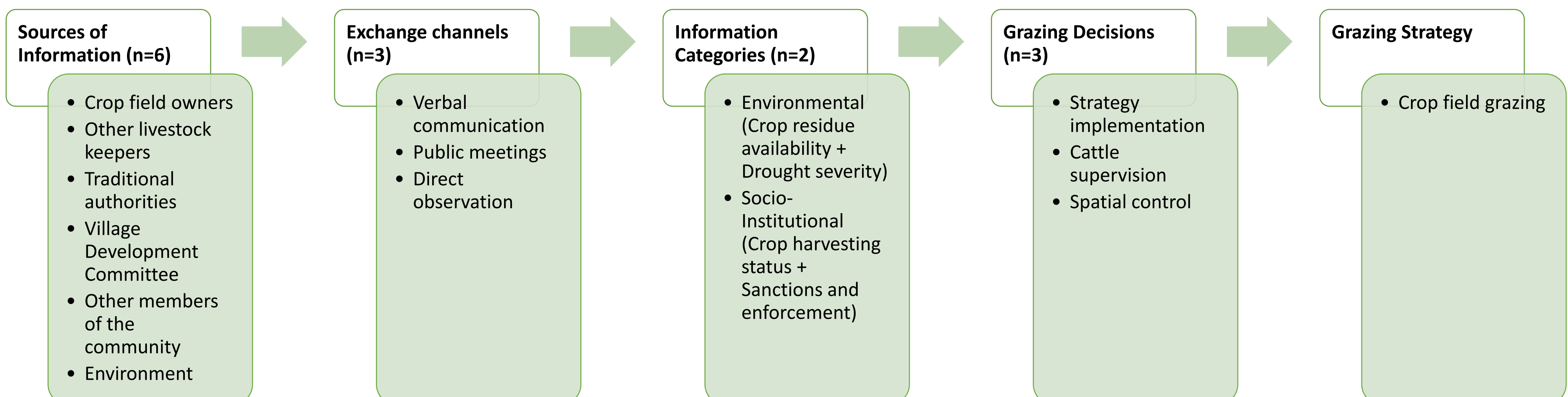


Figure 2: Northern side of the conservancy with borders of grazing and crop units. Note: Highlighted green zones represent the grazing areas used during the rainy season by participant C/11/HLO/2.

Information and Grazing Decision-Making



Example: Crop field grazing



Communication and Digital Technologies

8 types of information were identified that are exchanged through radio and mobile phones (feature phones prevail, while smartphones remain rare).

Digital technology use is limited due to infrastructure, digital literacy, affordability, phone characteristics and personal preferences.

Participants proposed new features for improved decision-making: Photo geolocation, plant image recognition and livestock disease image recognition.

Table 1: Information types exchanged per technology

Technology	Information Types
Radio	Livestock health
	Conservancy rules and recommendations
	Livestock characteristics for identification
Mobile phones (text & voice)	Theft of livestock
	Conflict with wildlife
	Herd/individual animal location
	Wildfires
	Crop field plowing status

Study Area

Location: Muduva Nyangana Conservancy, Kavango East Region, Namibia

Population: 8 villages, approx. 1,700 people

Poverty: ~70% multidimensional poverty incidence

Environment: Woodland savannah; highly seasonal rainfall (0–170 mm between dry and rainy seasons)



Figure 3: Conservancies in Namibia shown in brown and Muduva Nyangana Conservancy highlighted in red. Source: NACSO, 2024

Methodology

Qualitative case study design

Fieldwork: June to August 2025, 65 participants across 5 villages

Participatory methods: Participant observation, seasonal resource mapping (n=25), semi-structured interviews (n=43), focus group discussion (n=1 with 9 participants)

Spatial representation: Resource maps digitized and aggregated in Google Earth

Analysis: Qualitative content analysis of 97h audio transcripts, coded in MAXQDA



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