How herders use vegetation thresholds to guide herding decisions among rendille pastoralists in northern Kenya

Haron Akala[1], Raphael Lotira Arasio[2], Maria Restrepo[3], Brigitte Kaufmann[4], Oliver Wasonga[5]

[1] *University of Nairobi, Land Resource Management and Agricultural Technology , Kenya*

[2] *German Institute for Tropical and Subtropical Agriculture (DITSL), Germany*

[3] *German Institute for Tropical and Subtropical Agriculture (DITSL), Germany*

[4] *German Institute for Tropical and Subtropical Agriculture (DITSL), Germany*

[5] *University of Nairobi, Land Resource Management and Agricultural Technology, Kenya*

Abstract

Vegetation thresholds are critical for sustainable rangeland management, marking the point at which observable changes in vegetation, such as species composition, ground cover, or plant condition, signal declining pasture suitability. While ecological science has long explored thresholds in terms of degradation risk or state transitions, less is known about how pastoralists identify and respond to such changes through local knowledge. This study explores how Rendille herders in Northern Kenya define and use vegetation thresholds to guide herding decisions across seasonal cycles.

The research was conducted in Laisamis Sub-County, Marsabit County, using Photovoice sessions (n=18) and narrative interviews (n=5) with knowledgeable herders during both dry and wet seasons. All sessions were audio-recorded, transcribed, and analysed thematically.

When assessing pasture conditions, Rendille herders use thresholds for several different indicators: Species composition, particularly the presence or absence of key forage species (e.g. *Cynodon nlemfuensis*, Eragrostis ciliaris, Bothriochloa insculpta); Grass height and density, indicating forage quantity and quality and phenological stages, e.g., leaf colour changes (green to grey/black), are used to assess pasture quality. These locally defined thresholds determine whether herders shift grazing sites, adjust herd diets (e.g., increasing use of tree fodder), or conserve specific areas. Such knowledge enables proactive decision-making that helps prevent overuse and maintain ecosystem resilience.

This study highlights that pastoralists' observations and interpretations of vegetation thresholds are detailed, adaptive, and highly contextual. Recognizing and integrating this knowledge can enhance early warning systems, support adaptive grazing strategies, and inform community-led ecosystem monitoring that strengthens both rangeland governance and pastoralist resilience.

Keywords: Herding decisions, local/pastoralist knowledge, photovoice, rangeland management, vegetation thresholds

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Contact Address: Haron Akala, University of Nairobi, Land Resource Management and Agricultural Technology , Upper kabete offices to larmat, 00625 Nairobi, Kenya, e-mail: akalaharon3@gmail.com