

The role of pastoral mobility in valuing variability

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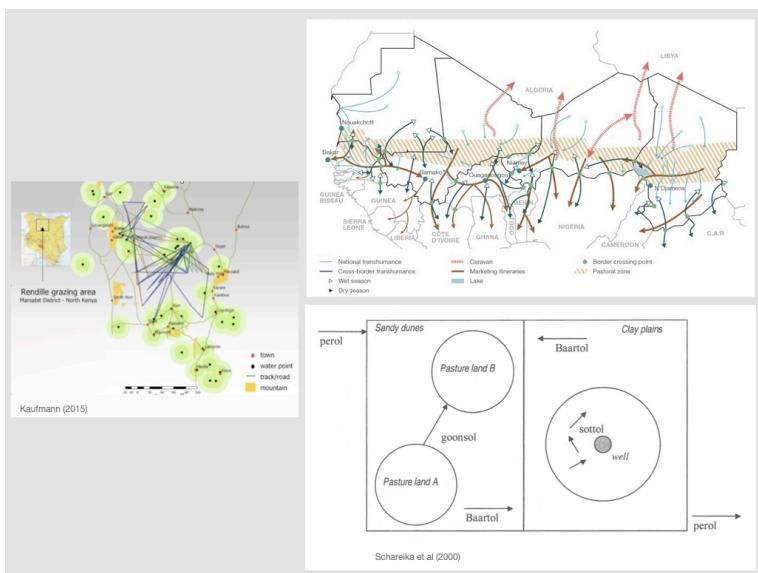
Joint International Grassland and International Rangeland
Virtual Congress 25-29 October 2021



Mobility is a key evolutionary path in natural history: Plants evolved by centralising activity in one location and decentralising functions over their entire organism — they can withstand removal of much of their body without losing functionality. Animals on the other hand evolved by centralising functions in organs and limbs and decentralising activity by moving in the environment.



Mobility is key to wild herbivores' ecological integration in rangelands biomes. Pastoralism has evolved by mimicking and enhancing particular natural processes of such biomes at a range of scales. Today pastoral mobility has a number of different social, economic and political reasons. For example, avoiding insecurity, or passing nearby a settlement for charging the mobile phone and getting the latest information on livestock prices. Here I focus on its functions for animal nutrition in unpredictable climates.



The generality of mobility as an analytical category is a product of translation. Pastoralists use different words for different functions of what we call 'mobility'. Examples of such precisely identified functions from Sub-Saharan Africa include moving to find green grass at the beginning of a rainy season; moving seasonally between ecological zones; the orbital movements around a watering point during the dry season; moving between camp and pasture or between camp and water point; or moving along a deliberate grazing itinerary in the course of a day.

Variable concentrations of nutrients



Pastoral mobility, in all its functions, is strategic: based on carefully gathered information. Mobility is aimed at *matching* the unpredictable climatic conditions pastoral systems have evolved to use to their advantage.

Concentrations of nutrients for livestock on the rangelands are important, but often unpredictably variable at all scales in both time and space. The most obvious differences are between seasons and ecological zones. For example, dryer rangelands in the rainy season... or higher altitude rangelands in the Summer, offer the best concentrations. But also differences at lower scales are significant. Pasture is more nutritious at night, after a day of photosynthesis. And nutrients concentrate in plants at a certain stage of their life-cycle, before being used for reproduction.



Therefore, mobility is about *time* as much as space. It is, quite literally, about being in the right place at the right time in contexts where opportunities can be important but uncertainty rules. The window when nutrients peak can be a matter of days. The primary function of pastoral mobility is about harvesting this peak nutritional content. Arriving too early or too late means less nutrients *from the same rangeland*.

Harvesting peak nutrients over months is only possible thanks to rainfall variability and biodiversity (including in soil). Patchy and itinerant rains start plant cycles in temporal and spatial sequences. By tracking such sequences through the rangelands, pastoralists can keep their herds on nutrient-peaking pasture for longer than the nutrient-peaking window in each area they visit. The methods for assessing the feed balance of rangelands are still catching up with this complexity, and especially the importance of time-related change.



The specialisation of pastoral systems, to make use of unpredictable conditions, has become more valuable in the face of climate change. Pastoralists' vulnerability to climate change comes mostly from non-climate stressors, and boils down to being prevented from making use of their specialisation, especially by obstacles to mobility. On the other hand, pastoralists' resilience to climate change does not depend on the familiar solutions to externalise nature from agriculture.

Mobile pastoralism is attracting new interest as a global phenomenon because it shows a pathway to climate resilience without depending on the high-energy inputs and intensive use of resources that have triggered global warming and are keeping humanity on a trajectory to runaway climate change.

Supporting pastoral systems, and improving their understanding, are crucial steps on the pathway to developing sustainable resilience of food production in the face of climate change and related uncertainty.