Intensification of pastoralism as a driver of degradation in the Algerian steppe
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Context
Land degradation linked to pastoralism use has been a worldwide concern for decades. A biological approach has often been used to understand such phenomena, usually disregarding economic and social factors. Calls for widespread use of supplementary fodder arise both from the pastoralist civil society and from international organizations as a means to mitigate droughts and increase food security in the short term. Past massive interventions based on the widespread use of supplementary fodder have been identified as a trigger for a change of state in North African rangelands, which could be the root cause that undermines their productiveness in the long term.

Objective
Transformations of pastoralism at the Algerian steppe constitute a good case study to provide an integrated understanding of such interventions and to better orient development in other pastoralist areas across the world.

Study area and methods
The study was conducted in the the Algerian steppe:
- semi-arid climate area (100-450 mm/year) of 20 million hectares;
- rainfall is irregular and temperatures reach 40 ° C in July, and drop below 0 ° C in January.
- sheep and goat livestock (26 million heads);
- Afqa (Sistop tenacissima), Mugwort (Artemisia herba alba) and Sparth (Lygeum spartum) rangelands.

Data collection:
- A non-probability, predefined and reasoned sampling.
- 236 interviews with agro-pastoralists.
- 20 interviews with stakeholders involved in agro-pastoral activity: agricultural services, chamber of agriculture, veterinarians, forestry services, academics, and notables.
- Phytoecological surveys in situations of free access and controlled grazing, to assess the forage potentialities.

Results
The practice of transhumance by nomadic pastoralists has declined. Other more sedentary types of pastoralism combined with intensive crops have emerged.
Family-related or paid herders live on tents during herd mobility and live in a fix household the rest of the year. Grass is just ¼ of total livestock intake and barley accounts for the rest – increasing livestock numbers above the carrying capacity. All the farms surveyed cultivate fodder cereals which are generally harvested, and a few (21) cultivate irrigated, grazed or wilted alfalfa. Permanent vegetation cover (perennial) is always relatively more conserved in controlled grazing areas. Uncontrolled rangelands suffer from degradation by overgrazing, more particularly during periods of drought.

Variation of the phytomass of perennial species in relation to precipitation in controlled and free-grazing areas of Rogassa. (Source: Bencherif & Slimani, 2021)

(A and B) different conditions of the rangelands and (C and D) some practices in the steppe region.

Vulnerability to climate variability and cereal price fluctuations in the international market is consequently higher.

Conclusion
Intensive agro-pastoral production systems are emerging as a degradation factor in the steppe today. The Algerian steppe has been experiencing desertification over large areas for several decades, and the livestock feed provision can be a major source of this degradation. Specific mechanisms should be envisioned to prevent severe environmental impacts associated with pastoralism intensification. Fodder inputs are useful only if information and sufficient skills are available to make the best of them – otherwise they may threaten the sustainability of pastoralism in the long term.

References