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Risk management dynamics and adaptive capacities of Andean and Alpine pastoral systems: insights from temporal and spatial comparisons

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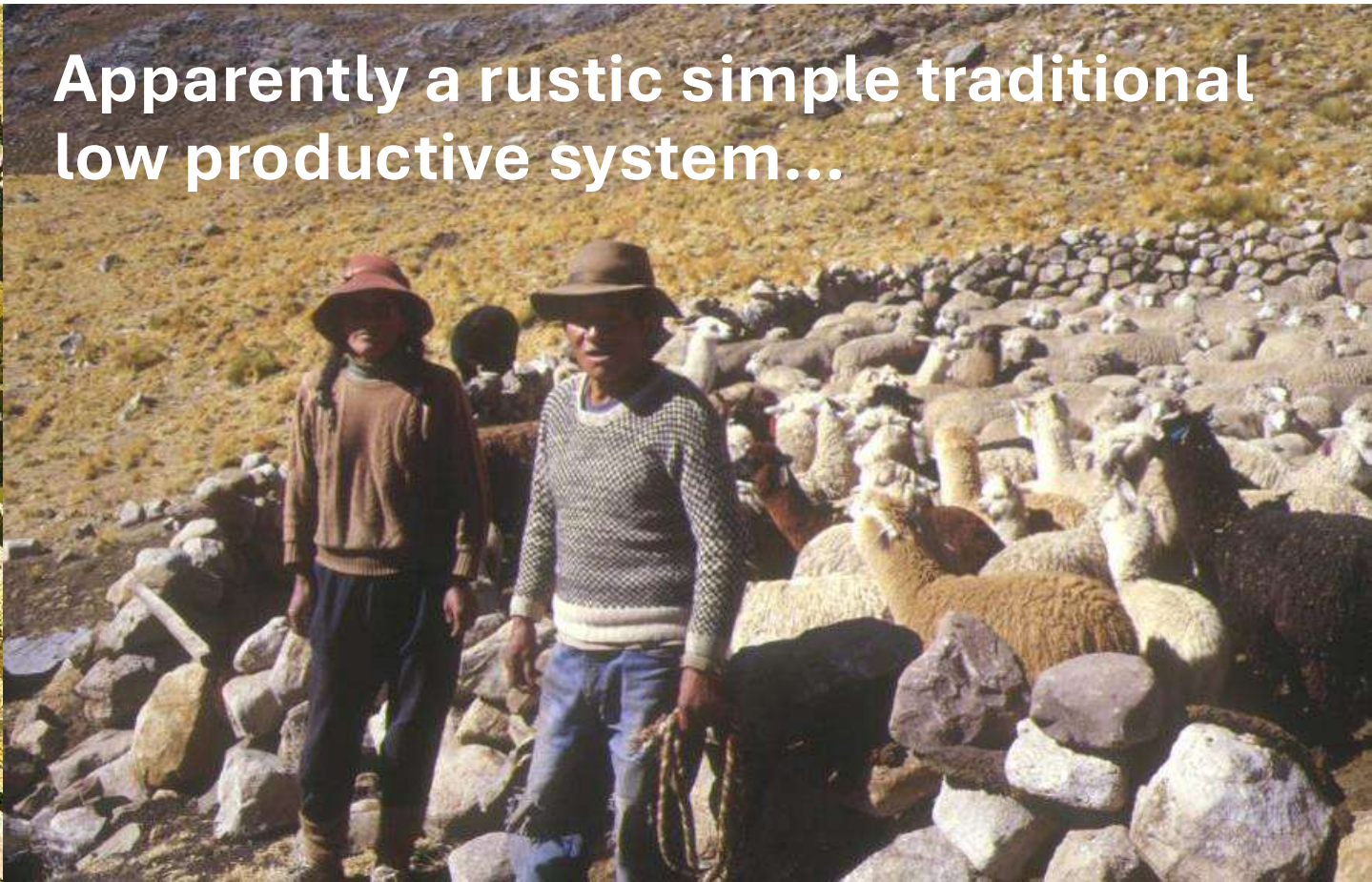
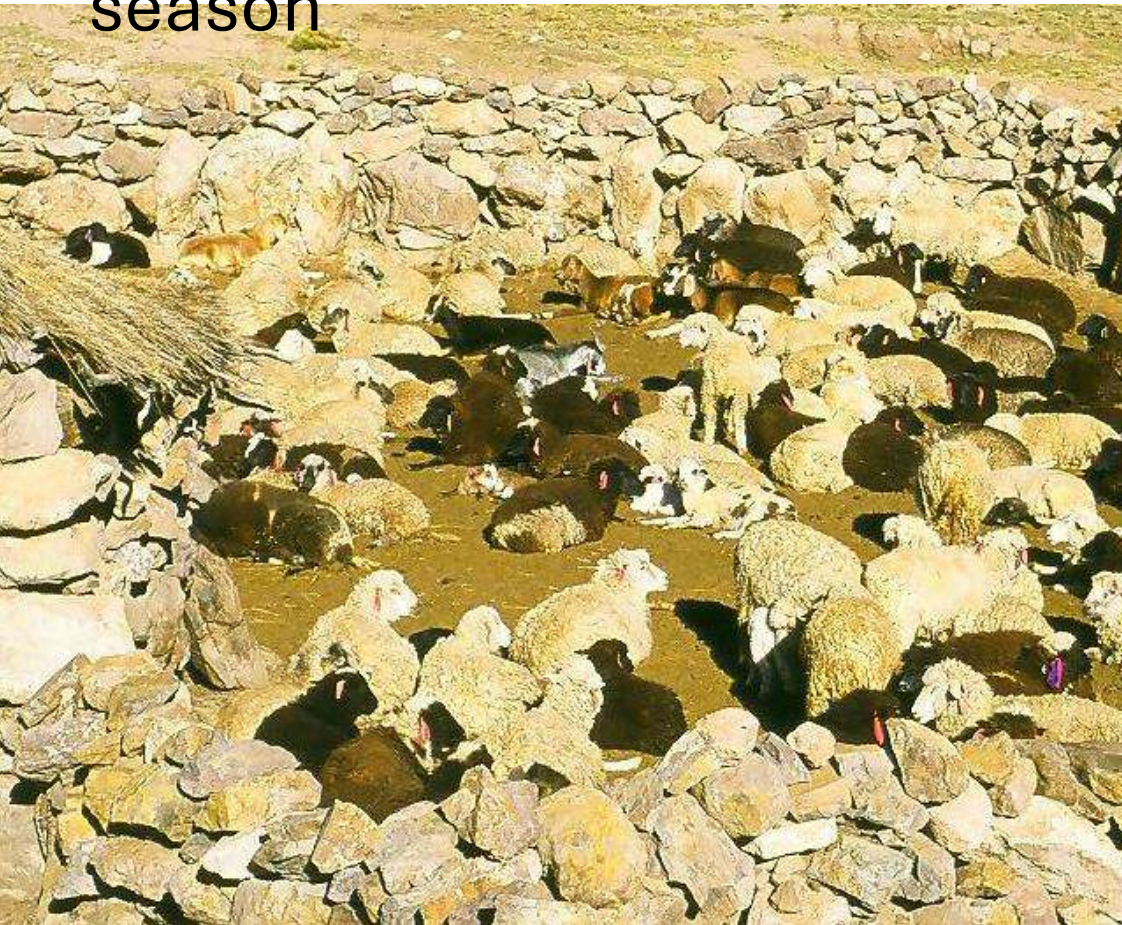
A 1st approach of andean pastoral systems in 1985

I have to study traditional livestock systems in central Andes, and to understand and analyse their practices, with a systemic approach



A 1st approach of andean pastoral systems in 1985

Family farms: 200–400 sheep and alpacas, 2–10 cattle, 200–300 ha of puna, at 3,500–4,500 m of altitude, inside a peasant community, dry and rainy season



Apparently a rustic simple traditional low productive system...

Coming from 5000 years of evolution, this pastoral system appears very well adapted to the context, with specific and clever practices

Practices: multi-species herds, local breeds, and 3 seasons of calving spread throughout the year...



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Feed exclusively by grazing pasture composed of native plant of the Andean puna...

**Savings in animals
or products, using
local sales in short
supply chains**



**Shaving half flock every year,
and just some animals each
morning in rainy season
(during ~ 4 month)**



A 1st approach of andean pastoral systems in 1985

- As results in the XXth century, this study highlights that:
- Farmers favoured guaranteed regular production over quantitative maximisation
- Using practices designed to limit the risks
 - As shaving or calving spread over several seasons...
 - As economical management : without bank access and with high inflation
- They have to be able to maintain by themselves or by local community helps and support.
And they've been doing it for centuries!

Updating this approach of andean pastoral systems

- Using in 2025 the concepts of sustainability, resilience, robustness, and risk analysis, we could analyse that:
- This Andean pastoral system could be described as resilient, prioritizing sustainability over efficiency and productivity.
- In a context without any support structures (banks, insurance, technical advice), this systems choose a stable strategy based mainly on the inherent capabilities of livestock systems, local market and possibilities, and by limiting their vulnerability to adverse events. They do with what they have in their context!
- This resilient strategy may highlight the risk management strategy of other pastoral sheep systems

2025: how alpine sheep systems manage multi risks ?

Forty years later, an analysis of multiple risk management practices in pastoral sheep systems in the central Alps highlights multiple strategies for taking risks into account: particularly those related to the interface between wildlife and livestock farming systems



2025: how alpine sheep systems manage multi risks ?

Practices reflect a **logic of vulnerability reduction** based on "doing with nature"
Favouring the absorption of hazards rather than their control



2025: how alpine sheep systems manage multi risks ?

Strengthening the autonomy of systems in the face of the uncertainty of the various risks (such as predation, disease, climate change, societal expectations, economic losses)... and using short supply chains, adopting specific practices to face uncertainties...



Comparing the relation to risks of andean and alpine systems

The similarities in practices and objectives between these livestock farming systems, distant in time and space, highlight:

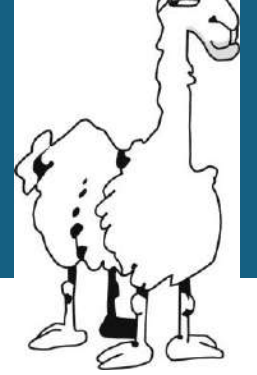
- the relationship to risks
- the use of internal solutions within farming systems rather than external aid or support,
- the intrinsic resilience of pastoral systems to endure in mountain areas

This diachronic and geographical comparison

- illustrates the importance of comparative methods for analysing complex livestock systems.
- highlights the central role of risk management in pastoral systems that are structurally confronted to a degree of uncertainty with which they must cope.
- Their ability of these pastoral systems to take their vulnerabilities into account and work to mitigate hazards is an essential component that allows them to maintain margins for manoeuvre in the short and long term.
- Understanding this ability is a prerequisite for analysing the resilience of pastoral systems in a context of global change



Thank you for your attention !



Take-home references...

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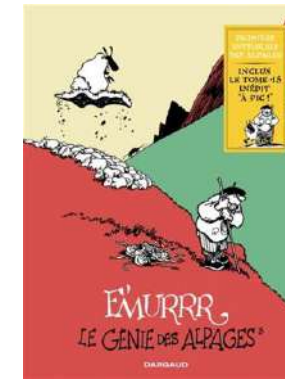
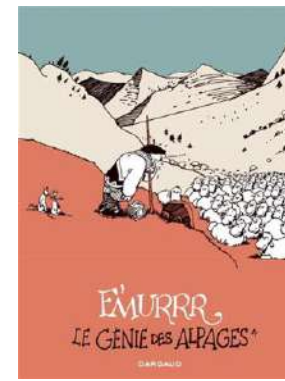
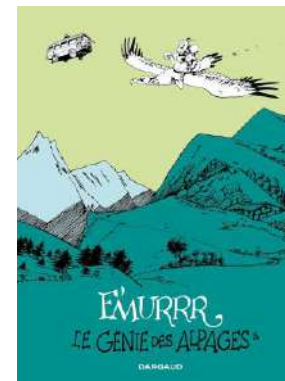
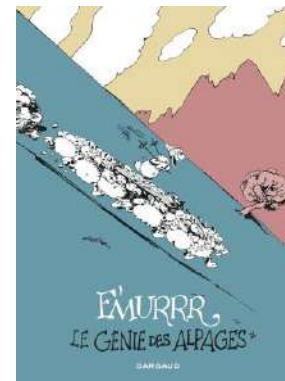
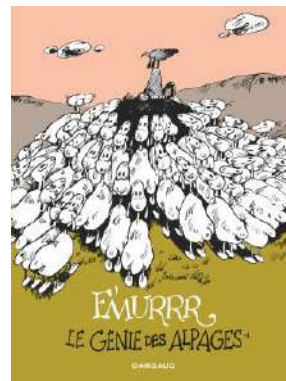
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Virapin, M., Sturaro, E., & Brunschwig, G., 2026, Multiple risk analysis at the interface between pastoral livestock systems and wildlife. *Pastoralism*, Volume 15 – 2026. <https://doi.org/10.3389/past.2025.15413>

Franc, M., Virapin, M., Sturaro, E., & Brunschwig, G. (2026). When Sheep Flocks Meet Wildlife: A Typology of Suckler Sheep Pastoral Systems in the Vanoise and Ecrins Mountain Ranges. Communication submitted to the seminar *Pastoralism: Crossed Perspectives for the Future*, Institut Agro Montpellier, France.

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PHOTOS ADDITIONNELLES SI
BESOIN

Références qu'on peut mobiliser
et mettre en fin de diaporama :
Virapin et al, 2026 (revue de
littérature)

Franc et al, 2026 (com magali
typology séminaire montpellier)

