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The Global Land Outlook Thematic Report on Rangelands and Pastoralists: framework and theory of change for sustainably managing and restoring rangelands

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Abstract

The United Nations Convention to Combat Desertification (UNCCD) released its Global Land Outlook Thematic Report on Rangelands and Pastoralists (GLO) on 21 May 2024. The report offers a singular perspective on the sustainable management of rangelands and the critical role of pastoralists and extensive livestock systems, focusing specifically on their capacity for advancing towards Land Degradation Neutrality.

This paper offers a methodological approach to the narrative of the GLO. It starts by analysing the Driver-Pressure-State-Impact-Response (DPSIR) model of rangeland health and degradation status. It then explains the role of this model in the design of a Theory of Change for the report and the transition towards a conceptual framework for managing rangelands as social-ecological systems. Finally, the presentation links this methodology with the case studies and the actions and recommendations of the report.

Effective governance of rangelands requires a better understanding of their capacities, dynamics and the future supply and demand for their goods and services. The challenge is to ensure that these vast landscapes are managed in a sustainable manner while addressing the synergies and trade-offs under trans-disciplinary and multi-actor frameworks. This approach demands a strong scientific background but also a holistic and flexible conceptual framework that can lead to clear objectives and practical means of implementation, including policy frameworks, direct action, improved governance and better investments.

Introduction

The United Nations Convention to Combat Desertification (UNCCD) released its Global Land Outlook Thematic Report on Rangelands and Pastoralists on 21 May 2024. The report explores the links between rangelands and local communities. The report offers new entry points, possibilities, and recommendations for policymakers and other stakeholders that encourage greater attention, financial support, and investment

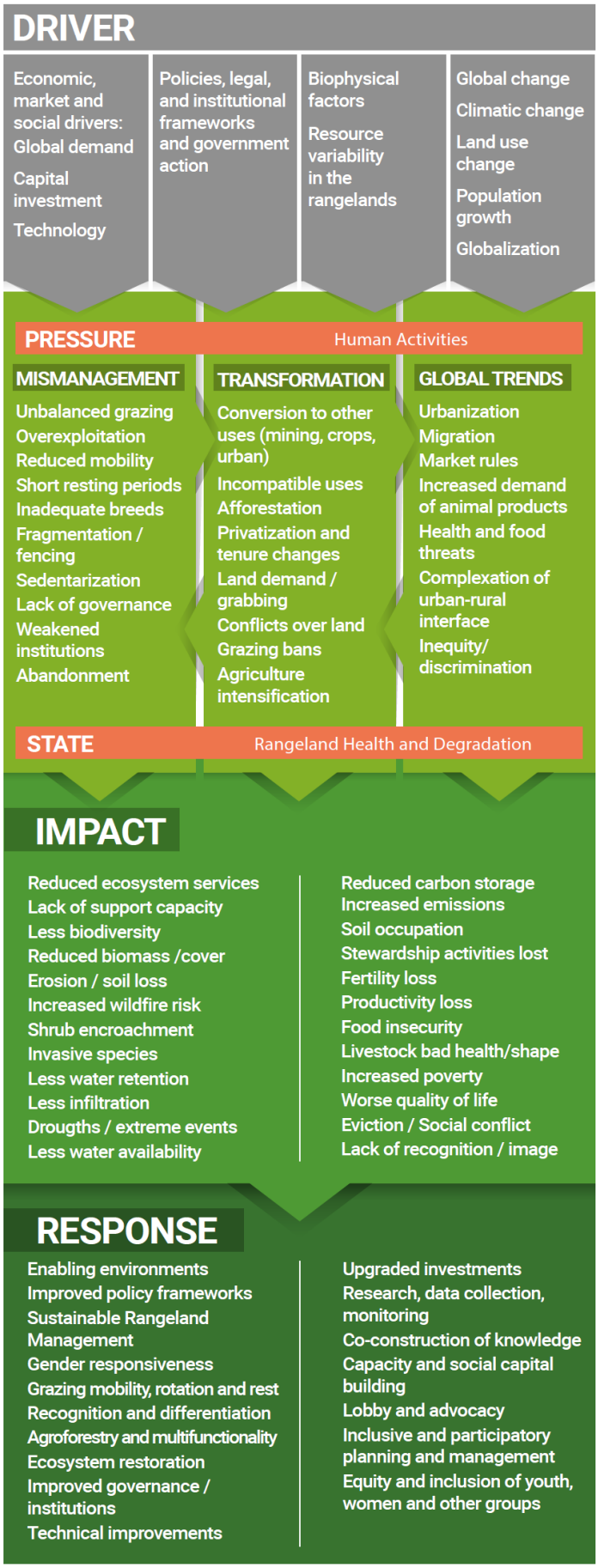

Figure 1. Rangelands' health and degradation status diagram designed for the GLO Rangelands report based on the DPSIR model

in Sustainable Rangeland Management (SRLM). It concludes that local, multi-actor, transdisciplinary, adaptive, and inclusive approaches are needed to improve the health and sustainable productivity of rangelands and the livelihoods of their stewards. The GLO Rangelands report also unravels the role and untapped potential of pastoralism and other extensive livestock management systems in reducing land degradation, contributing to just and equitable rural development and food security, protecting the rangeland commons, and generating transformational change towards climate resilient societies, while improving the health of these critical landscapes and the livelihoods of their communities.

This paper presents the methodology applied in the analysis and the narrative of the GLO seeking to encourage substantial change in the conceptual framework currently applied to combat desertification and degradation in rangelands, through sustainable management practices under pastoralist and other extensive livestock systems.

Methods

The methodology applied to sustain the rationale of the GLO Rangelands report starts with the definition of rangelands and then it is developed through three stages: health / degradation model, conceptual framework and Theory of Change. The actual methodology of building the framework for the report wasn't sequential but iterative, complementing each stage with the outcomes of the other two.

Results

The report substantiates a definition of rangelands based on grazing activity of open ecosystems by livestock and/or wild animals. Thus, they are considered as complex social-ecological systems (Hruska et al, 2017) whereby natural resources

provide a broad range of goods, services, and values that must be considered in functional assessments (FAO, 2019). The base natural and semi-natural ecosystems hosting those rangelands are populated by indigenous vegetation predominantly comprised by grass, grass-like plants, bushes, or shrubs, including open forests and agroforestry systems.

The first stage consists in composing a rangeland health / degradation diagram (Fig 1) based on the Driver – Pressure – State – Impact - Response (DPSIR) model (Burkhard & Müller, 2008), which addresses complex challenges at the interface between society and the environment (Troian et al., 2021). The DPSIR model analyses rangeland health and degradation status, drivers and trends, addressing the complex trade-offs and interactions at the interface between rangelands, society and the environment.

The second stage allocates the agents and fluxes described in this model in a broader framework supporting the conceptualization of rangelands as social-ecological systems. This way, the DPSIR health / degradation model precedes the actual conceptual framework represented in Figure 2, where the elements and relationships shaping rangelands are organised through a multifunctional approach that links rangeland health and their management systems. The framework shows how they are intimately linked within the same social-ecological system. Thus, a systemic approach is needed to understand and sustainably manage rangelands, especially under pastoralist systems.

This way, the complex network of relationships among these elements in diverse political and social environments shapes the use and management of rangelands. Addressing land governance challenges opens the scope to the whole territory and to all stakeholders involved, a prerequisite for meeting national and global objectives addressed in the report (Davies et al., 2016). Accordingly, the conceptual framework allows the definition of a Theory of Change that shapes the whole report and organises their targets, means and outcomes. The complex network of relationships among these elements in diverse political and social environments shapes the use and management of rangelands.

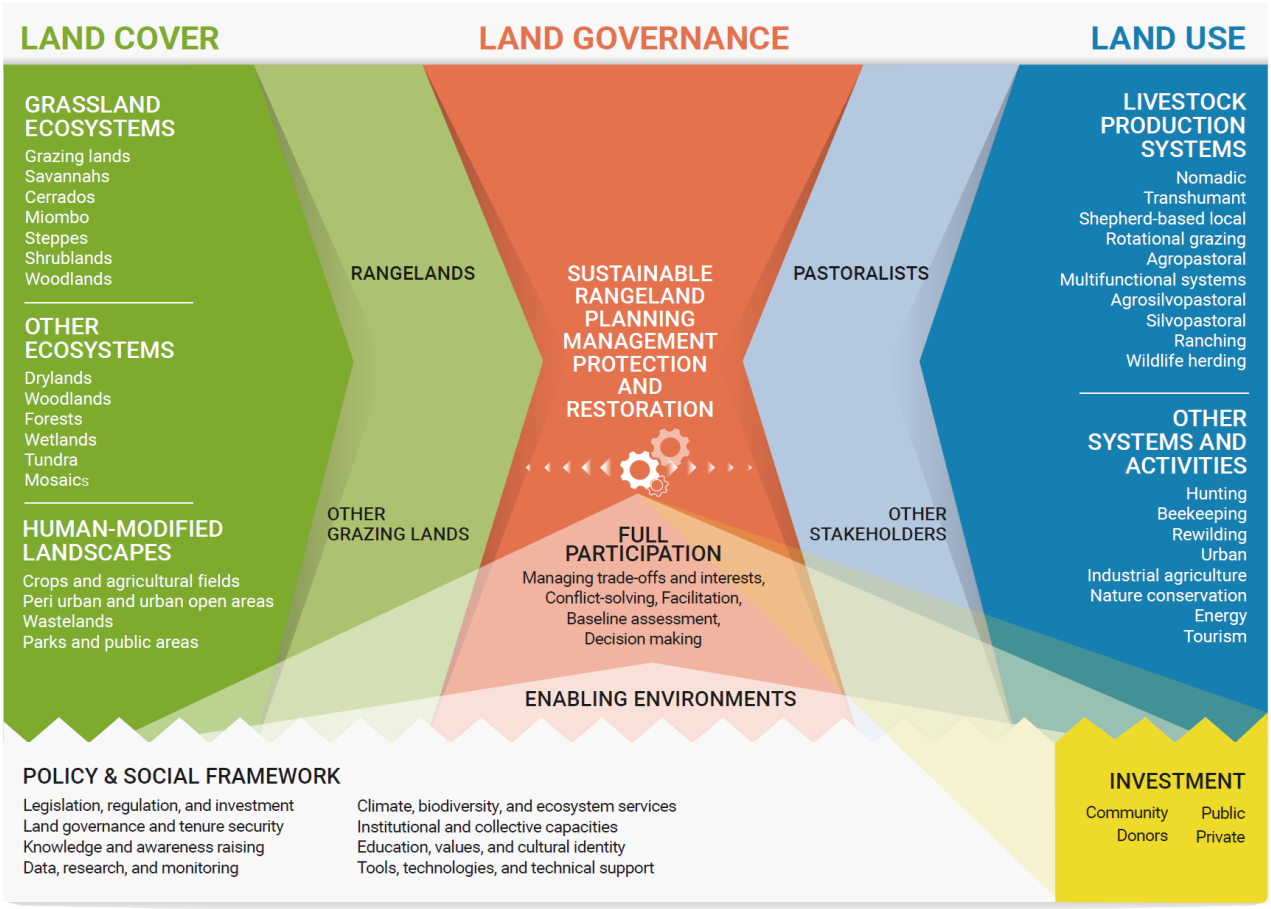

Figure 2. Conceptual framework for addressing rangelands sustainable management and governance as displayed in the GLO-Rangelands report.

Using the rangelands health/degradation model and the conceptual framework, the report was able to build a Theory of Change, displayed in Figure 3. This Theory of Change enables the development of the aims of the report, exploring the complex environmental, social, and economic dimensions that link rangelands and local communities and addressing the important role and untapped potential of pastoralism and extensive livestock management systems to contribute to a just transition, climate resilience, and more equitable rural development.

Discussion and Conclusions

There are notable disparities in the assessments of rangeland degradation which estimate its extent and degree globally. The mix of biophysical, social, and economic factors influencing land, its production, performance and health are often viewed subjectively (FAO, 2013). The estimates of rangeland degradation have changed over time, reflecting the progress made in the understanding of rangeland dynamics and indicators, assessment and monitoring tools, and management and land use systems (Onyango et al, 2021). Besides, there are still critical gaps in the knowledge, data, and interpretation of rangeland dynamics. Rangelands demand more research, data collecting and monitoring effort related to economic analysis, carbon pools, water cycle regulation, shrub encroachment and specifically their spatial and temporal use.

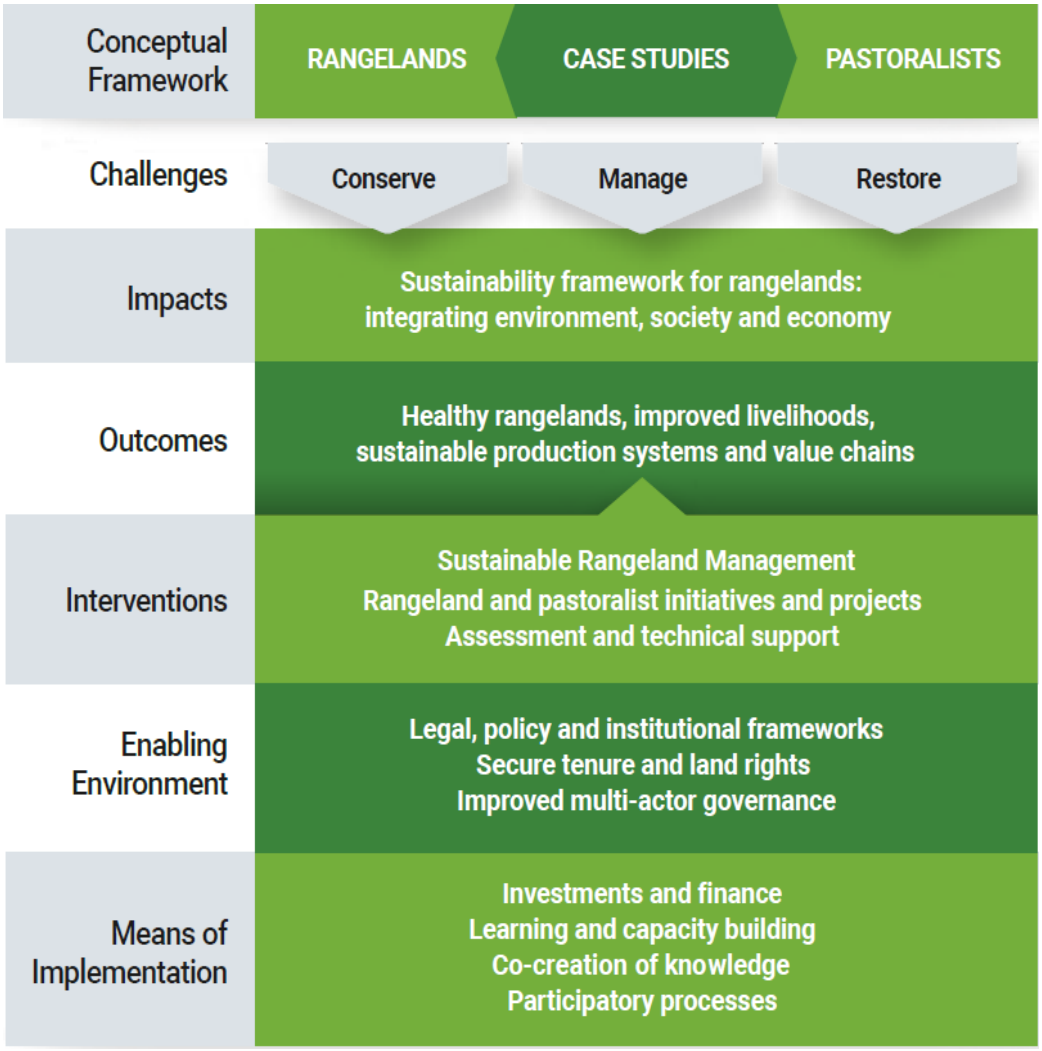

Figure 3. Theory of change developed within the GLO-Rangelands report.

The effective governance of rangelands requires a better understanding of their dynamics, capacity, and the future supply and demand for their goods and services. There has been a recent shift from the unsustainable demand for the tangible or market goods produced on the rangelands, to policies and regulations that recognise and value the wider range of services they provide to people, nature, and the climate (Yahdjian et al, 2015) The challenge is to ensure that supply and demand meet in a sustainable manner while addressing the synergies and trade-offs under transdisciplinary and multi-actor frameworks.

The complex network of relationships among these elements in diverse political and social environments shapes the use and management of rangelands. Addressing land governance challenges opens the scope to the whole territory and to all stakeholders involved, a prerequisite for meeting national and global objectives addressed in the report. However, it is important to recognise that many of the challenges confronting rangelands originate beyond local communities and are not under their control, although they should be a fundamental component of its governance.

The conceptual framework (Figure 2), complemented with the DPSIR framework (Figure 1), and the Theory of Change (Figure 3) arising from them provides the rationale for the GLO Rangelands report. This framework also underpins the global effort to protect rangelands and contributes to the effectiveness of initiatives at national and local scales. As many rangelands share common features, multi-scale perspectives and context-specific interventions can often help refine a global approach to plans, strategies, case studies and good practices. Additionally, the framework can also help to inform specific response measures, management systems, legal advances and governance schemes that can be used by different initiatives.

This framework has provided guidance for the analysis of case studies and projects collected in the report, using a common lens to address their specific features and focal points, ultimately shaping the recommendations collected in the report and its policy brief.

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References

Burkhard, B. and Müller, F., 2008. "Driver–Pressure–State–Impact–Response", In Encyclopedia of Ecology. Ecological Indicators, 2, pp. 967–970. https://doi.org/10.1016/B978-008045405-4.00129-4

Davies, J., Herrera, P. M., Ruiz-Mirazo, J., Mohamed-Katerere, J., Hannam, I., & Nuesiri, E. (2016). Improving governance of pastoral lands. FAO. https://www.fao.org/3/a-i5771e.pdf. Accessed 11/02/2025

FAO, 2013. Land Degradation Assessment in Drylands: LADA Project – Methodology and Results, FAO, GEF, Mecanismo Global de la UNCCD, UNCCD, UNEP. http://www.fao.org/3/i3241e/i3241e.pdf. Accessed 11/02/2025

FAO, 2019. Trees, forests and land use in drylands: the first global assessment – Full report. FAO Forestry Paper No. 184. Rome: FAO. https://www.fao.org/documents/card/es/c/ca7148en/. Accessed 11/02/2025

Herrera Calvo, P. M., & Alexander, S. (2024). A new perspective on rangelands and pastoralists to reverse their silent demise, which is impacting climate and food supply for billions. *Global Change Biology*, 30(6), 0–2. https://doi.org/10.1111/gcb.17377

Hruska, T., Huntsinger, L., Brunson, M., et al., 2017. "Rangeland as Social-Ecological Systems". In D.D. Briske, ed. Rangeland Systems: Processes, Management and Challenges. Cham: Springer International Publishing (Springer Series on Environmental Management). https://doi.org/10.1007/978-3-319-46709-2.

Onyango, V., Davies, J., Sharpe, N., et al., 2021. "Land degradation neutrality: A rationale for using participatory approaches to monitor and assess rangeland health". FAO and IUCN. https://doi.org/10.4060/cb6131en

Troian, A., Gomes, M.C., Tiecher, T., et al., 2021. "The Drivers-Pressures-State-Impact-Response Model to Structure Cause−Effect Relationships between Agriculture and Aquatic Ecosystems", *Sustainability*, 13(16), p. 9365. https://doi.org/10.3390/su13169365

UNCCD (2024) GLO Thematic Report on Rangelands and Pastoralists. https://www.unccd.int/GLORangelands. Accessed 11/02/2025

Yahdjian, L., Sala, O. E., & Havstad, K. M. (2015). Rangeland ecosystem services: Shifting focus from supply to reconciling supply and demand. *Frontiers in Ecology and the Environment*, 13(1), 44–51. https://doi.org/10.1890/140156