

Relational resiliences: reflections from pastoralism across the world

Greta Semplici, L. Jamila Haider, Ryan Unks, Tahira S. Mohamed, Giulia Simula, Palden Tsering (Huadancairang), Natasha Maru, Linda Pappagallo & Masresha Taye

To cite this article: Greta Semplici, L. Jamila Haider, Ryan Unks, Tahira S. Mohamed, Giulia Simula, Palden Tsering (Huadancairang), Natasha Maru, Linda Pappagallo & Masresha Taye (2024) Relational resiliences: reflections from pastoralism across the world, *Ecosystems and People*, 20:1, 2396928, DOI: [10.1080/26395916.2024.2396928](https://doi.org/10.1080/26395916.2024.2396928)

To link to this article: <https://doi.org/10.1080/26395916.2024.2396928>



© 2024 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.



[View supplementary material](#)



Published online: 20 Oct 2024.



[Submit your article to this journal](#)



Article views: 1784



[View related articles](#)



[View Crossmark data](#)



Citing articles: 4 [View citing articles](#)



Relational resiliences: reflections from pastoralism across the world

Greta Semplici ^{a,b}, L. Jamila Haider *^c, Ryan Unks ^{d,b}, Tahira S. Mohamed *^e, Giulia Simula^e, Palden Tsing (Huadancairang) ^{e,f}, Natasha Maru^e, Linda Pappagallo^e and Masresha Taye^e

^aDepartment of Cultura Politica e Società, University of Turin, Turin; ^bRobert Schuman Centre for Advanced Studies, European University Institute, Fiesole, Italy; ^cStockholm Resilience Centre, Stockholm University, Stockholm, Sweden; ^dNational Socio Environmental Synthesis Center, University of Maryland, Annapolis, MD, USA; ^eSTEPS Centre, Institute of Development Studies, United Kingdom; ^fCentre for Pastoralism Studies, Qinghai Minzu University, Xining City, Qinghai Province, China

ABSTRACT

Resilience is a common concept in pastoralism scholarship and policy-making, especially in dryland environments where livelihoods are considered vulnerable to frequent shocks such as droughts, pests and epidemics, and conflicts. Resilience lends itself to pastoral studies due to its ability to capture uncertainty, complexity and dynamism: key characteristics of dryland environments and pastoral systems. However, resilience has also been critiqued for inadequately incorporating aspects of power, its emphasis on individual agency and nature-culture dualism, and its problematic application in development. We build on recent sociology, anthropology, and scholarship on pastoralism to contribute to the 'relational turn' in sustainability science to address: How can an approach focused on processes and relations, and socio-ecological interdependence help us better understand resilience in pastoral landscapes? And vice versa: how can pastoralism offer insights about how to understand resilience starting from processes and relations? We compare different empirically grounded formulations of resilience that researchers operationalize in six pastoral case studies from Africa, Asia and Europe.

ARTICLE HISTORY

Received 11 October 2023
Accepted 7 August 2024

EDITED BY

Seb O'Connor

KEYWORDS

Pastoralism; relational resilience; process relational; Africa; Asia; Europe

1. Introduction: relational resilience, gaps and contributions

Rather than having a seasonal camp site, the Rabari pastoralists of the Kachchh district of western India move every few days, going from field to field, pasture to pasture. Their camp is particularly lean to facilitate this frequent movement. During the monsoon, when grazing in the commons, often a clear patch of pasture is chosen, that is free of thorny bushes and still has access to firewood and water. During the summer and winter months, fields that are fallow or harvested are chosen. Preference is given to those farms whose owners may be willing to offer a gift or compensation in exchange for the manure deposit of the livestock. The leader of the migrating group scouts for newly harvested farms and negotiates with farm owners for such arrangements, while the shepherds organize the daily routes of the sheep to arrive from one camp site to the next after a day's grazing, the flock and camp converging each evening.

It was the winter now, late November, well after the rainy season in the dryland area of Kachchh. Five camps with nine camels walking along the small tar country road. Children playing on the outskirts of their villages turned to look at us as we passed. After an hour or so of

walking, we turned off the road into the fields and walked on ahead into the wilderness. These were fallow lands cleared of vegetation. Suddenly, a hailstorm came down on us. Everyone rushed to protect their belongings from the rain. The camp members quickly pulled out some metal bars they carry and pulled up a tarpaulin sheet over the camp's main charpoy, dumping all their belongings on the bed. We all sat huddled under the sheet, half soaked marveling at the storm that continued to come down around us. The women dug a trench around the camp to keep the water out. Everyone slept under the tent that night, two or three people to a charpoy.

The next day, the pastoralists found that these lands were not suitable to camp. The earth was wet and mucky, it was difficult to walk through for both the sheep and humans, and they were covered in mud. More stony soil and higher areas that would not retain water were more preferred in such circumstances.

1.1. Event as described by Natasha Maru

This opening anecdote from the Rabari pastoralists describes the ever-changing context that pastoralists adapt to on a daily basis, and the process of resilience

CONTACT L. Jamila Haider jamila.haider@su.se

*Present affiliation: ILRI- International Livestock Research Institute, Nairobi, Kenya.

Supplemental data for this article can be accessed online at <https://doi.org/10.1080/26395916.2024.2396928>

© 2024 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

emerging from relationships between each other, weather variability and landscape. Resilience is a concept that has the potential to capture on the one hand the vulnerability of pastoral communities, while on the other hand focusing also the innovative and adaptive capacities that enable pastoralists to deal with change. Resilience has become an increasingly influential concept in both scholarship and policy-making (Reyers et al. 2022). Resilience theory has evolved substantially from early definitions as ‘the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks’ (Walker et al. 2004, p. 2). Recently, some scholars working with resilience theory have sought to understand change through the relational networks within which entities ‘emerge’ and are constantly shaped and re-shaped (Hertz et al. 2020; West et al. 2020; Folke et al. 2021). It is argued that these understandings are more aligned with the goals of social justice, inclusive sustainability, and climate adaptation (Walsh et al. 2021). Hence, resilience thinking remains quite varied, with important discrepancies between theoretical advances and the application of theory in practice in sustainable development (Reyers et al. 2022). Numerous critiques of the application of resilience in development have pointed to how power asymmetries have allowed it to be applied in opportunistic ways (Grove 2018), how it can maintain structures of power (Brown 2015; Boonstra 2016; Coaffee and Chandler, 2017), and can expand the influence of neoliberal agendas in the face of rising uncertainty and compound stressors, often times responsibilising communities and individuals rather than states and institutions (Joseph 2013; Rigg and Oven 2015; Chandler and Reid 2016; Grove 2018). Distinct from its application in governance, the academic framing of resilience theory, has also faced a number of critiques that show how it has been regarded warily by a range of social scientists (Olsson et al. 2015). These include theories of human behaviour and social, political, and economic systems that have led to a tendency of resilience theory, which some argue is inherent to the way it conceptualises systems, to overlook systemic power relations (Côte and Nightingale 2012; Hatt 2013; Welsh 2014; Olsson et al. 2015). Alternative academic framings have recommended reconceptualisations to challenge dominant policy-making and open new opportunities (Macrae 2012; Leach et al. 2018), with some, attempting to incorporate power analysis (Boonstra 2016). Thus, resilience is perhaps best understood as multiple and contested, with key contrasts between different theoretical, analytical, applied, and normative goals (Grove 2018). Relatedly, the notion of ‘resilience multiple’ as put

forth by Simon and Randalls (2016), holds that there is no universal definition of resilience, and that different applications of the term have both different ontological underpinnings and also include normative implications, and so should be critically examined at their points of articulation (see also Konaka 2023). Grove (2018) suggests that resilience discourse, rather than merely serving as an apoliticizing narrative of control, also creates possibilities to open up new critical dialogues, as itself is conceptually malleable, and has potential for *becoming* ‘otherwise’ (see also Côte 2019, cf; Chandler 2014). While some have aligned their work (Wakefield 2020; Garcia et al. 2022; Gonda et al. 2023), others remain wary that resilience remains inherently wedded to neoliberal, managerial, functionalist roots (Watts 2019).

In this article, we suggest that approaches taking an epistemological focus on relations and processes, and centering ontological politics could help the concept of resilience meet its standing critiques and become ‘otherwise’. We explore how to do this in practice, through our methodologies as researchers. We build on recent sociology, anthropology, and scholarship on pastoralism to contribute to the ‘relational turn’ in sustainability science to address: how can an approach focused on processes and relations, and socio-ecological interdependence help us better understand resilience in pastoral landscapes? And vice versa: how can pastoralism offer insights about how to understand resilience starting from processes and relations? We compare different empirically grounded formulations of resilience that researchers operationalize in six pastoral case studies from Africa, Asia and Europe.

2. Conceptual framework: relational resiliences in pastoral contexts

We were inspired by our work on pastoral livelihoods and corresponding literature. As variability managers and innovators, pastoralists manoeuvre through complex environments comprised of ephemeral resources, climatic variations, and increasing connectivity across scales, from local, to regional to global politics, markets, or climates, which are interconnected dynamically (Nori 2019; Roe 2019). Since the 1980s there has been a large change of views of pastoral livelihoods, from being seen as ‘backward’, ‘irrational’, and environmentally destructive (Brown 1971; Lamprey 1983; Le Houérou 1989), to adaptive, opportunistic, and contributing a number of benefits to social-ecological systems (Chatty 1972; Fratkin 1997; Westoby et al. 1989; for a review of these changes and how they link with resilience studies, see: Konaka 2023). This shift of views was linked with changing ecological theory at the time, including

broader shifts in understanding ecosystem change through the lens of dynamical systems resilience (Holling 1973). More specifically equilibrium range-land ecological models moved to more dynamic ecological models that emphasised unpredictable and short-lived concentrations of resources (Vetter 2005; Briske et al. 2020), leading scholars of pastoral development to emphasise ‘variability’ as key to understanding pastoralist livelihoods (Krätli et al. 2013; Krätli 2015). The literature on pastoralism has since embraced opportunities to learn from pastoralists about how to live with change and to inform knowledge and decision-making in various parts of the world where tens of millions of pastoralists reside (Nori and Scoones 2019).

However, governments and international organisations often fail to recognise both the contributions of pastoralism to the environment and society (Manzano et al. 2021; Köhler-Rollefson 2023; Thompson et al. 2023) and the potentiality to learn from their knowledge and practices about how to manage variability (Roe 2019). This is seen prominently in the contradictions between understandings of variability in pastoralism as a resource, and ‘resilience building’ programmes in pastoral settings, that often see variability as an obstacle to stable production and attempt to control or minimise it (Semplici 2020; Semplici and Campbell 2023). For example, climate change narratives focused on desertification, typical of how resilience is applied in programmes in drylands by the development sector, can reinforce historical attempts to create stability in dryland environments that are inherently variable and dynamic (Ellis 1995; Hiernaux et al. 2016; Behnke and Mortimore 2016). Such narratives reiterate control-oriented measures (e.g. such as desotcking, green-belts, forest planting) and engineering solutions rather than working with the structural variability of drylands (Behnke and Mortimore 2016). Through mobile assets and livelihood strategies, pastoral communities are instead able to respond to and are indeed specialised to benefit from variability in their production strategies (Krätli and Schareika 2010) and as expert managers of reliable livelihoods under variable conditions through flexible and adaptive strategies (Roe et al. 1998; Roe 2019). Discussions about resilience in policy and development domains, in other words, risk limiting resilience to a purely instrumental narrative that justifies prescription of ‘top-down’ state and market-driven agricultural and rural development policies that favour alternative livelihoods, overlooking the ability of pastoral systems to respond to drought and other shocks (Cervigni and Morris 2016; Catley 2017).

In their review on progress towards applying resilience in policy and practice, Reyers et al.

(2022) assess six¹ shifts that are necessary for insights from resilience science to meaningfully support sustainable development in practice. One of the shifts Reyers et al. (2022) identify as the most challenging is to move from object-oriented thinking to viewing social-ecological systems (SES) as relationally constituted. Such a shift would add to discussions of a ‘relational turn’ in sustainability science (West et al. 2020), which proposes to advance social-ecological systems research by focusing on ways of knowing that are attuned to ‘processes and relations as the main constituents of reality instead of fundamental substances or essences’ (Mancilla Garcia et al. 2019, p. 221; Hertz et al. 2020). It is argued that such an approach fosters a move away from conceptual divisions between people and nature, society and ecosystems, to emphasise human-nature interdependence (West et al. 2020; Walsh et al. 2021). This also enables us to better consider situated and diverse knowledges, and a critical understanding of the implications of resilience discourses in decision-making (Simon and Randalls 2016; Grove 2018). Important to note is a rich indigenous scholarship and philosophy that long precedes ‘western’ relational thought (particularly in the realm of nature-society relationships), which already has a history of convergence with resilience (see for example Trosper 2002; Todd 2018). An approach to resilience that is informed by relational thinking could also create synergies with alternatives to dominant operationalisations in development practice through centering variability and rejecting control-oriented, technocratic approaches in favour of more tentative, adaptive, responses rooted in care (Scoones 2019; Scoones and Stirling 2021). The analysis that we present in the following section, informed by a way of producing knowledge (epistemology) that focused on processes and relations, brought to light insights that resonate with previous research that conceptualizes resilience as ever-unfolding and constantly in the re-making (Darnhofer 2020). However, through comparative work, it also shows how the process and relations underpinning resilience are multiple, that there are multiple beliefs about what exists (ontology), and in turn what pastoralisms and what resiliences are possible. Our analysis therefore also resonates with ‘political ontology’ perspectives (Blaser 2009, 2013) and thus encourages movement of knowing and conceptualizing pastoral resilience toward ‘a vision of multiple onto-epistemic formations, ineluctably co-constituted within power relations’ (Escobar 2017, p. 66). Resistant to ‘universal’ and ‘objective’ understandings of resilience, this points to the importance of ethnographically oriented, and politically reflexive approaches that situate ways of producing knowledge in socio-cultural and political

context (Simon and Randalls 2016; Grove 2018). Our attention turns to developing a comparative methodological approach for understanding the different enabling or constraining conditions in pastoral lifeways to *becoming* resilient.

In this article, we argue that taking an epistemic focus on social-ecological relations and processes, and focusing on processes of *becoming* (Deleuze and Guattari 1987; Haraway 2008), can centre resilience as inherently socially differentiated, asymmetrically influenced, and ontologically contested. We draw on a long history of thinking in anthropology, sociology, and science and technology studies that has focused on relational concepts of personhood, entanglement, and process to move beyond methodological individualism as well as the dichotomy of structure and agency (e.g. Emirbayer 1997; Latour 2005; Haraway 2008; Govindrajan 2018). An epistemology focused on these relations can overcome limitations inherent to approaches that have previously overlooked co-constitutive aspects of power and neglected wider political, economic, and social systems (Côte and Nightingale 2012). Our epistemic focus on relations was in particular informed by anthropology (Haraway 2008), which has eschewed tendencies to romanticise more-than-human interpretations of *becoming*. Such approaches show how systems of hierarchy, exclusion, neglect and violence are constitutive of more-than-human processes that are constitutive of identity (Govindrajan 2018). Drawing on relational approaches from new materialism and more-than-human approaches (Barad 2007; Haraway 2008) could enable resilience scholars to gain an enhanced ability to centre social, political, and economic dimensions of resilience that are often overlooked, enabling greater understanding of the complex, layered factors that enable or constrain resilience, while still sustaining a focus on normative concerns that could guide practical applications of resilience theory. We acknowledge also that pastoral communities have their own worldviews and ways of knowing resilience and uncertainty (Scoones 2023). In what follows we demonstrate how a focus on relationality can help clarify important processes that allow pastoralists to navigate variability and uncertainty at different scales of political, social, economic, and ecological organization; in other words, *becoming* resilient.

3. Methods

The core author team have each been working with pastoral communities and systems for over a decade, with different perspectives on resilience (we hold a range of views on its utility as a core conceptual tool, the above critiques of resilience theory, and its application in pastoral development). We came to

work together as post-doctoral researchers of the PASTRES project which asks, *What lessons can we learn for global challenges from pastoral systems responding to uncertainty?* What ties our experiences as independent researchers together is our fascination with pastoralists' ability to live 'with' uncertainty (Scoones 1995) and 'off' uncertainty (Krätschi and Schareika 2010) with vitality and liveliness, and the lack of power this response capacity had/has in development discourse (studies and policy).

This article draws lessons from pastoral practices in diverse settings as studied and researched by the PASTRES project researchers (Figure 1), including market dynamics in Sardinia, Italy (IT); moral economies in Isiolo, Kenya (KE); insurance systems in Borana, Ethiopia (ET); mobile practices in Gujarat, India (IN); rangeland governance in Amdo, Tibet, China (BO); and migration practices in southern Tunisia (TN). In this article, we unravel the system of meanings, interpretations, and emotions shared around the concept of resilience by the PASTRES project researchers, hereafter referred to as 'case study leads'. Their work and in-depth knowledge of the contexts and ongoing processes provides the empirical basis and data of the exploration of the concept of resilience in this article. In most cases, the case study leads are researchers from the case study contexts and have used ethnographic methods. Their role was tremendous in linking empirical experiences to the conceptual debates about resilience and ultimately in forging the arguments of this article around the urge of a relational approach in resilience theory and practice. The primary data for this paper is based on two workshops in which case study leads synthesised their ethnographic data from case studies from the PASTRES project of which all authors were a part of. Thus, the data collection reflects researchers views of resilience in the respective pastoral communities where they work.

During the first workshop (Figure 2), the core authors of this article and organizers of the two workshops, aimed to gather examples of applications of resilience by the case study leads, and in turn understand how they were operationalizing it in their everyday research practices. The workshop was held online and followed the distribution of a short open questionnaire to the case study leads about meanings and usages of resilience in their research experience. Four broad questions were asked to stimulate debate: 1) what is resilience? 2) what makes pastoralists resilient in each case? 3) what important relationships have allowed pastoralists to remain resilient through time in each case? and 4) what important changes through time have enabled or constrained resilience? The three core authors of this article, the six case study leads, and the two main investigators of the PASTRES project participated in the workshop.



Figure 1. Spatial distribution of six case studies from pastoral contexts.

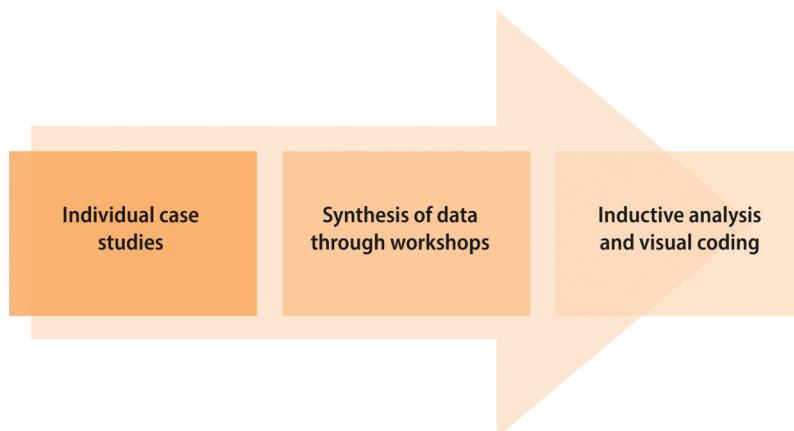


Figure 2. Overview of research methodology involving input from 6 different case studies, 2 synthesis workshops, inductive analysis and visual coding.

Our discussions sought to represent resilience through vernacular definitions within the various pastoralist contexts and to map these onto the ways they manifest in everyday life. Responses and conversations held during the first workshop were visually organized along spectrums of analysis, along which, we placed direct quotes from the responses to the questionnaire in overlapping bubbles, organised relative to their position along the spectrum ([Figures 3, 4, 5, 6](#)).

Following preliminary analysis of the resilience questionnaire and of the data gathered in the first workshop, we organised an in-presence workshop with the same

participants. During this second workshop, we aimed to explore methodological approaches intended to identify processes more explicitly, as we identified this as limited in the first workshop, and therefore focused on examples of *events* from the various cases to strengthen our joint reflections by means of more grounded and ethnographic material. Following Hertz et al. ([2020](#)), we defined *events* (Debaise [2017](#)) as temporary stabilizations in ever evolving interconnected processes. These recollections were drawn from case study leads' research with the intent of shedding light on quotidian, but complex social-ecological relations (Hertz et al. [2020](#)). The *events* are vignettes drawn from ethnographic analysis,

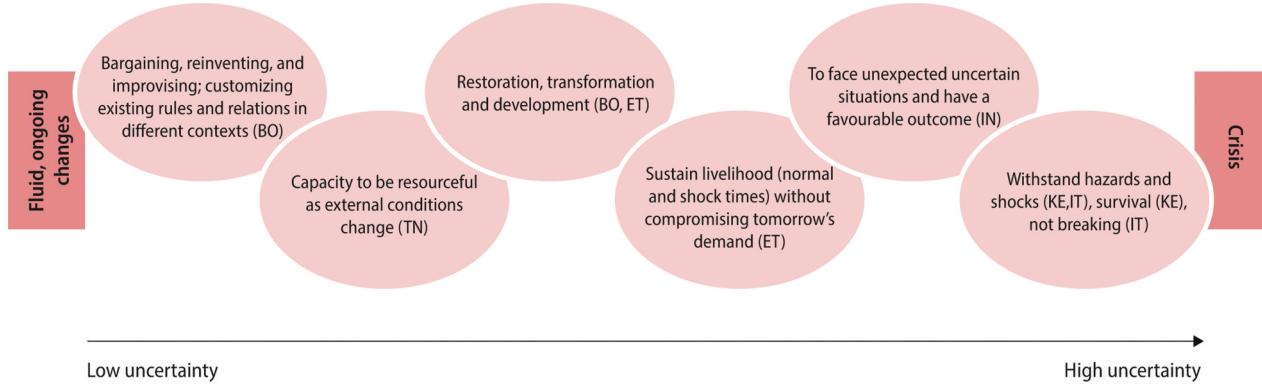


Figure 3. How is pastoralism understood? Spectrum 1: forms of responses to uncertainty.

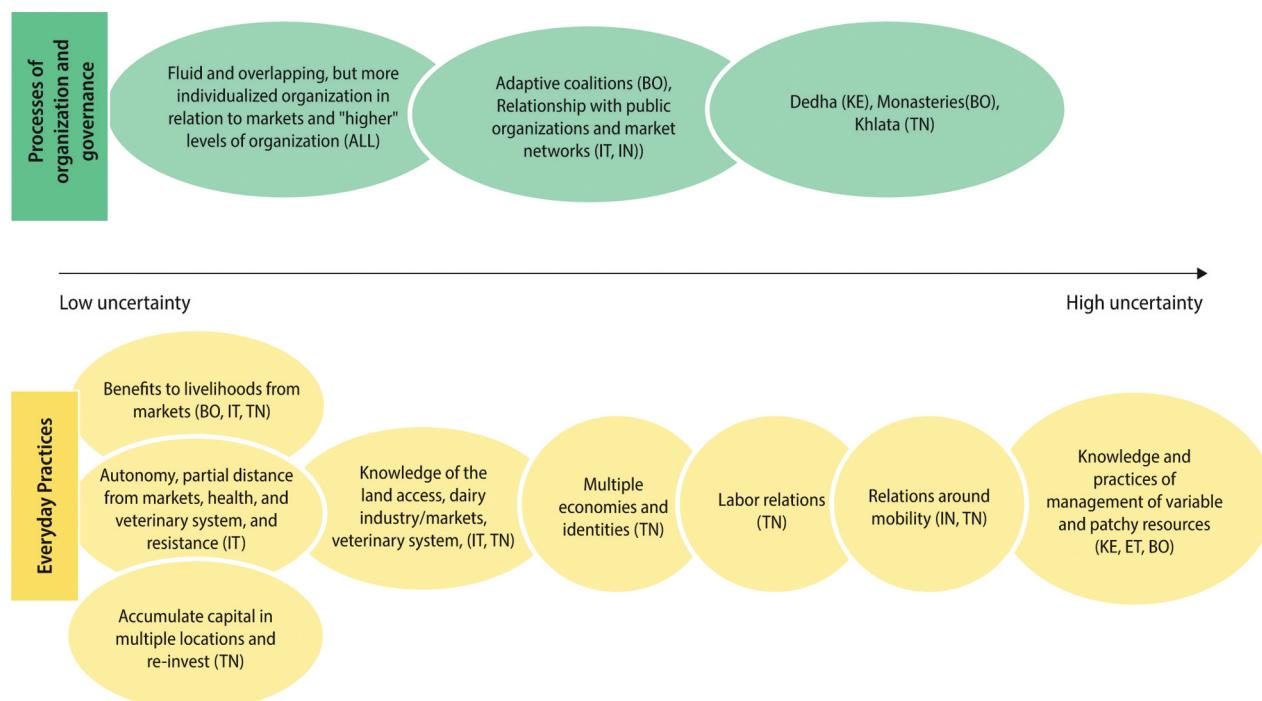


Figure 4. What makes pastoralism resilient? Spectrum 2: everyday practices and processes of organization and governance.

illustrating case study leads' perspectives on resilience in a time of stress, shock, or disturbance. Each case study lead was asked to: 1) Describe an event that is characteristic to the daily life of a pastoralist household in your case, and 2) Describe the same event in a situation of relative uncertainty, stress, or difficulty. Initial sketches of events from each case study site were shared for group discussion and then elaborated as 'event essays' (see appendix n.1 for full texts). The results of the 'event essays' are presented around three questions: What forms of compounded uncertainties are described? What processes were put in place to navigate those uncertainties? What relationships sustained those processes? In seeking an answer to these questions, a fourth dimension of analysis emerged on process-relationality, derived from Darnhofer's approach: 'A process-relational approach focuses on the relations between heterogenous elements, the relations that are constantly

made and remade, that could always be made differently, not least through different beliefs, values, perceptions, and expectations' (Darnhofer 2021, p. 2). In this way, we were able to add interpretive depth of these accounts beyond qualitative codes of 'relationships' and 'processes', and to explore how they might account for dynamic, holistic accounts of human-nature relationships.

The three first authors and core writing team led the analysis of both workshops through inductive approaches and visual coding (Figure 2). We experimented with visual codes by mapping codes graphically in two-dimensional space and applying different colours to different codes. Codes were refined iteratively while drawing from the ethnographically informed accounts, and arranging them in relation to each other. This process of coding produced fluid, overlapping codes that helped us to systematically

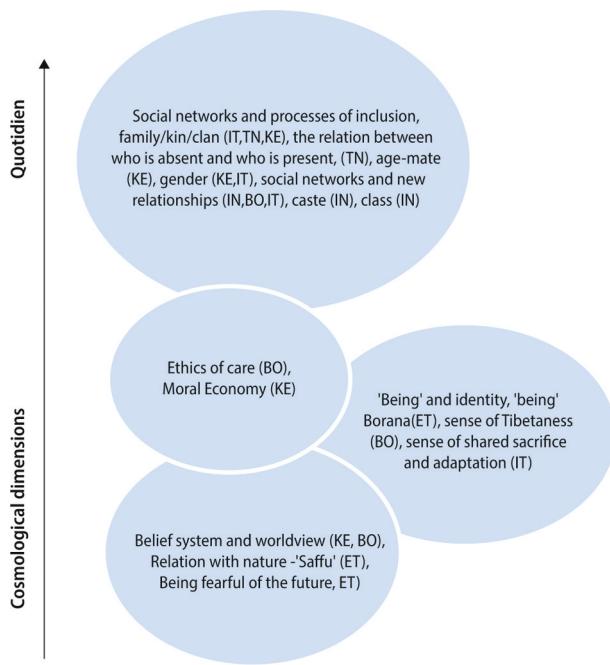


Figure 5. What important relationships have enabled resilience over time? Spectrum 3: socio-cultural dimensions.

map patterns of similarity and difference in the data until we agreed on a final diagram that summarised these accounts, while avoiding reductionism or over-generalization. These diagrams are presented in the following section and are to be intended as heuristic devices to simplify connections between multiple and overlapping responses.

4. Results: becoming resilient

4.1. The conceptual relationality of resilience

Diverse meanings and understandings of resilience emerged from the six different pastoral case studies.

Case study leads shared their field-based understanding of resilience, namely the ways they tended to conceptualise it from a grounded perspective, and what definitions they found most illustrative. Below, we elaborate on the discussions emerging from the first workshop, and the visual maps (Figures 3–5) of coded responses to each question. The visual maps are brought together in the final discussion section of this article (Figure 6).

4.1.1. What is resilience?

All responses relate resilience to uncertainty, albeit with varied understandings of uncertainty. The first spectrum of our analysis, at the left end, relates to low uncertainty, namely fluid, ongoing changes and micro transformations, those transformations that happen more or less consciously in daily life, in response to smaller spatial and temporal scales of uncertainty (Figure 3, Spectrum 1: Uncertainty). Definitions of resilience at this end of the spectrum include '*Bargaining, reinventing, and improvising from everyday life; as well as customizing existing rules and relations under different contexts*' (BO), implying the fluid nature of everyday practices in response to uncertainty. At the right end of Figure 3, resilience is defined as responses to more sudden, dramatic shocks involving relatively larger spatial scales and more abrupt changes (i.e. those that most commonly shape resilience debates in the development sector, and literatures on vulnerability). This includes the capacity to '*Withstand hazards and shocks*' (KE, IT), for '*Surviving*' (KE), and '*Without breaking*' (IT), in face of sudden, large, and spread disasters. One case study lead discussed both ends of this spectrum in their conceptualization of resilience, e.g. to '*Sustain livelihood (in both normal and shock periods) without compromising tomorrow's demand*' (ET).

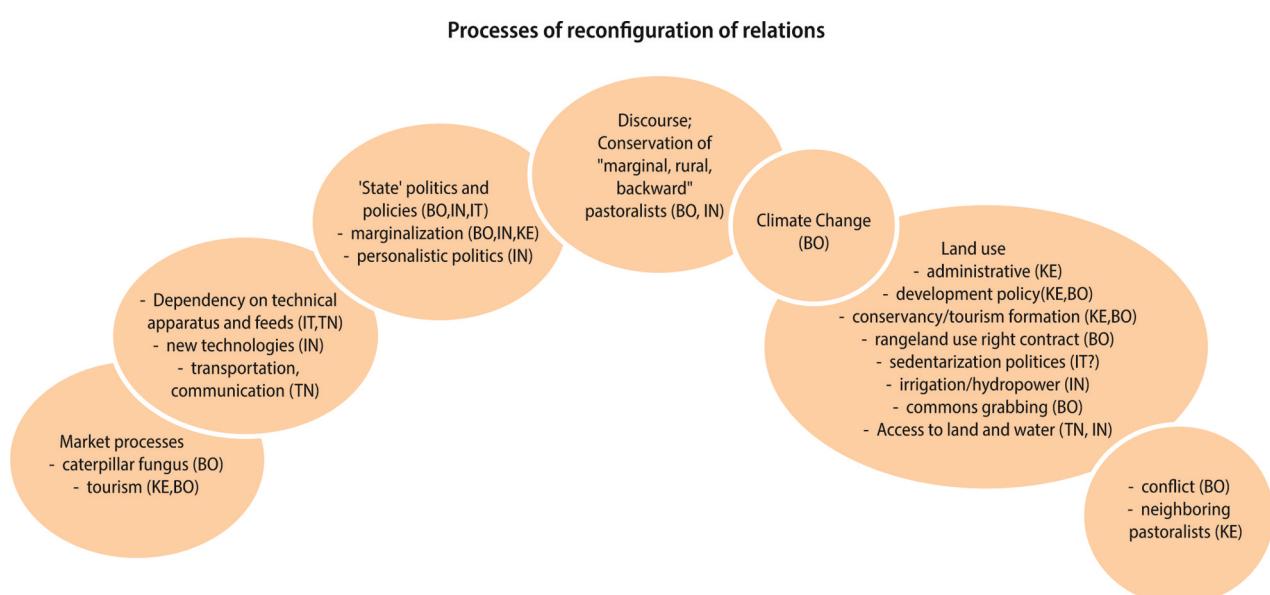


Figure 6. What important changes over time have enabled or constrained resilience? Spectrum 45: processes of reconfiguration of relations.

4.1.2. What makes pastoralists resilient?

Processes that contribute to pastoral resilience span from ‘everyday practices’ to ‘social organisation and governance’ (Figure 4). We placed responses along the same spectrum of low to high uncertainty that we introduced in Figure 3, read left to right.

At the level of ‘everyday practices’, local ingenuity, expertise, and knowledge emerged as important. These examples are grouped according to similarities in different dimensions of livelihood-making practices (including market engagements, labour arrangements, identity, and mobility relations) and other practices of resource management. On the left side of the spectrum of everyday practices, are market interactions and other ways of gaining benefits from market engagements, such as: ‘Accumulate capital in multiple locations and re-invest’ (TN), ‘Autonomy, partial distance from markets, health, and veterinary system, and resistance’ (IT), ‘Benefits to livelihoods from markets and formal organization’ (BO, IT, TN). These everyday strategies are opportunistic tactics for engaging with different organizations under changing conditions, and for sustaining benefits. Grounded knowledge and resourcefulness are necessary for strategically interacting with different social worlds (in both rural and urban domains) and for responding to the corresponding degrees of uncertainty. For example, cases from Italy and Tunisia underlined the importance of ‘Knowledge of the land access, dairy industry/markets, veterinary system’ (IT, TN). Also, from Tunisia and India, case study leads mentioned the ‘Ability to flexibly switch between different identities relative to economic contexts’ (TN), the capacity to ‘Weave articulated labour relations’ (TN), and ‘Processes that enable or create livelihood mobility’ (TN, IN). At the right end of this spectrum of everyday practices, corresponding to higher levels of uncertainty, are processes surrounding mobility and management of environmental variability, i.e.: ‘Relations around mobility’ (TN, IN), and ‘Knowledge and practices of management of variable and patchy resources’ (KE, ET, BO). Case study leads described all of these everyday practices as the backbone of resilience in the various cases.

Everyday practices are dependent on higher level processes of social organisation and governance. Processes of coalition, association, and politics emerged as crucial to be able to respond to different types of uncertainties. More individualised (left hand side Figure 4) practices correspond to lower amounts of uncertainty, as these require less structured responses, and more collective practices and negotiations (right hand side Figure 3) correspond to higher uncertainty. These include: adaptive coalitions (BO), market networks (IT, IN), sectoral institutions’ networks (IT, IN), and larger socio-cultural institutions (*dedha* (KE), *khlata* (TN), monasteries (BO).

4.1.3. What relationships have enabled resilience over time?

Everyday practices and processes of social organisation and governance are co-constituted by socio-cultural processes (Figure 5). These processes run along a spectrum from cosmological dimensions at the bottom to quotidian dimensions at the top, and all were reported to be important for all levels of uncertainty, from low to high, which is why the horizontal dimension is not present in Figure 5. At the top end of the spectrum, this includes relations among extended families and lineages, caste, clans, classes, age groups and gender relations. More-than-human relationships did not specifically come out at this stage of the first workshop, while undoubtedly relationships with livestock, wildlife, and the inhabited landscape take on a salient role in pastoral societies (Smart 2014). More-than-human relationships were however elicited by event narratives during the second workshop (see Section 4.2), which allowed case study leads to enrich and deepen their joint reflections. The lack of reference to more-than-human relations here highlights the constraints of thinking beyond the human realm without the explicit prompt to think in more relational terms (as with an event narrative).

Through the identified relationships knowledge is shared, transmitted, produced and reproduced (IT, KE, BO, ET); arrangements for mobility take place (IN, TN); labour is coordinated (TN, KE, ET, IN); access is negotiated (IT, IN) and multiple economies are woven together (TN). At the bottom of this spectrum are responses that specify dimensions of identity and cosmology, normally overlooked in resilience programming by the development sector (see also Semplici 2021). Feeling to be part of a group, e.g.: ‘*Being Borana*’ (KE), ‘*A sense of Tibetanness*’ (BO), or the acknowledged ‘*sacrifice*’ endured by pastoralists as a group (IT) reinforces relations and enables resilience. These dimensions of identity are conspicuous in gendered relations of care (IT), age-mate relations (KE), and around labour relations (TN), but also in the sense of shared identity related to belief systems and world views that formed the basis of specific practices, such as moral economy and support (KE, ET). The role of identity and cosmology in shaping people’s relationships and corresponding practices can be understood as relational values that emphasise interrelatedness of all beings and play an important role in stewardship, care and justice (Himes et al. 2024). We agree with Himes and colleagues that having a clear understanding of the different value types and the ways they are used advances the potential for a more pluralistic valuation of interventions in support of local populations (:38).

4.1.4. What important changes over time have enabled or constrained resilience?

Each case study lead framed resilience in relation to a wide range of observed changes that have occurred

in the context where they did research. These changes are visually coded as an overarching umbrella that influences all responses to uncertainty and resilience and are often described as representing new challenges and constraining the processes that underlie resilience. Yet, through everyday practices, social organization and governance, and socio-cultural processes, these new conjunctures enabled some to gain livelihood benefits. For example, market dynamics were highlighted as a major source of change, either in the form of market penetration in interior and remote pastoral lands, such as the boom of the caterpillar fungus economy in Amdo Tibet (BO), or through tourism (TN, KE). Technological changes, including 'enabling' factors such as improved communication and transportation services (TN) led to livelihood benefits in some cases, but 'constraining' factors such as increased dependency on technical apparatus (IT) were associated with loss of pastoral knowledge and autonomy in others. Land use changes were occurring in all case study sites; either through evolving land laws (BO), administrative boundaries and regulated borders (KE), development programming and land reconfiguration (KE, BO, TN), or through the establishment of 'no-go' zones such as conservancies and national parks (KE, BO), energy schemes (IN), or policies of sedentarisation (IT, ET). Through land use change, access to resources underwent changes in processes of inclusion and exclusion, with impacts on peoples' capacities to respond and navigate uncertainty, as well as impacts on the sustainable use of rangelands. Conflicts (BO) and clashes among neighbouring pastoral groups (KE) emerged as undermining the processes that underly resilience. These dimensions of change (market dynamics, technical advancement, land use, and conflict) link with broader processes related to state politics and policies (IT, IN, BO), political marginalization (IN, BO, KE), personalistic policies (IN), and process of climate change (BO).

4.2. Becoming resilient: analysing process-relationality through events

We now move to present the results of the second workshop, in which we analysed process-relationality through 'events' (see appendix n.1 for full texts, and Table 1 for a summary).

The *event* with Rabari pastoralists in Kachchh, Gujarat, India, partly reported in the opening anecdote, highlights how a pastoralist camp is made and remade through processes of animal lifecycles, seasonality of landscapes, land use relationships, and processes of exchange and shared labour. While moving between different sites with variable forage resources within a mosaic of harvested crop fields, open pastures and thickets of *Prosopis juliflora*

shrubs, uncertainties are compounded in the narrated *event* by a hailstorm that causes the need to set up camp immediately. This is quickly followed by flooding and wildlife predation of livestock. This *event* shows how the social configuration and materiality of the pastoralist camp emerges through a fluid process of continuous change within the camp as it moves in space and time, and through its negotiations of uncertainties in relation to farmers, rainfall, vegetation, and predators. In this example, we interpreted the camp as an unfolding process that is constantly making and remaking itself. In this *becoming*, humans craft and recraft the camp through their agency and coordination of labour, but the materiality of physical components in the camp and immediate environment also play a role, as do temporal fluctuations in rainfall, shrub growth, cropping cycles, and livestock life cycles. These processes of making and remaking the camp are also enabled or constrained through exchange and negotiations with land holders, as well as other socio-political factors, such as the larger resource politics that favors commercial agriculture over pastoralism. The pastoral camp is either enabled in *becoming* resilient, or is constrained as it encounters uncertainties (ranging from everyday uncertainty to sudden shocks such as the hailstorm).

Another *event* in Lumu, in Amdo Tibet in China, shows how pastoral livelihoods are continuously reconfigured over time in their interdependences between humans, livestock, pasture, and other non-humans (i.e. caterpillar fungus, Blue-sheep, Musk deer). However, the agency of actors such as tourists and urbanites in search of caterpillar fungus, as well as changes due to privatization of land are also influencing the ways that livelihoods are unfolding. These new relations are bringing different cosmologies, meanings, and ways of being that in turn have begun to create new uncertainties that can enable or constrain pastoralist relations with land. For example, pastoralists harvest fungi in a way that minimises damage to the rangeland, but non-locals do not follow these practices, as they are not concerned with the condition of the land for livestock. This creates new relations and processes where damage of land has become a possibility due to visitors harvesting caterpillar fungus in a way that does not recognize local institutions that have prevented damage in the past. In addition, new constraints on how relations with land arise are also apparent, e.g.: '*Some families in Lumu complained that they had to invest more money in pasture renting, and others claimed that increased investment in fodder purchasing due to the increase of deteriorated pastures from over-harvesting*'. Finally, structural change, in the form of a ban forwarded by monasteries and grounded

Table 1. Overview of case studies and events described.

| Case | Photo | Description (case lead, research project, data type) | 'Event' described | Main references |
|------------------------|-------|--|--|-------------------|
| Gujarat, India (IN) | | Natasha Maru, ethnographic study on Rabari pastoralists in Kachchh exploring unfolding relations around mobility | Data based on an ethnographic case from a pastoralist camp on the move | Maru (2022) |
| Sardinia, Italy (IT) | | Giulia Simula, study on Sardinian pastoralists in Sardinia on socially differentiated relations with markets and the economy. Data based on qualitative study, inc including semi-structured interviews, and participatory observation | NA | Simula (2022) |
| Douiret, Tunisia (TN) | | Linda Pappagallo, qualitative study, including visual methods in pastoral Douiret, exploring relations between migration, social differentiation, and capital accumulation. | NA | Pappagallo (2022) |
| Isiolo, Kenya (KE) | | Tahira Shariff Mohamed, key informant interview, in-depth narrative case studies, from pastoralist communities in Isiolo on moral economies | Data based on the illness of Diba in Isiolo, and the relations around care | Mohamed (2022) |
| Borana, Ethiopia (ET) | | Masresha Taye Tadesse, qualitative study, empirical cases collected from Borana pastoralists on insurance mechanisms | Data based on the case of Bokayo, a female pastoralist in Borana, the relation around mediation of market and supply network, labour dynamics within the household | Tadesse (2022) |
| Amdo Tibet, China (BO) | | Palden Tsiring, ethnographic study in a pastoral village on transforming governance institutions, changing relations with the land, and state-local power relations | Data based on the encounter between tourists and urbanites with pastoral communities and the consequences on land access and local cosmologies | Tsiring (2022) |

in cosmology, but also supported through a range of interventions intended to create awareness in individuals, was seen as needed to create enabling conditions for livelihoods *becoming* resilient.

In Isiolo, northern Kenya, the *event* shows how the pastoral social world is malleable, adjustable and responsive. The *event* describes the illness of Diba, the household head of a pastoralist family. The care shared by relatives and neighbours, the politics of charity engendered by government officials and aid agencies, and herding labour offered by relatives enabled processes of resilience for Diba, and therefore the entire family and herd during his illness. The emotional feelings of Diba following good rains in relation to the land and health of his reunited herd show that Diba's resilience is not just about responsiveness to and recovery from the stress and extreme challenge of his illness, which left him with medical bills and unable to care for his herd. His resilience instead results from long-term and everyday relations with family and friends that help care for him, help him pay for his treatment, and help him with herding

labour and care for his herd. These relations are examples of enabling processes of *becoming* resilient and as such constantly evolving. First, his health conditions change through time and reciprocal exchanges of livestock follow suit. Processes of wider community social support (*harambee*) evolve too, and are used in various ways to help him pay his medical bills and support his livelihood. Kinship is a particularly fluid unfolding process that is part of Diba's *becoming* and ability to be resilient. However, this *becoming* also includes community relations, and other personal relations, that mobilised resources at different times of need and uncertainty to help Diba remain a pastoralist.

Finally, in Borana, southern Ethiopia, the *event* highlights how Bokayo, a female herder, responds to uncertainties from variable rainfall, which can become limiting to processes of resilience when compounded with other socio-political constraints. Relational processes of resilience in this case are mediated by market and supply networks, labour dynamics within the household, and kin's support

and exchanges. As Bokayo explains, '*When rains fail, pasture and water shortage become a serious concern for all pastoralists*'. She relies on camel milk sales, but it is very challenging to cope with the resource scarcity for multiple reasons. This means she has to send her camel to distant areas. To do so, unfortunately, she has no older children and migrating requires experienced herdsmen. She has to take out her savings and hire a herder. '*This has a lot of risks*', she observes. The household herd and its resilience are therefore a process of *becoming* that unfolds through Bokayo's agency, knowledge/experience, and decisions about strategy and care with respect to her own relations about household economy markets, available feed, seasonality, herd splitting and forage resources.

5. Discussion: learning relational resilience from pastoralism

The need for a 'relational turn' within sustainability science and social-ecological systems more specifically has recently become well accepted (Preiser et al. 2018; West et al. 2020, Walsh et al. 2021; Hertz et al. 2020). This body of work seeks to move beyond the human-nature duality and cartesian reductionism that is often privileged in sustainability science, by centering a more pluralistic approach to considering diverse epistemologies and ontologies. While some conceptual progress has been made, the development of empirical approaches that apply a relational epistemology to account for how subjects and objects are dynamically co-constituted remains a challenge (as exemplified in the debate between West et al. 2020; Raymond et al. 2021). The framing and analysis in this paper grapples with how to do so in attempts to conceptualize relational resilience in an empirically grounded way. In analysing these cases, we struggled with drawing boundaries, creating codes and identifying emergent analytical categories. Through an iterative, collective, negotiated approach, we identified enabling processes that define resilience (workshop 1) that were then elaborated on through particular *events* (workshop 2). A common feature across all case studies, emerged during the first workshop, was the constant variability and uncertainty that pastoralists contend with, not just in moments of crisis, but in their everyday practices. This everyday acceptance of uncertainty fosters a higher capacity to respond to changes. Indeed, during workshop discussions, there was a more widely shared understanding that everyday uncertainty and constant fluxes of change foster adaptation and transformation.

In addition, during the first workshop we concluded that operationalizations of resilience only gain relevance or can be used to specify meaningful implications when discussed as situated within each specific context (see also Konaka 2023). What is more, the context of reference for one dimension of

resilience could not be separated from other dimensions, or separated into distinct categories of analysis such as everyday practices, socio-cultural dimensions, processes of social organisation and governance, or other ongoing changes. Rather, the emergent understanding that we reached emphasized that resilience could only be thought of in a meaningful way as occurring in relation to the constant interplay of all of these multiple dimensions that are all implicated as part of complex assemblages (Tozzi 2021). In other words, this initial analysis shows overall benefits of viewing resilience as itself a lens of inquiry and analysis, and as such, as conceptually relational, and a way of understanding relative, contextually dependent processes. Hence, when resilience is viewed universally, it neglects the multiplicities and contextualities that build resilience on the ground (Tozzi 2021). Further, this also supports conclusions that overly generalized applications of resilience are politically dangerous when their context of application is not specified (Simon and Randalls 2016). On the contrary, our analysis provides support for an operationalisation of resilience as situated and relational, in order to reflect, preserve, and enable the multiplicities of practices and experiences that are important to different people while navigating change.

We show such situatedness and relationality through a final visual map that brings together the visual codes we described in [Section 3](#) ([Figure 7](#)). These dimensions of resilience that emerged from workshop 1 are all characterised by different scales of variabilities (red horizontal line 'fluid ongoing changes' to 'Crisis') requiring constant reassembling of how to respond to change.

We found a relational approach to understanding resilience refocused our attention on the constant crafting and re-crafting of daily life, and different ongoing conceptualisations of what *being* and *becoming* resilient meant, which were meaningfully discussed only in relation to relative variabilities and uncertainties. Processes of *becoming* resilient emerged through everyday practices, social organization and governance, socio-cultural dimensions, as well as ongoing overarching processes of reconfiguration. Our mapping of relational resilience allowed us to converge on an empirically grounded understanding that simultaneously overcame theoretical limitations and our own personal discomfort as researchers with approaches to resilience that we felt had inadequately addressed issues of asymmetric social power, or that drew on social science that we found problematic that we describe in the introduction.

Through considering resilience with an epistemology focused on processes and relations, we examined resilience as dependent on context and the fluid overlapping of multiple domains (e.g. everyday practices,

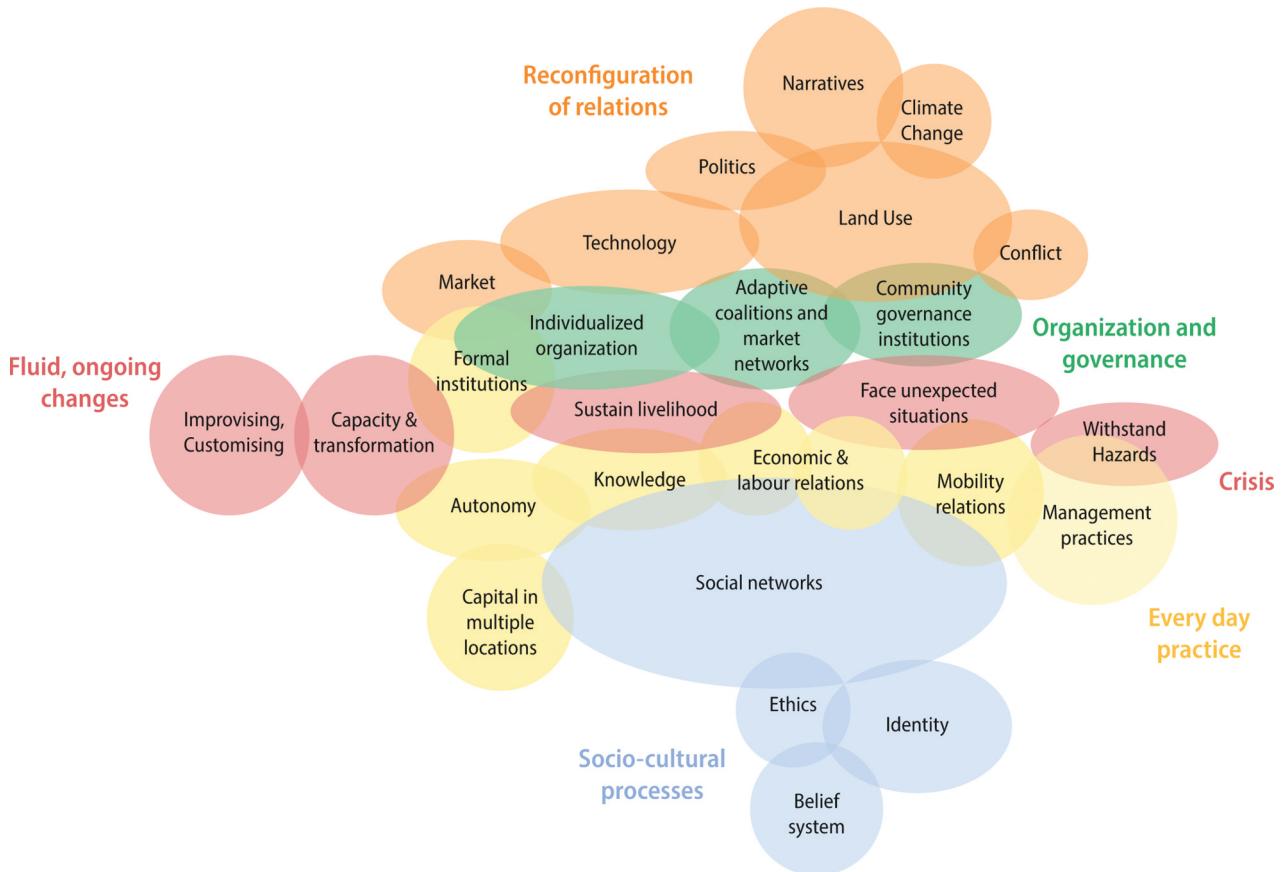


Figure 7. Conceptual relationality of resilience. Across the horizontal axis, the figure represents variability, moving from fluid ongoing changes to crisis. The constant re-assemblage of relations, socio-cultural processes and organisations and governance are represented around this variability.

socio-cultural dimensions, governance processes, Figure 7). This relational approach encouraged us to trace enabling or constraining processes of resilience within each case study and to conceptualise resilience in a way that varied depending on socio-cultural, economic, political and ecological dimensions relative to different scales of uncertainty experienced locally. Rather than merely concluding that context matters or that resilience is contingent, we were able to show how context and contingency underpin resilience across the different cases, which revealed multiple pastoralisms and resiliences, through an approach that could be applied systematically. Further, treating resilience as a relative concept that can only be understood in specific context helped us to clarify the question of resilience of what, to what in a way that counter-intuitively led to greater precision in understanding resilience. For example, in the case studies' emphasis on everyday practice, aspects which are not frequently addressed in resilience thinking, we were better able to understand how these practices were rooted in the possible relations and responses to uncertainty in each context, but also to understand how different interventions have limited or enhanced these different relations.

The *event* analysis based on the second workshop allowed us to expand the exploration of how moments

of being in different study contexts and how the possibilities of relations and processes in each could enable or constrain resilience. Our early attempts at coding were limited to 'process' and 'relationships', rather than 'process-relational' codes. However, by examining events as *becomings*, or dynamic processes that co-produced the seemingly discrete objects observed (e.g. a pastoralist camp in Gujarat, a household in Isiolo and Borana, a transforming Tibetan landscape), allowed for a more exploratory understanding of contextually specific factors underpinning resilience processes. For example, examining how a household herd is constantly taking form, how kinship and care allowed a pastoralist to sustain his livelihood while experiencing debilitating illness, and how a camp and a landscape are constantly subject to unfolding processes of change, helped us to grapple with the complexity of constant transformation and fluid adaptation in a way that enhanced our understanding of pastoralists' resilience. This also served to highlight the specific factors that constrained these *becomings*. While beyond the ability of our analysis here, these limitations are explored in greater depth in the underlying work that formed the basis of our analysis here, for example the ability to negotiate access to land in Gujarat (Maru 2022), gendered relations around knowledge and mobility in Borana (Tadesse 2022), and socially differentiated relations with markets in Sardinia

(Simula 2022). They are also seen in state interventions and processes of privatization of land in Tibet (Tsiring 2022, 2023), limitations of state social safety nets and the importance of moral economy in Isiolo (Mohamed 2022) and the relationship between migration, social differentiation, and capital accumulation in Tunisia (Pappagallo 2022, 2024). A focus on these *events* guided us toward a fluid, complex understanding of the ‘what’ in ‘resilience of what’ that crossed arbitrary boundaries that are often imposed around entities during analyses of resilience. *Events* also highlighted the embeddedness of pastoralists in processes of sharing land, labor, and livestock, and the ways of being together with kin, land, and non-humans. The use of and thinking through *events* was however not without its challenges. Case study leads expressed it to be frustrating to provide a snapshot, or slice an ever-unfolding process into a specific *event* for analysis. Likewise during analysis, we struggled to find a vocabulary as collaborators that could guide the process-relational analysis. The framing of resilience as the constant *becoming* of pastoralists, however, helped us frame and analyse the *events* in more fluid ways.

The approach we demonstrate here also has potential to highlight the often-debated synergies and dissonances between systems thinking and ‘critical’ social science (Turner 2014). An epistemic focus on relations, rather, enables multiple-scales of political, social, economic, and ecological dimensions to be considered in a fluid way. Attention to everyday practices allowed for a more fluid understanding of how different interventions often undercut the very practices and processes that enable pastoralists to adapt and transform their livelihoods in contexts of new uncertainties and constraints. A focus on relationality could also draw attention to complex causality in livelihood changes and resulting differential vulnerabilities; clarifying how multiple structural, ingrained factors translate into everyday outcomes. For example, in conceptualizing vulnerability, which is usually considered to be closely related to resilience (Adger 2006), socially differentiated shocks and stressors could be more fluidly considered as situated in specific social, political, and economic contexts with a relational epistemology (Ribot 2017). Applying a relational epistemology, as others have shown in studies of pastoral vulnerability, can clarify how vulnerabilities are socially differentiated, produced within specific political economic contexts, and often involve multiple compound social, political, and economic stressors that pastoralists face (Goldman and Riosmena 2013; Turner 2016; Unks et al. 2019), and help to clarify the ultimate causes of vulnerabilities. Thus, a relational approach to understanding resilience may open new avenues of dialogue that center commonly under-emphasized structural dimensions such as social and political

power as constitutive of relative abilities to adapt and respond to uncertainty. The next step we ought to see in future research, in contrast to a responsibilizing resilience, is to link relational approaches to a political ontology framing of ‘care’ (Simon and Randalls 2016), aligning with recent work on relational values (Himes et al. 2024), enabling a centering of the preservation of relations that are important to plural ways of being (Escobar 2017) and resonates with similar framings of ‘care’ in pastoral development (Scoones 2023).

Conclusion

In this article, we focused on understanding how researchers view resilience through their ethnographic projects with pastoral communities in different geographic and thematic contexts, including market dynamics in Sardinia, Italy; moral economies in Isiolo, Kenya; insurance systems in Borana, Ethiopia; mobile practices in Gujarat, India; rangeland governance in Amdo, Tibet, China; and migration practices in southern Tunisia. Through an iterative and negotiated approach using ethnographic data across the six cases, a relational approach to resilience demonstrated potential to address the complexity underlying pastoralist livelihoods in a way that could help define interventions that support rather than undermine pastoralists’ resilience. This suggests that a radically transdisciplinary approach where collaboration between systems thinkers, ethnographers, and pastoralist experts themselves is needed to understand the multiple ways that pastoralism exists and how this contrasts with academic and development ontologies. This closely resonates with views of the relationship between resilience and a political ontology-informed approach to design (Escobar 2017; Grove 2018), bringing together distinct and ‘non-computable’ forms of knowledge, with a relational approach to resilience that is more attuned to the ethnographic, but also an ability to consider different knowledge systems as inherently situated in socio-cultural and political contexts.

Note

1. 1) From capitals to capacities, 2) from objects to relations, 3) from outcomes to processes, 4) from closed to open systems, 5) from generic interventions to context sensitivity, and 6) from linear to complex causality (Reyers et al. 2022).

Acknowledgements

We express our gratitude to the PASTRES research programme that reunited us all and gave a home to scholars working on pastoralism, allowed us to exchange ideas, and to continue giving voice to pastoralists across the world. We are

grateful to the pastoral communities in Tibet, India, Ethiopia, Kenya, Italy, and Tunisia who hosted the case study leads, and greatly contributed to the development of this article.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Additional information

Requisite ethical procedures were followed regarding EU guidelines.

Author responsibilities

GS, RU and LJH comprised the core writing team, and together led the conceptualisation, data collection, analysis and writing of the manuscript. The six case study leads were involved in both workshops and wrote case studies (appendix A) which comprised the primary data for this research.

Funding

This work was supported by the PASTRES (Pastoralism, Uncertainty, Resilience: Global Lessons from the Margins) programme under Advanced Grant funding from the European Research Council [Grant agreement No. 740342]. It was also supported by the National Socio-Environmental Synthesis Center (SESYNC) under funding received from the National Science Foundation DBI-1639145.

ORCID

Greta Semplici  <http://orcid.org/0000-0002-1509-5650>
 L. Jamila Haider  <http://orcid.org/0000-0002-0265-5356>
 Ryan Unks  <http://orcid.org/0000-0002-8216-7570>
 Tahira S. Mohamed  <http://orcid.org/0000-0002-9455-800X>
 Palden Tsering (Huadancairang)  <http://orcid.org/0000-0001-9543-831X>

References

- Adger WN. 2006. Vulnerability. *Global Environ Change*. 16(3):268–281. doi: [10.1016/j.gloenvcha.2006.02.006](https://doi.org/10.1016/j.gloenvcha.2006.02.006).
- Barad K. 2007. Meeting the universe halfway: quantum physics and the entanglement of matter and meaning. Durham (NC): Duke University Press.
- Behnke R, Mortimore M, editors. 2016. The end of desertification?: disputing environmental change in the Drylands. Springer. [10.1007/978-3-642-16014-1](https://doi.org/10.1007/978-3-642-16014-1).
- Blaser M. 2009. Political ontology: cultural studies without ‘cultures’? *Cult Stud*. 23(5–6):873–896. doi: [10.1080/09502380903208023](https://doi.org/10.1080/09502380903208023).
- Blaser M. 2013. Ontological conflicts and the stories of peoples in spite of Europe: toward a conversation on political ontology. *Curr Anthropol*. 54(5):547–568. doi: [10.1086/672270](https://doi.org/10.1086/672270).
- Boonstra WJ. 2016. Conceptualizing power to study social-ecological interactions. *Ecol Soc*. 21(1):art21. doi: [10.5751/ES-07966-210121](https://doi.org/10.5751/ES-07966-210121).
- Briske DD, Coppock DL, Illius AW, Fuhlendorf SD, Niu K. 2020. Strategies for global rangeland stewardship: assessment through the lens of the equilibrium–non-equilibrium debate. *J Appl Ecol*. 57(6):1056–1067. doi: [10.1111/1365-2664.13610](https://doi.org/10.1111/1365-2664.13610).
- Brown K. 2015. Resilience, development and global change. London: Routledge.
- Brown LH. 1971. The biology of pastoral man as a factor in conservation. *Biol Conserv*. 3(2):93–100. doi: [10.1016/0006-3207\(71\)90007-3](https://doi.org/10.1016/0006-3207(71)90007-3).
- Catley A. 2017. Pathways to resilience in pastoralist areas: a synthesis of research in the Horn of Africa. Boston: Feinstein International Center.
- Cervigni R, Morris M. 2016. Confronting drought in Africa’s Drylands: opportunities for enhancing resilience. Washington, DC: World Bank Publications.
- Chandler D. 2014. Beyond neoliberalism: resilience, the new art of governing complexity. *Resilience*. 2(1):47–63. doi: [10.1080/21693293.2013.878544](https://doi.org/10.1080/21693293.2013.878544).
- Chandler D, Reid J. 2016. The neoliberal subject: resilience, adaptation and vulnerability. Lanham, Maryland, US: Rowman & Littlefield.
- Chatty D. 1972. Pastoralism: adaptation and optimization. *Folk*. 14–15:27–38.
- Coaffee J, Chandler D, editors. 2017. Introduction: contested paradigms of international resilienceThe Routledge handbook of international resilience. Abingdon and NY: Routledge; p. 1–11.
- Côte M. 2019. Politicizing the will to adapt: towards critical resilience studies? *Dialogues Hum Geogr*. 9(2):189–192. doi: [10.1177/2043820619827718](https://doi.org/10.1177/2043820619827718).
- Côte M, Nightingale AJ. 2012. Resilience thinking meets social theory: situating social change in socio-ecological systems (SES) research. *Prog Hum Geogr*. 36(4):475–489. doi: [10.1177/0309132511425708](https://doi.org/10.1177/0309132511425708).
- Darnhofer I. 2020. Farming from a process-relational perspective: making openings for change visible. *Sociologia Ruralis*. 60(2):505–528. doi: [10.1111/soru.12294](https://doi.org/10.1111/soru.12294).
- Darnhofer I. 2021. Farming resilience: from maintaining states towards shaping transformative change processes. *Sustainability*. 13(6):3387. doi: [10.3390/su13063387](https://doi.org/10.3390/su13063387).
- Debaise D. 2017. Nature as event: the lure of the possible. Durham: Duke University Press.
- Deleuze G, Guattari F. 1987. A thousand plateaus: capitalism and schizophrenia.
- Ellis J. 1995. ‘Climate variability and complex ecosystem dynamics: implications for pastoral development’. In living with uncertainty: new directions in pastoral development in Africa. London: Institute of Development Studies.
- Emirbayer M. 1997. Manifesto for a relational sociology. *Am J Sociol*. 103(2):281–317. doi: [10.1086/231209](https://doi.org/10.1086/231209).
- Escobar A. 2017. Designs for the pluriverse: radical interdependence, autonomy, and the making of worlds. Durham, USA: Duke University Press.
- Folke C, Haider LJ, Lade SJ, Norström AV, Rocha J. 2021. Commentary: resilience and social-ecological systems: a handful of frontiers. *Global Environ Change*. 71:959–3780. doi: [10.1016/J.GLOENVCHA.2021.102400](https://doi.org/10.1016/J.GLOENVCHA.2021.102400).
- Fratkin E. 1997. Pastoralism: governance and development issues. *Annu Rev Anthropol*. 26(1):235–261. doi: [10.1146/annurev.anthro.26.1.235](https://doi.org/10.1146/annurev.anthro.26.1.235).
- Garcia A, Gonda N, Atkins E, Godden NJ, Henrique KP, Parsons M, Zier vogel G. 2022. Power in resilience and resilience’s power in climate change scholarship. *Wiley Interdiscip Rev: Clim Change*. 13(3):e762. doi: [10.1002/wcc.762](https://doi.org/10.1002/wcc.762).



- Goldman MJ, Riosmena F. 2013. Adaptive capacity in Tanzanian maasailand: changing strategies to cope with drought in fragmented landscapes. *Global Environ Change: Hum Policy Dimens.* 23(3):588–597. doi: [10.1016/j.gloenvcha.2013.02.010](https://doi.org/10.1016/j.gloenvcha.2013.02.010).
- Gonda N, Flores S, Casolo JJ, Nightingale AJ. 2023. Resilience and conflict: rethinking climate resilience through indigenous territorial struggles. *J Peasant Stud.* 50(6):2312–2338. doi: [10.1080/03066150.2022.2161372](https://doi.org/10.1080/03066150.2022.2161372).
- Govindrajan R. 2018. Animal intimacies: interspecies relatedness in India's Central Himalayas. University of Chicago Press. <https://press.uchicago.edu/ucp/books/book/chicago/A/bo28301734.html>.
- Grove K. 2018. Resilience. Routledge. [10.4324/9781315661407](https://doi.org/10.4324/9781315661407).
- Haraway DJ. 2008. When species meet. Minneapolis: University of Minnesota Press.
- Hatt K. 2013. Social attractors: a proposal to enhance “resilience thinking” about the social. *Soc & Nat Resour.* 26(1):30–43. doi: [10.1080/08941920.2012.695859](https://doi.org/10.1080/08941920.2012.695859).
- Hertz T, Mancilla Garcia M, Schlüter M, Muraca B. 2020. From nouns to verbs: how process ontologies enhance our understanding of social-ecological systems understood as complex adaptive systems. *People Nat.* 2(2):328–338. doi: [10.1002/pan3.10079](https://doi.org/10.1002/pan3.10079).
- Hiernaux P, Dardel C, Kerfoot L, Mougin E. 2016. Desertification, adaptation and resilience in the Sahel: lessons from long term monitoring of agro-ecosystems 147–178. [10.1007/978-3-642-16014-1_6](https://doi.org/10.1007/978-3-642-16014-1_6).
- Himes A, Muraca B, Anderson CB, Athayde S, Beery T, Cantú-Fernández M, González-Jiménez D, Gould RK, Hejnowicz AP, Kenter J, et al. 2024. Why nature matters: a systematic review of intrinsic, instrumental, and relational values. *BioScience.* 74(1):25–43. doi: [10.1093/biosci/biad109](https://doi.org/10.1093/biosci/biad109).
- Holling CS. 1973. Resilience and stability of ecological systems. *Annu Rev Ecol Syst.* 4(1):1–23. [10.1146/annurev.es.04.110173.000245](https://doi.org/10.1146/annurev.es.04.110173.000245).
- Joseph J. 2013. Resilience as embedded neoliberalism: a governmentality approach. *Resilience.* 1(1):38–52. doi: [10.1080/21693293.2013.765741](https://doi.org/10.1080/21693293.2013.765741).
- Köhler-Rollefson I. 2023. Hoofprints on the land: how traditional herding and grazing can restore the soil and bring animal agriculture back in balance with the earth. London, UK: Chelsea Green Publishing.
- Konaka S. 2023. Reconsidering resilience in African pastoralism. Towards a relational and contextual approach. Greta Semplici, and Peter D. Little, editors. Tokyo: Trans Pacific Press.
- Krätsli S. 2015. *Valuing variability: new perspectives on climate resilient drylands development.* International Institute for Environment and Development; IIED; [accessed 2023 July 3]. from <https://www.iied.org/10128iied>.
- Krätsli S, Huelsebusch C, Brooks S, Kaufmann B. 2013. Pastoralism: a critical asset for food security under global climate change. *Anim Front.* 3(1):42–50. doi: [10.2527/af.2013-0007](https://doi.org/10.2527/af.2013-0007).
- Krätsli S, Schareika N. 2010. Living off uncertainty: the intelligent animal production of dryland pastoralists. *Eur J Devel Res.* 22(5):605–622. doi: [10.1057/ejdr.2010.41](https://doi.org/10.1057/ejdr.2010.41).
- Lamprey H. 1983. Pastoralism Yesterday and Today: the overgrazing problem. In: Bourlière F, editor. *Tropical savannas, ecosystems of the world.* Vol. 13, Amsterdam; Oxford: Elsevier; p. 643–666.
- Latour B. 2005. Reassembling the social: an introduction to actor-network-theory. Oxford, UK: Oxford University Press.
- Leach M, Reyers B, Bai X, Brondizio ES, Cook C, Díaz S, Espindola G, Scobie M, Stafford-Smith M, Subramanian SM. 2018. Equity and sustainability in the anthropocene: a social–ecological systems perspective on their intertwined futures. *Global Sustainability.* 1:e13. doi: [10.1017/sus.2018.12](https://doi.org/10.1017/sus.2018.12).
- Le Houérou HN. 1989. The grazing land ecosystems of the African Sahel. *Ecol Stud.* 75:99–109.
- Macrae J. 2012. The continuum is dead, long live resilience. *NGO Voice.* 15.
- Mancilla Garcia M, Hertz T, Schlüter M. 2019. Towards a process epistemology for the analysis of social-ecological systems. *Environ Values.* doi: [10.3197/096327119X15579936382608](https://doi.org/10.3197/096327119X15579936382608).
- Manzano P, Burgas D, Cadahía L, Eronen JT, Fernández-Llamazares Á, Bencherif S, Holand Ø, Seitsonen O, Byambaa B, Fortelius M, et al. 2021. Toward a holistic understanding of pastoralism. *One Earth.* 4(5):651–665. doi: [10.1016/j.oneear.2021.04.012](https://doi.org/10.1016/j.oneear.2021.04.012).
- Maru N. 2022. Haal haal ne haal [Walk, walk and walk]: exploring the pace of pastoral mobility among the Rabari pastoralists of western India [Doctoral]. University of Sussex. <https://sro.sussex.ac.uk/id/eprint/1099771>.
- Mohamed TS. 2022. The role of the moral economy in response to uncertainty among Borana pastoralists of Northern Kenya, Isiolo County [Doctoral]. University of Sussex. [http://sro.sussex.ac.uk/id/eprint/1104721](https://sro.sussex.ac.uk/id/eprint/1104721).
- Nori M. 2019. Herding through uncertainties – principles and practices. Exploring the interfaces between pastoralists and uncertainty. Results from a literature review. *EUI working papers RSCAS* 2019/69. 58.
- Nori M, Scoones I. 2019. Pastoralism, uncertainty and resilience: global lessons from the margins. *Pastoralism.* 9(1):10. doi: [10.1186/s13570-019-0146-8](https://doi.org/10.1186/s13570-019-0146-8).
- Olsson L, Jerneck A, Thoren H, Persson J, O'Byrne D. 2015. Why resilience is unappealing to social science: theoretical and empirical investigations of the scientific use of resilience. *Sci Adv.* 1(4):e1400217. doi: [10.1126/sciadv.1400217](https://doi.org/10.1126/sciadv.1400217).
- Pappagallo L. 2022. “Partir pour Rester?” to leave in order to stay? The role of absence and institutions in accumulation by pastoralists in Southern Tunisia [Doctoral]. University of Sussex. [http://sro.sussex.ac.uk/id/eprint/109122/](https://sro.sussex.ac.uk/id/eprint/109122/).
- Pappagallo L. 2024. Recasting tenure and labour in Non-equilibrium Environments: making the case for ‘high-reliability’ Pastoral Institutions. *Land Use Policy.*
- Preiser R, Biggs R, De Vos A, Folke C. 2018. Social-ecological systems as complex adaptive systems: organizing principles for advancing research methods and approaches. *Ecol Soc.* 23(4). [accessed 2023 Sep 22]. <https://www.jstor.org/stable/26796889>.
- Raymond CM, Kaaronen R, Giusti M, Linder N, Barthel S. 2021. Engaging with the pragmatics of relational thinking, leverage points and transformations – reply to west. *Ecosyst People.* 17(1):1–5. [10.1080/26395916.2020.1867645](https://doi.org/10.1080/26395916.2020.1867645).
- Reyers B, Moore M-L, Haider LJ, Schlüter M. 2022. The contributions of resilience to reshaping sustainable development. *Nat Sustainability.* 5(8):657–664. doi: [10.1038/s41893-022-00889-6](https://doi.org/10.1038/s41893-022-00889-6).
- Ribot J. 2017. Vulnerability does not just fall from the sky: addressing the vulnerability conundrum. In: Kasperson RE, editor.

- Risk conundrums: solving unsolvable problems. Taylor and Francis; p. 224–242. doi: [10.4324/9781315665894](https://doi.org/10.4324/9781315665894).
- Rigg J, Oven K. 2015. Building liberal resilience? A critical review from developing rural Asia. *Global Environ Change*. 32:175–186. doi: [10.1016/j.gloenvcha.2015.03.007](https://doi.org/10.1016/j.gloenvcha.2015.03.007).
- Roe E. 2019. A new policy narrative for pastoralism? Pastoralists as reliability professionals and pastoralist systems as infrastructure. STEPS working paper 113. Brighton: STEPS Centre.
- Roe E, Huntsinger L, Labnow K. 1998. High-Reliability Pastoralism Versus Risk-Averse Pastoralism. *J Environ & Devel*. 7(4):387–421. doi: [10.1177/107049659800700404](https://doi.org/10.1177/107049659800700404).
- Scoones I. 1995. Living with uncertainty: new directions in pastoral development in Africa. London: Institute of Development Studies.
- Scoones I. 2019. What is uncertainty and why does it matter? STEPS working paper (IDS) 56.
- Scoones I. 2023. Confronting uncertainties in pastoral areas: transforming development from control to care. *Soc Anthropol/Anthropologie Sociale*. 31(4):57–75. doi: [10.3167/saas.2023.04132303](https://doi.org/10.3167/saas.2023.04132303).
- Scoones I, Stirling A. 2021. The politics of uncertainty: challenges of transformation. Abingdon: Routledge.
- Semplici G. 2020. Resilience in action. Local practices and development/humanitarian policies. A review of resilience in the drylands of Turkana. London: Research and Evidence Facility (REF).
- Semplici G. 2021. Resilience and the mobility of identity: belonging and change among Turkana herders in Northern Kenya. *Nomadic Peoples*. 25(2):226–252. doi: [10.3197/np.2021.250204](https://doi.org/10.3197/np.2021.250204).
- Semplici G, Campbell T. 2023. The revival of the drylands: Re-learning resilience to climate change from pastoral livelihoods in East Africa. *Clim Devel*. 15(9):1–14. doi: [10.1080/17565529.2022.2160197](https://doi.org/10.1080/17565529.2022.2160197).
- Simon S, Randalls S. 2016. Geography, ontological politics and the resilient future. *Dialogues Hum Geogr*. 6 (1):3–18. doi: [10.1177/2043820615624047](https://doi.org/10.1177/2043820615624047).
- Simula G. 2022. Pastoralism 100 ways: navigating different market arrangements in Sardinia [Doctoral]. University of Sussex. <http://sro.sussex.ac.uk/id/eprint/109485/>.
- Smart A. 2014. Critical perspectives on multispecies ethnography. *Critique Anthropol*. 34(1):3–7. doi: [10.1177/0308275X13510749](https://doi.org/10.1177/0308275X13510749).
- Tadesse MT. 2022. Financialisation of risk among the Borana pastoralists of Ethiopia: practices of integrating livestock insurance in responding to risk [Doctoral]. University of Sussex. <http://sro.sussex.ac.uk/id/eprint/109001/>.
- Thompson L, Rowntree J, Windisch W, Waters SM, Shalloo L, Manzano P. 2023. Ecosystem management using livestock: embracing diversity and respecting ecological principles. *Anim Front*. 13(2):28–34. doi: [10.1093/af/vfac094](https://doi.org/10.1093/af/vfac094).
- Todd Z. 2018. Refracting the state through human-fish relations: fishing, indigenous legal orders and colonialism in North/Western Canada. *Decolonization: Indigeneity, Educ & Soc*. 7(1):60–75.
- Tozzi A. 2021. An approach to pluralizing socionatural resilience through assemblages. *Prog Hum Geogr*. 45 (5):1083–1104. doi: [10.1177/0309132520983471](https://doi.org/10.1177/0309132520983471).
- Trosper RL. 2002. Northwest coast indigenous institutions that supported resilience and sustainability. *Ecol Econ*. 41(2):329–344. doi: [10.1016/S0921-8009\(02\)00041-1](https://doi.org/10.1016/S0921-8009(02)00041-1).
- Tsering P (Huadancairang). 2022. Institutional hybridity: rangeland governance in Amdo, Tibet [Doctoral]. University of Sussex. <http://sro.sussex.ac.uk/id/eprint/106349/>.
- Tsering P. 2023. Tibetan Buddhist monastery-based rangeland governance in Amdo Tibet, China. *Land Use Policy*. 131:106756. doi: [10.1016/j.landusepol.2023.106756](https://doi.org/10.1016/j.landusepol.2023.106756).
- Turner MD. 2014. Political ecology I: an alliance with resilience? *Prog Hum Geogr*. 38(4):616–623. doi: [10.1177/0309132513502770](https://doi.org/10.1177/0309132513502770).
- Turner MD. 2016. Climate vulnerability as a relational concept. *Geoforum*. 68:29–38. doi: [10.1016/j.geoforum.2015.11.006](https://doi.org/10.1016/j.geoforum.2015.11.006).
- Unks RR, King EG, Nelson DR, Wachira NP, German LA. 2019. Constraints, multiple stressors, and stratified adaptation: pastoralist livelihood vulnerability in a semi-arid wildlife conservation context in Central Kenya. *Global Environ Change*. 54:124–134. doi: [10.1016/j.gloenvcha.2018.11.013](https://doi.org/10.1016/j.gloenvcha.2018.11.013).
- Vetter S. 2005. Rangelands at equilibrium and non-equilibrium: recent developments in the debate. *J Arid Environ*. 62(2):321–341. doi: [10.1016/j.jaridenv.2004.11.015](https://doi.org/10.1016/j.jaridenv.2004.11.015).
- Wakefield S. 2020. Urban resilience as critique: problematizing infrastructure in post-sandy New York City. *Political Geogr*. 79:102148. doi: [10.1016/j.polgeo.2020.102148](https://doi.org/10.1016/j.polgeo.2020.102148).
- Walker B, Holling CS, Carpenter S, Kinzig A. 2004. Resilience, adaptability and transformability in social-ecological systems. *Ecol Soc*. 9(2). doi: [10.5751/ES-00650-090205](https://doi.org/10.5751/ES-00650-090205).
- Walsh Z, Böhme J, Wamsler C. 2021. Towards a relational paradigm in sustainability research, practice, and education. *Ambio*. 50(1):74–84. doi: [10.1007/s13280-020-01322-y](https://doi.org/10.1007/s13280-020-01322-y).
- Watts MJ. 2019. Resilient planet: some remarks on Kevin Grove, resilience. *Dialogues Hum Geogr*. 9(2):186–189. doi: [10.1177/2043820619826798](https://doi.org/10.1177/2043820619826798).
- Welsh M. 2014. Resilience and responsibility: governing uncertainty in a complex world. *Geogr J*. 180(1):15–26. doi: [10.1111/geoj.12012](https://doi.org/10.1111/geoj.12012).
- West S, Haider LJ, Stålhammar S, Woroniecki S. 2020. A relational turn for sustainability science? Relational thinking, leverage points and transformations. *Ecosyst People*. 16 (1):304–325. doi: [10.1080/26395916.2020.1814417](https://doi.org/10.1080/26395916.2020.1814417).
- Westoby M, Walker B, Noy-Meir I. 1989. Opportunistic management for rangelands not at equilibrium. *J Range Manag*. 42(4):266–274. doi: [10.2307/3899492](https://doi.org/10.2307/3899492).