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# The revival of the drylands: re-learning resilience to climate change from pastoral livelihoods in East Africa

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## ABSTRACT

Drylands, seen from the outside world, fall in the imaginary of the remote, the deserted, the unproductive; a powerful imaginary rooted in romantic narratives, as well as in political and economic interests. In this article, we review different waves of rural politics and development in the East African drylands, with a particular focus on Kenya's arid and semi-arid lands, in the context of climate change. We question the re-awakening of international and national attention paid to the drylands under the all-embracing framework of 'resilience building'. Unfortunately, tensions between climate change policies and local knowledge and practices remain. We show how such renewed attention retains old myths about drylands and leaves little space to the agency of pastoral communities that live in these territories, and what are the implications of mislead development efforts. On the contrary, we suggest learning from pastoral practices to unravel theoretical and policy alternatives.

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Pastoralism; climate change; resilience; development



## Introduction

Resilience thinking is pervasive in scholarly and policy circles (Korosteleva, 2019; Xu & Marinova, 2013). Its etymological origin lies in the Latin verb *resilio*, to jump back (Klein et al., 2003), but its meaning has since expanded widely across several disciplines and fields of enquiry. Despite, or perhaps because of, its popularity, there is little agreement in the vast resilience scholarship about its meaning in practice: how resilience can be promoted and sustained, and how it can be operationalized remain contested questions. Nonetheless, with its promise of positive adaptation, resilience has become a 'key political category of our time' (Neocleous, 2013, p. 3), endorsed by policymakers and the aid industry as the principal driver of much recent policy and programming.

Mobilized by a large and diverse number of epistemic communities, resilience grew from the corners of ecology, engineering, and psychology to now hold up against the development challenges posed by the increasing surprise and shocks that confront a globalized and interconnected world (Grove, 2018; Welsh, 2014), one above all others: climate change. In this regard, the promise of resilience is particularly compelling. Resilience offers itself as the governance of last resort, the last card to play before we reach the limits of our planet. The once stable, predictable environment of the Holocene has been replaced by the advance of the Anthropocene (Chandler et al., 2020). It thereby follows that the modernity pursuit of command-and-control, of human superiority over the non-human, of centralization and forecasting, is no longer tenable as it harms more than it saves the planet. Initially

thought of through a set of properties of systems and entities to anticipate, adapt, and recover from shocks by resuming original configurations, shapes, and functional relationships (Walker & Salt, 2012), scholars have more recently welcomed transformative theories of resilience encouraging change and more dynamic processes of 'bouncing forward' (Folke et al., 2010; Manyena, 2006; Shaw, 2012).

While the difficulty of resilience in addressing issues of power, human agency or inequity has led many to question the utility of the concept in development (Bahadur et al., 2010; Cannon & Müller-Mahn, 2010), there is little doubt that resilience has now become an 'all-embracing mobilizing metaphor' (Pain & Levine, 2012, p. 21) for many actors, not least in relation to the drylands of East Africa.<sup>1</sup> However, as shown in this article, and argued by a burgeoning literature, many of these actors seem to be intent on promoting existing agendas, namely growth, productivity and efficiency and have brought little change in development practice, objectives, and mindsets (Brown, 2012; Chandler, 2020). Drawing on two separate research projects undertaken individually by the authors, one examining the significance and local meanings of resilience among Turkana herders in northern Kenya's arid lands (Semplici, 2020a), the second looking at environmental and development policy processes relevant to pastoral dryland areas in Ethiopia and Kenya (Campbell, 2021), this article reflects on the rise of programmes and debates about resilience and climate change in the context of drylands, with a particular focus on Kenya's arid and semi-arid lands (ASAL). For this article, we rely on our experience with development in the

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East African drylands based on long term ethnographic fieldwork, for what concerns our knowledge of pastoral livelihoods, and on in-depth content and discourse analyses of a sample of climate change and drylands development policy documents for what concerns our claims about policy narratives. The article argues that debates about climate change have brought drylands back onto the international stage after years of donor fatigue. And yet despite major theoretical and policy re-evaluations of the socio-ecological dynamics occurring in the drylands, problems at implementation level remain rooted in old mindsets and assumptions that are difficult to eradicate, while economic and political interests proliferate. The real power of the revival of the drylands may then instead be placed in the lessons to be learnt from drylands' populations who, net of political and institutional constraints, have lived and prospered in highly volatile and uncertain terrains. The article suggests rethinking current practices of resource management and the ways we understand environmental change in drylands to an approach and perspective that is more inclusive of local perceptions and knowledge, and respects local practices.

The article starts by unpacking resilience discourses concerning environmental and climate change, highlighting the potential role of drylands. We then review the history of development interventions in the drylands, from colonial times to the present day, emphasizing the unfortunate reiteration of actions and mindsets. Against the challenges posed by climate change, the scholarly and development literature is polarized. We identify a paradox of representation as scholars portray pastoralists as one of the most resilient groups, while practitioners tend to see them as the most vulnerable. We examine these two positions and maintain that the promise of resilience of pastoralism fails largely because of the wider political and economic constraints that limit the possibilities for pastoralism to thrive through, and thanks to, uncertainty, more than because of the impacts of climate change. We conclude by emphasizing how pastoral livelihoods and dryland environments could help us re-learn resilience and find solutions to climate change.

### Resilience and environmental change in the Anthropocene, a change of perspective

That the climate is changing is unequivocal. The landscape, the environment, the places we inhabit are changing too. The 6th Intergovernmental Panel on Climate Change (IPCC) Assessment Report (Ranasinghe et al., 2021) predicts that global warming will reach plus 1.5°C by 2040, or earlier. Beyond these thresholds, a global catastrophic scenario is prefigured, one referred to as 'runaway climate change'. Under these predictions, critical tipping points will be increasingly hit, and planet Earth may become unliveable for most of humankind. During the process of reaching those tipping points, the burden of risk and sacrifice will not be equally shared across the human population (IPCC, 2022). Climate change affects drylands through increased temperatures and more irregular rainfall, with important differences between areas with different rainfall distributions linked to the dominant climate systems in each location (Ranasinghe et al., 2021). While some drylands will expand by 2100, not all will experience an increase in aridity. While predictions of future climate impacts carry

some uncertainty, the IPCC WGII assert, with medium confidence, that above 2°C global warming, meteorological drought frequency will increase and duration will double from 2 to 4 months over North Africa, the western Sahel and southern Africa (IPCC, 2022). And with high confidence, that the frequency and intensity of heavy rainfall events will increase at all levels of global warming (except in North and southwestern Africa), increasing exposure to pluvial and riverine flooding. While this evidence for climate change resulting in surface-level warming would appear to be incontrovertible, the consequences for pastoral production in drylands of Africa are less clear. Impacts pertaining to rangeland vegetation, herd dynamics and herd composition are thus likely to be varied, site-specific and uncertain (Herrero et al., 2016; Sloat et al., 2018). One concern is that increased frequency of droughts will allow insufficient time for herd recovery in the years when there is no drought (Enns & Bersaglio, 2015). Climate change is also likely to bring more frequent and intense disease outbreaks in both crop and livestock systems (Kumssa & Jones, 2010; Herrero et al., 2016). The most acute aspect of drought in pastoralist areas is the reduction in the availability of fodder for livestock (Browne et al., 2017). The 2017 drought across much of the Greater Horn of Africa region followed lower-than-average precipitation across the 2016 rainy seasons, with devastating results the following year (Anyadike, 2017). In Kenya this event put at least 20% of the country's pastoralists in need of humanitarian assistance (UNOCHA, 2017). A similar pattern is emerging in 2022, where parts of Northern Kenya and neighbouring countries face a third successive year of drought. The primary response among pastoralists in the face of climate risk and other uncertainties is to move. Yet, as we shall see later in this article, access by pastoralists in Northern Kenya (and elsewhere in East Africa) to dry-season 'drought reserves' in less arid areas is increasingly restricted as these lands are targeted for agricultural schemes, wildlife conservancies, green energy projects and other investments (Campbell, 2021; Rodgers, 2022).

Much of the current state of our planet is imputed to the application of human science and technology directed at control and command over nature, thought of as separate and distinctive (Chandler et al., 2020). That is, the climate uncertainty we now face is not as simple as any other crisis, but a sign that modernity was a false promise of progress, civilization, and development. It is no longer possible to evade our shared responsibility in the production of the same problems we now face. This is the Anthropocene, when there is no longer an inside (human) and outside (non-human, nature, environment), a local and a global, a traditional and a modern and when environmental problems are the product of capitalistic human activity (Fraser, 2021). Hence, scientists are calling for a fundamental rethink of our relationship with nature and resource management through, for example, alternative agriculture and food production systems and moving beyond the dependence on high-energy inputs and fossil fuels (Krätli et al., 2022).

Resilience, it is claimed, offers such a chance. Resilience emerged as a policy framework and influential governance principle alongside the growing recognition that the stable and predictable environment many attributed to the Holocene was untenable. In the Anthropocene, human actions have

long-term consequences that ‘stick with us’ (Chandler, 2020, p. 50) and undermine natural processes of regulation, including climate change. In this domain, resilience is proposed as theory and practice to slow down the runaway climate process by advocating transformative change in social and economic practices (Folke et al., 2010) and performing alternative state-society-environment relations (Grove, 2018; West et al., 2020).

Without a doubt, in the past decade we have observed a spectacular rise in the usage of the term applied in a wide range of policy and popular media, and especially to the field of global environmental change (Brown, 2014). The ODI Resilience Scan signals discussions on risk reduction and climate change among those in which resilience thinking is most prevalent (Kirbyshire et al., 2017). Many international organizations promote resilience as a means to link development to environmental change (see for example, the Human Development Report 2007, the World Bank’s Programme for Climate resilience 2008; Osman, 2018; World Bank, 2019; IPCC, 2022). Common to most deployments is the invocation of a crisis, especially since the World Conference on Disaster Reduction through the Hyogo Framework for Action (HFA) 2005–2015 made community and national resilience its ultimate goal; a goal which was re-launched in the post-2015 agenda at the World Conference on Disaster Risk Reduction (WCDRR) through the Sendai Framework for Disaster Risk Reduction 2015–2030 (SFDRR).

Scholars of disasters, among others, have however warned against an uncritical use of resilience. Since the Hyogo and Sendai frameworks, increasing emphasis has been placed on individual and community capacities to live with vulnerabilities. The risks faced by these approaches are to normalize, and, especially for climate change processes, naturalize crises, casting them as of natural origin and sweeping under the carpet the legacy and ongoing pressures of capitalistic relations and political stressors (MacKinnon & Derickson, 2013). Critics sustain that through resilience programming, ‘therapeutic development’ came to dominate, focussing on managing the effects of poverty and vulnerability by enabling and capacity building, rather than eradicating them (Chandler, 2020; Grove, 2018). This approach not only diverts attention and resources from real drivers of vulnerability (Bracke, 2016) and downplays questions of power and politics (Scott-Smith, 2018), as often sustained by critics of resilience, but most critically, it is argued, it directly contributes to the problems of resource depletion (Chandler, 2020). In these ‘soft’ approaches, there is, in other words, a lack of understanding of the limits of our planet, of current approaches of resource management and extraction, while problems remained framed as external in search of internal solutions, through adaptive capacities, in order to maintain our existing modes of living.

Critics of resilience maintain that there is no soft policy that can address climate change today. Time has come to address the system of responsibilities and share the burden of risks and sacrifices. And this cannot take place without facing the context of capitalism and colonialism imbued in most development and climate action (Borras et al., 2022). More alarmingly, there is no climate resilience with a runaway climate, as most likely there will not be any planet to be resilient on. As argued by Krätli et al.: ‘climate resilience is conditional to avoiding

catastrophic global warming’ (2022, p. 1). Only once global warming has been stopped, by changing our production systems, does climate resilience become crucial to face the unprecedented climate variability humanity has already started to experience (Ranasin, 2021).

Under these premises and allying with a burgeoning literature (Borras et al., 2022; Catley et al., 2013; Nori & Scoones, 2019), we sustain that we may have a lot to learn from those who are forging a livelihood in ecologically and politically variable contexts. That is, the drylands and pastoral communities. The scientific community today in fact recognizes variability, in both time and space, as a key feature of drylands. Variability entails that key resources, such as nutrients and water for livestock, can be relied on in the form of unpredictable and short-lived concentrations (Krätli et al., 2013). In these contexts, vegetation and water resources, as well as other resources beyond the socio-ecological realm (aid, market prices, development programmes), are usually ephemeral in time and patchy in space (Reid et al., 2014). Pastoralism developed to benefit from the distinct agro-ecological and socio-physical characteristics of open ranges, specializing in highly variable and unpredictable resource endowments (Nori & Davies, 2007), through, for example, herd flexibility, diversity, and mobility (Fratkin, 1997). Communities in African drylands hence are already experiencing and managing highly variable environments and extreme weather conditions, as those that are disclosing in front of our eyes. And they do so by making only negligible use of external inputs based on fossil fuels. They are among the most efficient in the world in sustainably producing human-edible proteins (FAO, 2021) and making use of variable resources without aggravating fossil fuel consumption (Krätli et al., 2022), while keeping producing reliably (Roe, 2020; Roe et al., 1998).

So, yes, climate is changing, but under the umbrella shade of acacia trees in the drylands of north Kenya, this is a long-established truth. Groups of elders reunited in village meetings, or women gathered around wells, children playing with the shadows of clouds in the lowlands, have always discussed, scrutinized, and responded to the various formations of clouds overhead, to the sprouts of vegetation that flower and shrivel at different times in different places, as well as to the oscillations of market prices or aid. And even now that climate change has intensified its unpredictability, they are finding ways to benefit dynamically from uncertainty. Hence, by studying and enabling pastoral livelihoods, we could not only learn a different relationship with the environment, and ways to manage variability, but also support a tenable production system without speeding up the process of arrival at the earth’s planetary boundaries. If this is not resilience, then what is? Yet, as reviewed below, the characteristics of dryland environments and the adaptive behaviour of pastoral populations have long been the subject of major misconceptions that have seen new life since the rise of climate change concerns, in turn missing a chance to learn resilience to climate change, while making local livelihoods more vulnerable than they were (Lind et al., 2020).

### The revival of the drylands: theory and practice of pastoral development

Drylands are composite landscapes, made of deserts, grasslands, savannas and woodland biomasses (Mortimore, 2009).



Drylands cover over 40% of the earth's land surface, provide 44% of the world's cultivated systems and 50% of the world's livestock, and are home to more than two billion people (IUCN, 2017). A large part of these people engages in extensive livestock husbandry. That is, communities who rely on herds of domesticated livestock, which they graze on communal, open rangelands. In Africa only, pastoral systems support the livelihoods of about 100 million people. Here, despite chronic under-investment (AU, 2010; Nori, 2022), pastoralism's contribution to agricultural GDP averages 40%, often including meat for both domestic markets and exports (Krätli et al., 2022). Other contributions of pastoral systems lie in water efficiency and the provision of ecosystem services and biodiversity, creating and maintaining mosaic landscapes and habitats. Pastoralism ensures that a human presence is maintained in harsh terrains and remote communities, thus helping avert socio-economic desertification, with relevant implications for the cultural heritage and territorial identity of local communities (Nori & Farinella, 2020).

While the primary characteristic of drylands is to be home of low and erratic precipitation, they are also highly heterogeneous. Climate conditions range from hyper-arid to subhumid and vary considerably in rainfall variability. Years of high rainfall may be followed by years with very little rainfall. Soil characteristics and fertility also show highly varied spatial patterns. Most of these variations go unnoticed to the untrained eye, or, worst, they are fought against to stabilize and homogenize the environment in the name of increased productivity. Indeed, the history of development in the drylands is one of little innovativeness, continued misrepresentations, and overlapping agendas and interests.

During colonial administrations in sub-Saharan Africa, privilege was addressed at the agrarian highlands. Alternatively, especially in the Sahel and parts of central Africa, interests in the peripheral drylands were largely skewed towards the commercial value of livestock production, entailing large fencing schemes, coercive settlement of nomadic pastoralists, and the introduction of livestock taxes (Dyson-Hudson, 1991). Rising preoccupations with the 'creeping of the Sahara' were largely attributed to the exploitative behaviour of pastoral populations, considered responsible for the progressive degradation of the environment, because of their limited knowledge, irrational behaviour, and tendency to 'over-stock' and 'over-graze' (Bovill, 1921).

Drought events between the end of the 1970s and the beginning of the 1980s, social tensions, and degradation of range resources in certain areas across the Sahel paved the way for the 1977 UN International Conference on Desertification (UNCOD), providing further legitimation for policies and programmes aimed at readdressing extensive mobile livestock systems towards more rational, productive, and sedentary livelihoods (Nori, 2022). At the base of these narratives, there was a general understanding of ecosystems at equilibrium, developed in relatively stable and temperate ecosystems. This view belonged to a 'range succession model' (Clements, 1916) for which, in the absence of grazing, each rangeland has a single equilibrium state, called 'climax', achieved through a steady process of vegetation successions, and corresponding to a well-defined 'carrying capacity'<sup>2</sup> (Westoby et al., 1989).

Exceeding the ecosystem carrying capacity was considered the primary source of degradation in arid and semi-arid lands, largely imputed to pastoralists and their herds because of livestock mismanagement (Brown, 1971; Lamprey, 1983; Le Houérou, 1989). It was argued that pastoralists accumulate livestock more for their social value and prestige than for subsistence or economic reasons, known as the 'cattle complex', first discussed by Herskovits (1926). In addition, in the absence of private property regimes or state regulations, the social desire to increase herd size was understood as leading to overgrazing and desertification. This case was presented by Hardin (1968) in his article 'The tragedy of the commons'.

Hardin's thesis had significant influence on public attitudes towards pastoralist land-use systems and provided the rationale for sweeping privatization and commercialization of livestock production, as well as the large extension of cropping especially in western and central Africa. Swift (1996) argued that the 'desertification narrative' had become widely accepted because it served the interests of groups of policy actors. In the 1970s, newly independent African governments were restructuring their bureaucracies and seeking to gain central control over natural resources. Droughts, and the assumptions about human-induced degradation linked to them, legitimized such claims and made centralized top-down planning seem a logical strategy (Swift, 1996). For many policymakers in the post-independence period, pastoralists and livestock mobility was associated with a primitive past, soon to be replaced by economic development and progress (Turner & Schlecht, 2019), through the control of variability. Strategies were oriented towards the modernization of the livestock sector by means of enhanced livestock productivity, commercialization, fencing lands, controlling herds, and increasing integration into national markets and regional trade (Nori, 2022).

In the 1980s and 1990s, limitations emerged in the use of equilibrium models, first in ecology science prompted by the work of C.S. Holling (1961) and colleagues. As new resilience thinking was rising in ecology theory, concepts such as 'carrying capacity' and 'vegetation climax' could no longer be used to describe the ecological behaviour of drylands. Strong fluctuations in dryland ecologies were observed regardless of density related processes, indicating that an equilibrium point was hard to find and maintain (Behnke et al., 1993; Ellis & Swift, 1988; Niamir-Fuller, 1999; Sandford, 1983; Scoones, 1995; Westoby et al., 1989). Uneasiness with equilibrium models meant a shift in the theoretical underpinnings of rangeland ecology drawing from emerging concepts of complexity and resilience (Mortimore, 2009). Various alternative models have since been proposed<sup>3</sup> around the concept of non-equilibrium and merged in a 'New Rangeland Paradigm'. These new models allowed a different understanding of drylands as 'resilient' (Ellis & Swift, 1988): non-equilibrium but persistent ecosystems. Fast variations of vegetation structure, ground cover, and precipitation, corresponding to the concentration and dispersal of livestock, started being framed in terms of 'variability' and were increasingly treated as structural features of drylands, with no stability state to return to or climax to achieve (Krätli, 2015). Perspectives towards local production strategies, such as pastoralism, which in equilibrium models appeared as chaotic, irrational, or disruptive, now made

sense in terms of land use based on herd flexibility, diversity, and mobility (Fratkin, 1997).

Over the last 20 years, these shifts have reached the attention of policymakers (AU, 2010; FAO, 2021, 2022; IFAD, 2018; IUCN, 2012; UNDP, 2011, the Transhumance Protocol promoted by IGAD in 2020, regional declarations such as the N'Dajema and Nouakchott declarations in 2013, the rise of the 'pastoral codes' in West Africa: Mauritania 2000, Mali 2001, Burkina Faso 2003, Niger 2010, see also Nori, 2022; Flintan et al., 2022). Following a period that Scoones (1995) called a 'pastoral crisis',<sup>4</sup> renewed interest towards drylands grew in policymaking circles, largely following increasing concerns about climate change, growing food and political insecurity, and the urge to 'build resilient communities' to extreme weather events. A marking point was the severe drought experienced across the Horn of Africa (HoA) in 2010/11 and the regional and international response that followed (Little & McPeak, 2014; Semplici, 2020b). National governments and the international community scaled up their presence in drylands (especially in Africa) calling for a paradigm shift in the approach to drylands' development: 'building resilience'.<sup>5</sup> However, despite over 40 years of major re-evaluations of classical assumptions around the behaviour of drylands, these are still treated as inherently problematic, while resilience rises as a new paradigm to resolve emerging issues.

### The promise of pastoral resilience

The 'promise of resilience' (Aradau, 2014; quoted in Grove, 2018) engenders us to survive, and prosper, and thrive in front of compounded crises. In the drylands, pastoral livelihoods gave evidence to this promise through time. As a theatre of extreme weather conditions and variations, the drylands are an important stage from which to learn resilience. Pastoralists have, after all, been managing environmental variability and adapting autonomously to climate variability and other uncertainties in Africa for millennia (Ericksen et al., 2013; McGahey et al., 2014). Since the rise of the New Rangeland Paradigm, we have learnt the many ways through which pastoralists have specialized in operating with uncertainty, rather than by externalizing it. These strategies consist in embedding variability in their production practices, in the operational processes and institutional arrangements so as to match uncertain conditions and maintain relative stability of food production. Foremost, the capacity to make use of mobility to reach dispersed, patchy, and volatile resources at the right time, as well as the institutional means and customary social organizations available to make mobility possible by favouring negotiation, complementarity, and integration over exclusivity, competition and separation (Krätli et al., 2022). For example, communal land tenure systems, seasonal patterns of crop-livestock, and wide social relations across livelihood groups. Additionally, the 'liquid logic' of the herd (Pappagallo, 2022) is also critical in supporting pastoral systems in variable contexts. The herd functions as a dynamic and fluid entity that can be divided, subdivided, discarded, reassembled, and reorganized according to contextual conditions (Nori, 2019). These strategies, among others, allow pastoralists to keep their options open,

and to remain flexible and attentive to changes in their surroundings.

Climate change, it is claimed, is destabilizing these practices. Against the challenges posed by climate change, a large part of the development literature views pastoralists as one of the most vulnerable groups (Alinovi et al., 2010; IPCC, 2022), and one resorting to 'negative coping strategies' – cattle-raiding, joining militant groups, 'illegal grazing' inside areas set aside for conservation – so having a 'maladaptive' effect on others (Cervigni & Morris, 2016). That climate and environmental change are leading to vicious cycles of poverty, violence, and further environmental degradation, might not necessarily be always explicit in the language adopted in policy reports, it is certainly the message we receive by assessing the types of interventions and policy prescriptions promoted under the resilience and climate change agenda in the drylands. For example, in Kenya:

- Increased mechanization of agriculture and intensification/commercialization of livestock production<sup>6</sup>;
- Irrigation schemes (such as the one-million-acre *Galanna Kulalu* irrigation and food security scheme in Tana River County – reported to have dispossessed lands previously used by minority agro-pastoralists and, according to several reports, has largely proved to be an expensive failure)<sup>7</sup>;
- Infrastructure development, including investment in hydro, geothermal and wind energy – Lake Turkana Wind Power (LTWP) in Kenya being a notable example – more often serving to restrict pastoralists from prime grazing areas and traditional livestock routes (Drew, 2020; Campbell, 2021);
- Education programmes through literacy, training and certification (the Resilience and Economic Growth in the Arid Lands-Improving Resilience Programme, REGAL-IR, for example, funded training courses on business and financial management through a Community Resilience Empowerment Fund; training for agro-pastoralists on new technologies for irrigation infrastructure such as cemented canals; vocational training for individuals, in particular boat making, tailoring and hairdressing; and training on fodder management, selection, use and preservation) (Semplici, 2020b).

These programmes might differ from what is being promoted elsewhere in Africa where a long history of exchanges with crop-livestock farmers in sub-humid areas for example prevail (IOM, 2019; Krätli & Toulmin, 2020); however similarly in all these contexts, while arguably giving a new (and welcomed) impetus to pastoral development, the new resilience language promoted within the development sector in drylands reiterates old assumptions and myths (Catley et al., 2013; Campbell, 2021). The language adopted in the humanitarian/development sphere is, in fact, still one of 'fragility', 'coping', and 'scarcity', while pastoralism remains largely characterized by 'narratives of deficit' (Krätli, 2013; Krätli et al., 2015) struggling through a difficult environment, equally in various part of the African continent and beyond. Legal frameworks continue to deny customary rights (Abbink et al., 2014; AU,

2010), as most governments still see pastoral land as empty, degraded, unproductive, and ‘in need of development’. Despite the rise of transhumance agreements in Eastern and Western Africa (Nori, 2022), nation state borders and conflicting policies continue to hamper pastoral migration (Davies et al., 2018), certainly aggravated by the building up of civil insecurity, rebellion and war situations in many parts of the continent, especially in the Sahel. Development actors still promote ‘alternative livelihoods’, which often resolve in explosive urban development, as pastoralism is seen as increasingly vulnerable (Catley, 2017). Climate change narratives, reinforcing old views of desertification, remain short-sighted, ignoring the long-term expansion/contraction of drylands (Ellis, 1995; Scoones, 2018), and reiterate control-oriented measures (destocking, green-belts, forest planting) and engineering solutions (irrigation) rather than working with the structural variability of drylands (Behnke & Mortimore, 2016).

Indeed, as per the examples provided above, recent policies have continued to be geared towards agricultural development, urbanization and infrastructure development, and promotion of alternative livelihoods, so that ‘over the long run structural transformation of the economy may generate opportunities for *new livelihood activities that are less vulnerable* to the impacts of droughts and other shocks’ (Cervigni & Morris, 2016, p. 4, emphasis added). The same goal of transforming herders into something else has been reiterated since colonial days, time and again. No longer (necessarily) because pastoralists are ‘irrational’ or ‘disruptive’, rather because they are ‘vulnerable’ to their own environment. This is indeed the powerful narrative of resilience. Pastoralists need to be ‘transformed for their own good’, or at the very least, kept somehow confined to those ‘leftover’ areas perceived as having ‘marginal value’ for other, ‘more productive’ forms of land use (Krätli, 2013). On the other hand, ‘high-potential’ areas – along rivers, for example, that serve as important dry-season grazing reserves for pastoralists – are targeted as ideal for commercial agriculture, other forms of development, or by extractive industries like the Uranium mining in Niger (Behnke & Kerven, 2013; Jenet et al., 2016; Krätli, 2015; Mosley & Watson, 2016; Oakland Institute, 2019).

Thus, while there is a greater consensus about pastoralists’ resourceful skills, climate change concerns are instead emphasizing an old proposition, one that goes like this: despite the structural variability of drylands and adaptability of pastoralism, have we reached a limit, or a threshold, to pastoralists’ adaptive capacities? Although climate change is not a new phenomenon, the rate, the scale, and the magnitude of events we are observing is claimed to compromise the sustainability of pastoral livelihoods in drylands: in other words, are they still able to manage variability, when variability reaches such extremes?

We argue that this, more or less implicit, view on the state of pastoralism has two main implications:

1. It is moving the debate backwards to 40 years ago when variability was essentially treated as a problem to solve, and
2. It is disclosing a contradiction of scale: if, on the one hand, it is delusional to address a global problem such as climate change only locally (and indeed, as we have argued,

resilience to climate change is conditional to radical changes in current resource management and production systems at a global scale), on the other hand, the re-emerging fear of variability in the drylands is neglecting the role of local actors and local knowledge. Only when desertification was considered a local problem (during the Sahelian droughts in the late 1970s and early 1980s for example) were local responses recognized as valuable and instructive, as emerged from the shift in the rangeland paradigm in the 1980s. But now that the problem we are facing is global (climate change) there is an increasing assumption that ‘traditional’ livelihood systems – such as pastoralism – that were once deemed viable under ‘normal’ parameters of variability are now no longer tenable.

In addition, such claims of pastoral vulnerability to climate change undermine the fact, as Scoones (2004) has pointed out, that in the context of increasing environmental uncertainty (more droughts, more floods, more storms, more heatwaves, etc.) people are re-thinking their livelihood strategies, changing livestock species (from cattle, to goats, to camels)<sup>8</sup>, changing crop choices (from maize to sorghum)<sup>9</sup>, changing overall strategies (strengthening complementarities and relationships with other livelihood groups)<sup>10</sup>, while herd mobility is becoming even more important.<sup>11</sup> A cross-section of informants interviewed during one of the two research projects informing this paper stressed that pastoralists have always adapted to change and will continue to innovate. According to one:

A lot of pastoralist communities are trying to develop, trying to modernise, trying to engage more in markets, make use of technologies (...) do some things differently, while still being pastoralists. And in some cases, still maintaining some aspect of the extensive nature of livestock keeping.<sup>12</sup>

Others maintained that pastoralists in some areas who had previously ‘exited’ pastoralism were now returning, as the market for livestock products continues to grow. In other words, pastoralists are adapting their adaptive capacities! Remaining flexible to accommodate further change.

Yet, policy prescriptions, by asking whether there is a limit to the adaptive capacities of pastoralists, are failing to keep up with such dynamic adaptation, re-proposing the same solutions and re-casting pastoralism as a dead end. In such a political misconception and how it translates in policy interventions, we believe, there lies the greatest source of vulnerability for pastoral livelihoods. Restrictions to move and trade across different territories and borders, and to access key resources (water, seasonal grazing areas), are limiting the capacity of pastoral livelihoods to operate effectively, in turn determining their vulnerability. Therefore, while the answer to the implicit question about pastoral livelihoods having reached their limit to adapt to circumstances may sadly even be affirmative, the reason is largely political and not environmental. The promise of pastoral resilience may have failed but this may be more linked to the continued misconceptions about pastoral livelihoods and external interventions that undermine them, than to an actual vulnerability to climate change (see also Manzano, 2017). This is different from saying that climate change is not a problem or something to be

ignored. On the contrary, this serves to recognize our responsibilities to endangering a livelihood system that could otherwise be not only well placed to face unfolding circumstances, but also be instructive for global society in face of rising uncertainties (Scoones & Nori, 2021).

### The Kenyan policy framework and its ambiguities

The Kenyan case is particularly illustrative of these ambiguities and paradoxes.<sup>13</sup> As a case study for our article, in the Kenyan policy scape resilience is largely tied within the concerns of climate change, and especially droughts, unsurprisingly, in light of the kinds of climate uncertainties currently facing Kenya and the HoA, as described above. On the one hand, Kenya can be viewed as promoting one of the most progressive policy environments for drylands and pastoral livelihood, as manifested in an articulated policy framework:

1. The new Constitution 2010, which includes articles ‘to protect the interests and rights of minorities and marginalized groups’ – including ‘pastoral persons and communities, whether they are (i) nomadic; or (ii) a settled community’;
2. *Vision 2030*, which represents the overarching Kenyan national plan<sup>14</sup>;
3. The Sessional Paper n.8 (2012) (National Policy for the Sustainable Development of Northern Kenya), commonly referred to as ‘ASALs’ Policy’, which aims at closing the developmental gap between the north and the rest of the country;
4. The Ending Drought Emergency strategy (EDE) 2012–2022, which focuses on building resilience to a wider set of shocks and stresses, not just climate risk. Pastoral mobility is seen as a key drought-management strategy<sup>15</sup>;
5. The *Community Land Act* (CLA) (2016), which aims at securing pastoral community land, which Alden Wily (2018) calls the most progressive land legislation in Africa, provides for communities, including pastoralists, to utilize and manage their land in accordance with customary norms;
6. Various county level Livestock Strategies (see for example, the *Isiolo County Livestock Strategy and Action Plan*, 2016, which send a strong ‘pro-pastoralist’ message).<sup>16</sup> These are important documents that recognize the development gap which separates northern Kenya’s largely arid lands from the rest of the country, the mostly agriculture-suitable highlands and coastal regions. This gap is framed as a consequence of a political history of marginalization and limited investments.

The new policy framework in Kenya identifies most problems of the arid north as political rather than ecological. These documents also recognize the latent domestic trade, resource and tourism potential of ASALs, as well as their strategic position within the Horn. Several of these documents also mention the opportunity to learn from the populations of arid lands how to manage climate change and variability. For example, the 2012 ASAL Policy is an attempt to harmonize with the African Union (AU) Policy Framework for Pastoralism in *Africa* (AU, 2010), notable for its rights-based approach

to pastoral development (Odhiambo, 2013). Unlike the largely technocratic, and mostly depoliticized, focus of most Kenyan national climate policies, this policy is upfront in its endorsement of pastoralism, its critique of the historical neglect of ASAL and – notably – its emphasis on the problems of restrictions to mobility:

Until recently, most governments viewed pastoral areas as net consumers of national wealth that offered poor prospects of return on investment. Pastoralism was therefore less valued than other forms of land use and less well-supported ... Governments now recognise the strengths of pastoralism and have formed ministries or other authorities to enhance the contribution of pastoralism to food security, environmental stewardship, and economic growth (GoK, 2012, p. 5).

The document continues: *Pastoralists have successfully managed climate variability for centuries. Their skills and indigenous knowledge will become more valuable as the impact of global climate change becomes more pressing* (GoK, 2012, p. 12). For the first time in a policy document, not only is the recurrent nature of drought recognized, but also local capacities are valued. Notwithstanding this progress at policy level, problems remain when policies are translated into practice at a twofold level: implementation and mindsets.

### Implementation level and ‘business as usual’

In Kenya, and it is now a few years since these discussions gained momentum, there is still limited investment in pastoral economies. Applied in a normative sense, many are beginning to warn that resilience is about protecting the status quo or enhancing stability rather than being a dynamic response (Brown, 2011). The actions and projects proposed are similar to those designed and implemented before the resilience agenda was adopted (e.g. the kinds of externally directed training, cash transfers, provision of services and infrastructure, water development, etc, described earlier). By tweaking language, past interventions are brought under the all-embracing ‘resilience umbrella’.

The *EDE Strategy*, a 10-year programme (2012–2022) aiming to end drought emergencies by 2022 and focussing on the 23 most drought-prone counties, is a good example of this observation, as it allows development/humanitarian interventions to continue their legacies on the ground (Carabine et al., 2015). Designed to add value to already existing activities, it was noted that 87% of its funds are spent in standard sustainable livelihood projects and disaster risk-management activities, traditional policies linked to disaster reduction, but now rebranded as ‘building drought resilience’. Similarly, interventions proposed by the *Vision 2030* as ‘flagship projects’ are also not particularly different from previous modes of intervention: early warning, irrigation schemes, boreholes, school feeding programmes, market infrastructure, veterinary support, etc. Despite growing recognition of dryland populations’ abilities and knowledge, they are still treated as vulnerable to their environment and somehow in need of development (Semplici, 2020b).

The reiteration of past policies is seemingly also transmitted at county level, where EDE is anchored through the County Integrated Development Plans (CIDPs) emerging from



devolution plans. An assessment carried out by ODI has labelled CIDPs as largely aspirational documents with little evidence of effective programming and tied to budgets available at county level (Carabine et al., 2015). Embarking on the second phase of devolution, in Turkana, for example, despite the identification of the livestock sector as a policy priority, only approximately 2% of the county budget is actually allocated to the pastoral economy, the same figure as was in the previous County mandate (2013–2017). Instead, the largest share of the Turkana budget, in line with EDE's recommendations, is allocated to more classical interventions in dryland linked with water, irrigation, health, and education. From the 2018–2022 CIDP we can trace an ambiguous position towards pastoralism; on the one hand, it describes pastoralism as a specialized livelihood linked to a particular environment:

For the past 400 years, mobile livestock herding offered the most appropriate production system to manage the harsh and variable environmental conditions found in the county (Turkana County, 2018, p. 23).

But, on the other hand, pastoralism is seen as compromised by population growth, climate change, and environmental degradation:

[...] Over the past 40 years, the ability of Turkana people to secure their livelihood from nomadic pastoralism has come under pressure (Turkana County, 2018, p. 23).

And despite livestock appearing as the major source of income (Figure 1) and therefore supposedly a sector worthy of investment, solutions tend not to be found in strengthening the livestock sector but in finding solutions to the lack of alternative options to pastoralism:

[there are] very few viable livelihoods alternatives to nomadic pastoralism, resulting in high levels of poverty and food insecurity among the population (Turkana County, 2018, p. 23).

A lack of alternative options, which the report stresses, has determined the rise of maladaptive strategies:

Unfortunately, in their search for an alternative to pastoralism many poor Turkana households have been forced to engage in livelihoods activities that have a negative impact on the environment. In particular, cutting of trees for fuel wood or for charcoal manufacture has become a mainstay of the economy for many poorer households, who now no longer see these activities as a coping

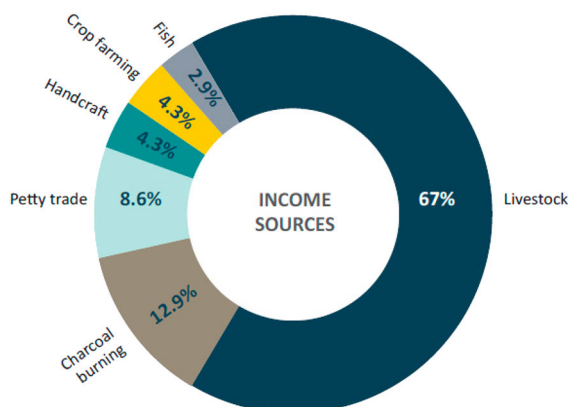


Figure 1. Income sources in Turkana. Turkana CIDP 2018–2022, pag.30.

strategy but as a primary source of livelihoods (Turkana County, 2018, p. 24).

Overall, there has been a lot of emphasis on achieving agreements among nation states (regional transboundary agreements in both East and West Africa, for example) but little effort on their translation into national programmes by budgeting associated investments. There has been a general failure to incorporate these agreements into the wider national frameworks resulting in inconsistencies among neighbouring states that can create disincentives to movement, if for example pastoralists no longer have access to resources or lose their rights if they temporarily vacate an area (Davies et al., 2018). There have also been observed inconsistencies within a single state policy framework when frontiers are closed despite regional agreements for terrorism or disease control (competing national objectives), or in the case of the recent Covid 19 pandemic restrictions (Simula et al., 2021). In general, however, these policies remain developed centrally and have a tendency to be imposed over local population that therefore lacks ownership and control.

### Old mindsets and assumptions

A second set of issues is identified at a mindset level. The proposed interventions are in fact not only reassuringly similar to what has been done so far, and lack the necessary budget commitments, but also reveal a continuation of misconceptions, which emerge (sometimes implicitly) from the nature of the programmes implemented. For example, most resilience programmes in drylands have a food component anchored to narratives of chronic food insecurity (Food Asset programmes for example, run by WFP and USAID). The link between resilience and food security in the dryland context fundamentally reveals that assumptions of pastoral and rangeland low productivity are yet to be overcome in the policy mindsets, especially when solutions are found in alternative production systems, such as in the examples reported above. Another example is the priority given to Early Warning Systems (EWS) to develop knowledge on unfolding circumstances in terms of pasture quality, market prices, rainfall patterns and other indicators. It has been argued that these programmes still work under the premise that instability is a problem to be controlled rather than a constitutive element of the drylands (an aspect of normality), to be embraced (Krätli et al., 2013).

Moreover, conservation plans, irrigation schemes, and land reform/land certification schemes, result in the alienation and fragmentation of pastoral land and reveal a continued misconception of pastoral land use. The Kenyan Climate Smart Agriculture Strategy (CSA) can be seen as another example where powerful actors – in this case, the Kenyan state, the World Bank and UN bodies (such as the FAO), along with private-sector interests (agri-businesses) – are adopting and promoting a global green narrative around what is essentially a long-standing idea, the modernization of agriculture (Buseth & Bergius, 2019). Arguably, just as with agri-modernization endeavours in the past, CSA policies and strategies will sideline the kinds of socio-political processes – such as displacement from critical resources or ‘elite capture’ of newly devolved funding – that continue to marginalize those pastoralists

with the least assets or connections to political power at county level (Campbell, 2021). A cross-section of non-state actors interviewed expressed reservations about what CSA has to offer. One local researcher commented:

First of all, it's agriculture. They don't think about pastoralism. They are thinking about converting Turkana into something else. They are thinking about irrigation. They look at a green dry-season grazing area and see it as having potential for doing agriculture.<sup>17</sup>

Overall, under these premises (implementation problems and budget fallacies, policies' legacies, and perseverant mindsets) there is little room for the new resilience framework to be effective in securing pastoral livelihoods, as it is apparently working more towards holding it back, or transforming it into something else, instead of promoting it. Successful intervention may only occur when customary governance has been legitimized, resource rights secured, the pastoral sector left to prosper rather than transformed, and the overall value of pastoralism understood. How can the idea of resilience be then made more relevant for pastoral areas, and the world more generally?

### Re-learning resilience to climate change

The history of pastoral development is one of misplaced modernization efforts (Nori, 2022). Despite the development sector having moved on from the large-scale technocratic, and externally planned interventions dominating in the 1970s and 1980s (Derbyshire, 2022), and despite the emergence of new policy narratives more friendly to pastoral livelihoods and territories, there remains an underlying sense of battle against uncertainty by means of stability, establishing new forms of predictability and control. In this article, we argue that the time has arrived to reconsider our presence in the world's drylands and offer new ways to support pastoral livelihoods as the future promises more variability than ever before to us all.

Since the latest IPCC report makes an unpredictable future explicit (Ranasin, 2021 IPCC, 2022), the question at stake is this: how do we develop a new relation with uncertainty? Resilience holds the theoretical potential to reorient ourselves towards variability and unpredictability through a critique of modernist planning around centralization, control, forecasting (Chandler et al., 2020). However, implementation has proved largely conservative and reactionary (Grove, 2018). Based on the continuous proliferation of resilience programming, we believe that resilience cannot be simply dismissed. Certainly, however, new thinking about resilience is necessary, it needs to be re-thought and re-operationalized. What are the lessons about variability management that come from pastoral livelihoods? And how can these help us rethink resilience?

Across pastoral societies, variability is recognized as endogenous, a constitutive element of the lived environment, and not external. To endogenize variability is thus fundamental to understand and adapt to future uncertainty (Krätli et al., 2022). What is more, it can be made into a governance principle. We have seen that pastoral systems specialize in exploiting the short-lived concentrations of resources characteristic of unstable environments. Similarly, in line with Emery

Roe's parallels between pastoralist environments and 'control rooms' (2013), and in name of reliability more than stability, governance infrastructure could be restructured to juggle multiple changing factors in an ever-shifting environment to ensure that critical services (as defined by local people) are sustained. Essentially, resilience promotes structurally variable, flexible, real-time and systemic governance.

The processes enabled by a more dynamic governance may result in embedding flexibility in the provision of basic services and infrastructure, or in the land tenure systems as overlapping of multiple rights, or in forms of integration between livelihood groups, among many others (Scoones, *forthcoming*; Senda et al., 2020). These processes can be identified only by institutionalizing a sound understanding of pastoralists' resilience (Krätli et al., 2022) based on dialogue with pastoral communities and building from their experience. This can be done by allowing independent research to function outside project-cycle timelines and by feeding continuous grounded knowledge into development interventions. From this standpoint, resilience will be revealed as less about responsiveness and recovery from short term shocks, and more about longer-term transformations, seen in those everyday practices where knowledge and skills are transmitted, and how these change through time.

As a result, the 'one size fit all' approach will be once for all abandoned. Pastoral systems look very different across the world, and so their resilience needs to be looked at contextually too. There cannot be generalizations. This is because resilience emerges from the relationships, connections, networks, and practices which are rooted in cultures, identities, and politics. Thus, the politics of resilience is of vital concern, and needs to be at the forefront of any agenda for rethinking resilience (Scoones, *forthcoming*).

Lastly, and most crucially, we have learnt that what largely inhibits pastoral livelihoods are non-climate stressors. That is, the overlapping and diversified agendas of the wider socio-political and economic environment, including the pervasive hands of colonialism in the new face of neoliberal and capitalistic penetration of the drylands. These stressors work as a constraint for the effective process-variance practices put in place by pastoral communities to tackle the variability of their surroundings. Foremost is mobility, but not only. An enabling institutional environment should be established and coordinated to remove obstacles to pastoral production and access to resources, through a set of interventions that share the goal to embrace uncertainty without reducing it to a mere risk to be controlled.

### Notes

1. An illustrative listing of recent and current donor-led programmes in Kenya that focus on the 'resilience building' of pastoralist and dryland communities can be found in the Appendix.
2. The size of different populations (plants, humans, and animals) that can be sustained through time in a particular area or ecological niche.
3. Cf.: Westoby et al. (1989) state and transition models; Roe et al. (1998) high-reliability models; Ellis and Swift (1988) persistency models; NRC (1994) rangeland health; Oba et al. (2000) climate-plant-herbivory interaction model, among others.

4. Largely because of the failure of previous interventions in drylands, continued land degradation and drought cycles, and subsequent withdrawal of donors.
5. Cf.: The Global Alliance for Action for Drought Resilience and Growth; the Drought Disaster Resilience Sustainability Initiative (IDDRSI); the Global Alliance for Resilience Initiative (AGIR); Resilient Pastoralism: towards Sustainable Futures in Rangelands; the 'Regional Enhanced Livelihoods in Pastoral Areas'; the 'Building Resilience in Africa Drylands' initiative; and the Lowlands Livelihoods Resilience Project (Ethiopia), among others. See also Appendix for more examples, e.g. Kenya RAPID, REGAL, StARCK, SHARE – Kenya, etc.
6. The idea of commercialisation of livestock production as a pathway to modernisation is not new. In the 1960s and 1970s in Kenya, World Bank-financed 'livestock development' programmes led to the dismantling of traditional rangeland governance systems and institutions, benefiting only a small number of wealthier livestock owners (Zael and Dietz, 2000).
7. <https://nib.or.ke/projects/flagship-projects/galana>
8. C.f.: Watson et al. (2016).
9. E.g.: Scoones (2004).
10. E.g.: Derbyshire et al. (2021).
11. E.g.: Chatty (2006).
12. Interview with international researcher, 14/06/2018, Nairobi (see Campbell, 2021).
13. While the trends highlighted in the previous section also apply to other parts of Africa, such as Central and West Africa and the Sahel, we now focus more directly on the Kenyan case to show how a contradictory policy environment and lingering mindsets are continuing to downplaying pastoral livelihoods contributing to make them more vulnerable.
14. To be noted that while pastoralism is recognised in Vision 2030 for its importance to the economy, it is also understood that 'transformation' of pastoral areas is both desirable and inevitable (GoK 2007 p. 42).
15. While the 'EDE: Second MTP acknowledges that 'pastoralism remains the dominant production system in the ASAL and underpins its regional economy' (GoK-NDMA, 2014, p. 23), it also reproduces the notion that some level of 'pastoral transformation' (GoK-NDMA, 2014, p. 22) is inevitable.
16. According to this strategy, pastoralism, 'if properly supported', remains 'the most appropriate land use and livelihood in the ASAL' (GoK-ICG, 2016, p. 15).
17. Interview with Kenyan local researcher, 05/03/2018.

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## Authors' contribution

Greta Semplici is the lead author for this article, she wrote the first drafts to which Tom Campbell contributed with some case material from Kenya. All authors contributed analytical insights in revising the paper. The authors' contribution can be qualified as 60% GS and 40% TC.

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## Data availability statement

This paper is a meta-analysis and does not include primary data.

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**Appendix: Indicative list of current or recent donor-funded pastoralist – resilience programmes and projects in Kenya. This list is by no means exhaustive but does include some of the prominent donor-funded pastoralist-area-resilience programmes of recent years.**

Principle donor(s)	Programme	Duration	Funding	Institutional partners	Areas of focus
WB	<i>North and Northeastern Development Initiative (NEDI)</i> <sup>a</sup>	2018–	\$1 billion in grants and loans	GoK, Northern Kenya County administrations	Includes investment in: infrastructure, renewable energy, ‘climate-smart agriculture’, water and sanitation, Household Safety Net Programme (HSNP), National Agricultural and Rural Inclusive Growth <sup>b</sup> initiative
USAID	<i>Resilience and Economic Growth in Arid Lands (REGAL)</i> <sup>c</sup>	2015–2017	\$45.5 million	GoK-MALF in five ASAL counties; NDMA; Kenya Agricultural Research Institute (KARI); local NGOs	Livestock productivity and marketing, including reduction in livestock emissions, drought resilience
USAID / Swiss Development Cooperation (SDC)	<i>Resilient Arid Lands Partnership for Integrated Development (Kenya RAPID)</i>	2015–2020	\$35.5 million	GoK-MALF in five ASAL counties, local and international NGOs (Care, WV, CRS), private sector organizations	Water supply and NR governance across five northern ASAL counties, Supports Kenya’s EDE Common programme framework <sup>d</sup>
UKAID/DFID	<i>‘Strengthening Adaptation and Resilience to Climate Change in Kenya Plus (StARCK+)</i> <sup>e</sup>	2013–2019	£30 million	UNDP, IIED, AfGRA, IBRD, local partners	Technical support and funding to CSA initiatives, and to the <i>County Climate Funds (CCF)</i>
UKAID/DFID	<i>Arid Lands Support Programme</i>	2012–2017	£14 million		‘improve the coping strategies for over 500,000 of the poorest people in Northern Kenya to help them to adapt to climate change and improve their livelihoods <sup>f</sup>
EU	<i>Supporting Horn of Africa Resilience in Kenya (SHARE-Kenya)</i>	2013–	€40 million	GoK, FAO, DANIDA	Drought resilience, food and nutrition security, and DRR in ASAL counties <sup>g</sup>
SIDA	<i>Improved food security and resilience for vulnerable communities in Kenya</i>	2016–		FAO	Food security, Natural Resource Management, livelihoods, climate change adaptation.

<sup>a</sup><https://www.worldbank.org/en/news/feature/2018/05/08/boosting-prosperity-improving-equity-in-north-and-north-eastern-kenya>

<sup>b</sup><http://projects.worldbank.org/P153349?lang=en>

<sup>c</sup>[https://www.usaid.gov/sites/default/files/documents/1860/REGAL\\_IR.pdf](https://www.usaid.gov/sites/default/files/documents/1860/REGAL_IR.pdf)

<sup>d</sup><https://www.usaid.gov/documents/1860/kenya-resilient-arid-lands-partnership-integrated-development>

<sup>e</sup><https://devtracker.dfid.gov.uk/projects/GB-1-203574>

<sup>f</sup><https://devtracker.dfid.gov.uk/projects/GB-1-202619>

<sup>g</sup>[https://ec.europa.eu/europeaid/kenya-supporting-horn-africa-resilience-kenya-share%E2%80%93kenya\\_en](https://ec.europa.eu/europeaid/kenya-supporting-horn-africa-resilience-kenya-share%E2%80%93kenya_en)