Chapter 5
Land Tenure, Livelihoods, and Conservation: Perspectives on Priorities in Tanzania's Tarangire Ecosystem

Peadar Brehony, Alais Morindat, and Makko Sinandei

> *Etejo enkiteng': "mikintaaya, nchooyioki!" – The cow said "do not lend me out, give me away!" sensu The owner treats their own property better*
>
> Kipury (1983:183)

Abstract Research on conservation efforts demonstrates that local community support is critical to achieving conservation goals. In this chapter, we highlight innovative approaches which are currently being taken in the Tarangire Ecosystem to combine access to secure land tenure rights with landscape scale access to functional heterogeneity, governed through both formal and informal institutions. Informed by the concepts of social-ecological systems and just conservation, this chapter begins by considering the recent history of natural resource governance institutions in the Tarangire Ecosystem, where traditional systems were matched to the social-ecological context of that time. We go on to discuss how modernisation has resulted in significant changes to these systems over time, with a focus on the ways in which changes in land tenure have resulted in a loss of flexibility and shifts in local livelihoods. We highlight how, in this context, land tenure rights can play a critical role in community-based conservation efforts in the Tarangire Ecosystem to benefit both people and wild animals. We follow this with a description of the ongoing process in the Tarangire Ecosystem to secure rights to land and resources through spatial planning at a local scale, and how this can be expanded to the landscape scale. Finally, we reflect on some of the challenges with such an approach,

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particularly given the significant social-ecological variability and uncertainty that lies ahead.

Keywords Tanzania · Land tenure · Livelihoods · Community-based conservation · Pastoralism · Social-ecological systems

5.1 Introduction

The notions which underpin Western ideas of conservation have grown from natural resource management in the eighteenth century, to the regulation of hunting and spatial based protected areas in the nineteenth century, to the protection of ecosystem processes and conservation of all biodiversity in the twentieth century (Hölzl 2010; Watson et al. 2014; Western et al. 2020).

In East Africa, over the twentieth century, conservation interventions focussed on protecting large mammals and landscapes (Bennett et al. 2009; Fynn and Bonyongo 2011; Jenkins et al. 2013; Western and Gichohi 1993), sometimes at the expense of resident and migratory people (Adams 2004; Brockington 2002; Lindsay 1987). Over recent decades, conservation interventions have often sought to include local communities, recognising the important role they play in protecting and managing ecosystems (Western et al. 1994). Vast areas of the world have long been managed and shaped by local people, under various property regimes (Ellis et al. 2021). Currently, many local indigenous communities manage and practice sustainable rural livelihoods, while also conserving nature under a diverse set of stewardship practices successfully (Díaz et al. 2019a) on at least 25–28% of the Earth's land surface (Garnett et al. 2018).

In the Tarangire Ecosystem, national parks were originally set aside to protect people from wild animals (Chap. 2) and to allow certain people to hunt wild animals (see Fig. 5.1). These parks were set aside in areas that were deemed (by outsiders) to be marginal for development, a pattern recorded elsewhere (Joppa and Pfaff 2009). However, based on our best current understanding, many conservationists recognise that the areas which have been set aside are too small to avoid losing biodiversity, due to habitat fragmentation, insularisation, and future uncertainty (Fynn and Bonyongo 2011; Newmark 2008). For instance, in the Tarangire Ecosystem, Tarangire National Park does not cover the entire annual ranges of wide-ranging large mammals such as elephants, zebras, and wildebeests (Chap. 12). To overcome these shortcomings, conservationists and governments have sought to engage with landowners (we shall call them community members or communities) outside of protected areas, like national parks, often on terms set by conservationists. These arrangements tend to overlook the fact that those who contribute the greatest in this arrangement, and yet have the most to lose in terms of access to resources, are the community members. As others in this volume (Chap. 2) and elsewhere (Bluwstein et al. 2018; Brockington 2002; Igoe 2004) have demonstrated from research in Tanzania, ultimately, a history of land alienation together with

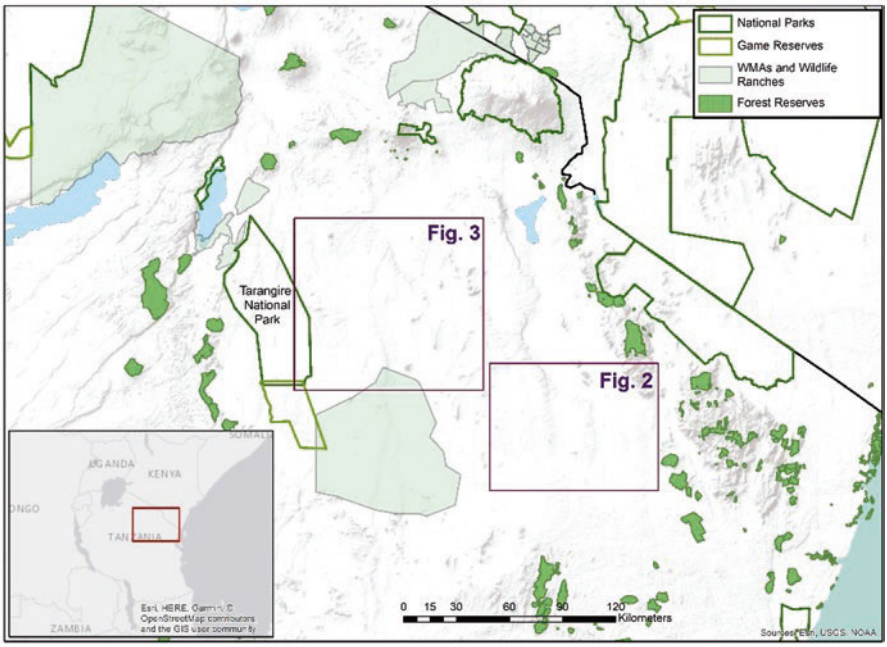

Fig. 5.1 Overview map of the Tarangire Ecosystem in northern Tanzania with the areas covered by Figs. 5.2 and 5.3 shown. Conservation area extents are from world database on protected areas (UNEP-WCMC and IUCN 2020) (Some boundaries are disputed, and some areas are missing from this database, including Randilen WMA)

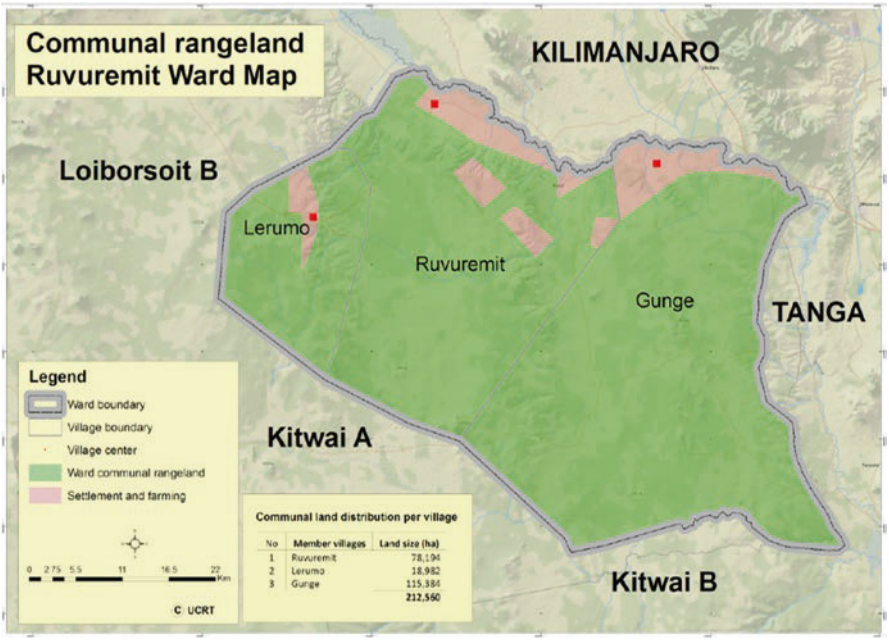

Fig. 5.2 Examples of village land use plans and joint rangeland plans from the eastern part of the Tarangire Ecosystem – see Fig. 5.1. (Map from UCRT and Simanjiro District Council 2019)

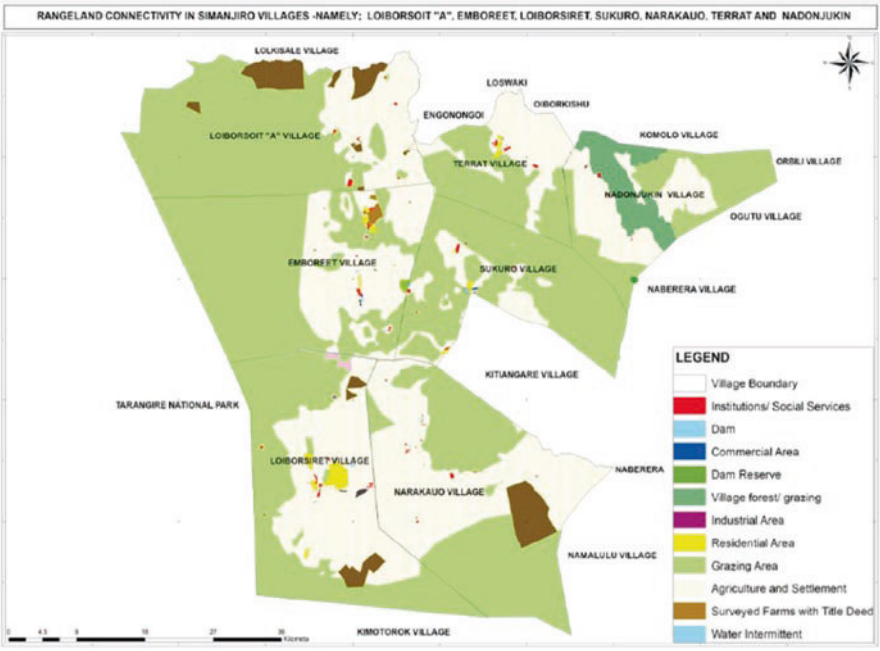

Fig. 5.3 Village land use plans and joint rangeland plans secure larger open rangelands in the eastern part of the Tarangire Ecosystem – see Fig. 5.1. (Map from UCRT and Simanjiro District Council 2019)

projects which fail to meet expectations, have resulted in local distrust towards conservation. Yet, at the same time, there is also an abundance of research which demonstrates that local community trust and support is critical to achieving conservation goals (Chaps. 4 and 6; Hulme and Murphree 1999; Persha et al. 2011; Adams and Hulme 2001; Oldekop et al. 2016).

Research from across the globe shows that: secure rights to resources; clear rules about the control of land and natural resources; transparent enforcement and revision of these rules and rights (Agrawal et al. 2008; Brehony 2020; Persha et al. 2011) together with robust governance institutions (Brehony 2020; Brockington et al. 2018; Kremen and Merenlender 2018; Ostrom 2009), and processes of engagement which are based on trust and respect (Davis and Goldman 2019; Kremen and Merenlender 2018), are all critical to successful natural resource management and conservation. At a more local scale, the approaches taken to achieve successful natural resource management and conservation will necessarily vary, as they are tied to locally relevant cultural and economic realities. Yet, there remains a dearth of research on the place-based ways in which secure rights to land, and support to local livelihoods can work in specific social-ecological contexts. In this chapter, we will highlight the innovative approaches which are currently being taken in the Tarangire Ecosystem to secure land rights and in turn support the resilience of culturally relevant local livelihoods (Davis and Goldman 2019). The approaches we describe are

suited to the social-ecological context of the Tarangire Ecosystem, as well as the particular constitutional and legislative setting of the United Republic of Tanzania. They also recognise the important role that local communities continue to play in maintaining the ecological health of the land (see Berkes et al. 2012) on terms that community members dictate.

This chapter begins by considering the recent history of natural resource governance institutions in the Tarangire Ecosystem and how these have changed over time. We describe in detail how pre-existing traditional natural resource management systems were tailored to the social-ecological context of that time. We look at the current social and ecological context of the Tarangire Ecosystem, with a focus on how land tenure ties to local livelihoods. We then highlight the importance of rights to land tenure in this context, and show how such rights can play a critical role in the conservation of the Tarangire Ecosystem for people and wild animals. We follow this with a description of the ongoing process to secure rights to land through spatial planning at a local scale, particularly where there are natural resources that are communally significant. We also discuss how this process can be scaled up across a landscape. Finally, we reflect on the challenges of spatial planning in the context of current and future social-ecological variability and uncertainty. Although we deliberately limit our focus geographically to the Tarangire Ecosystem, we expect that our findings are likely to be relevant to other social-ecological systems which face similar challenges, particularly those in other sub-Saharan rangelands.

5.2 Research Approach

Our research approach is based on the concept of social-ecological systems which, as described by Berkes and Folke (1998:4), is a concept which can be used as an analytical structure to study local natural resource management systems by "match[ing] the dynamics of institutions with the dynamics of ecosystems for mutual social-ecological resilience and improved performance". Taken in this sense, linking social and ecological systems allows us to link two different streams of resource management theory. Firstly, there are systems thinking and adaptive management, where there is an emphasis on linkages and feedback controls across social and ecological systems. Secondly, there are people-oriented institutions and property rights. Using this as our conceptual framework allows us to order material, unveil patterns, and think clearly about relevant phenomena, all in a manner which emphasises the importance of, and links between, coupled and interdependent social and ecological dimensions (Folke et al. 2005). Furthermore, we look beyond the notion of simple panaceas, and instead remain open to a multitude of opportunities towards the amelioration of undesirable social and ecological outcomes (Ostrom and Cox 2010).

Such an approach has previously been used in other research on natural resource management to highlight the most significant elements that affect the likelihood of users' self-organizing to sustainably manage resources. These include: (a)

communities have clear devolved rights over resource management; (b) institutions function at the correct social and ecological scales; (c) governance mechanisms can link across scales; (d) communities experience benefits from managing their resources; (e) strong social norms of collaborative governance and management are present (Brehony 2020; Cumming 2011; Ostrom 2007, 2009; Reid et al. 2014).

Our research approach is also informed by Martin's (2017) notion of "just conservation," where local perceptions of social justice mediate conservation outcomes. Indeed, local perceptions of social justice can determine how legitimate an intervention (like a conservation project) is considered to be and therefore the extent to which there will be local support for the intervention (Pascual et al. 2014, 2021). If this is not considered and the legitimacy of an intervention is questioned, then there will be a much higher compliance cost, an increased likelihood of conflict, and a decreased chance of achieving intended outcomes (ibid.). On the other hand, inclusive approaches involve appropriate access to resources, equitable distribution of costs and benefits, participatory decision making and respect for local cultures and knowledges.

Finally, due to the significant restrictions to travel caused by COVID-19, this chapter was principally a desk-based review of recent literature, together with our own knowledge and experiences. Alais Morindat has gone from herding his father's livestock, to now owning his own herd of livestock in the Tarangire Ecosystem. Makko Sinandei has spent decades working in the Tarangire Ecosystem for Ujamaa Community Resource Team. Peadar Brehony has been a regular visitor to the Tarangire Ecosystem for over 20 years. Aside from this, the research we present is also informed by conversations with, and readings of the works of many others.

5.3 Land and Livelihoods in the Tarangire Ecosystem

5.3.1 Livelihoods and Land Management in Semi-arid Rangelands

The Tarangire Ecosystem lies in East Africa's semi-arid rangelands, where pastoralism[1] combined with subsistence hunting and fishing, or small scale cultivation, has been a way of life for at least the past 4000 years (Marshall 1990; Marshall et al. 2018; Spear and Waller 1993a). Indeed, associations between people and their domestic grazing animals, as well as between people and wild animals, have allowed people to thrive in the arid and semi-arid rangelands of East Africa, where inter-annual rainfall regularly varies by more than 30% and ecological shocks are common (Collett 1987; Homewood 2008; Spear and Waller 1993a). East Africa's

[1] Pastoralism encompasses both those who are directly dependent on livestock for their livelihoods, as well as, in a broader sense, the entire system that is built around this people-livestock culture and economy (Homewood 2008).

unique bimodal rainfall patterns, and the introduction of *Bos indicus* cattle breeds, provided optimal conditions for the emergence, between 3000 and 2000 years ago, of specialised, milk-based pastoralism (ibid.).

These livelihood systems were built on detailed and locally rooted environmental knowledge which were passed on from generation to generation. The focus of these systems was on minimizing risk, particularly from drought losses, for long term resilience (Butt et al. 2009; Mwangi and Ostrom 2009). These flexible systems were not some imagined harmony with nature, but rather an effective strategy to adapt to the local social-ecological circumstances.

The people living in East Africa's rangelands have therefore, for millennia, maintained and created ecosystems and landscapes *for* pastoralism; ones which maximize seasonal grazing resources that can also be taken advantage of by wild animals (Allan et al. 2017; Illius and O'Connor 2000; Keesing et al. 2018; Russell et al. 2018; Tyrrell et al. 2017; Western 1982). For instance, historically, large scale burning was an important part of landscape management to both prevent bush and woodland encroachment, but also to control parasites (directly, such as ticks, and indirectly, such as tsetse flies that thrive in bush land; Kjekshus 1977). Likewise, limiting crop cultivation to areas with predictable rainfall or the potential for irrigation, also ensured that vast rangelands were maintained principally for livestock and wild animal grazing and browsing.

5.3.2 Maasai Social-Ecological Systems

Over recent centuries, much of the Tarangire Ecosystem has been managed by the Maasai people.[2] We will now examine the ways in which they manage their social-ecological systems. The Maasai people are transhumant pastoralists (and agro-pastoralists) who speak a Nilotic language (Maa), and live in southern Kenyan and northern Tanzanian rangelands. Maasai rely on their livestock for cultural, spiritual, and economic reasons. For instance, livestock are used as food, to sell, or in culturally and spiritually important rituals. As such, the management of grazing commons to ensure herd productivity and resilience is deeply rooted in Maasai governance and herding practices (Spear and Waller 1993b). Although pastoralism is of paramount importance to Maasai, they also have a complex relationship with cultivation-based people and hunter-gatherers where each group traded with each other, relied on each other, fought against one another, or assimilated people from different groups during times of hardship (Berntsen 1976; Sutton 1993; Waller 1993).

The Maasai people constitute thirteen politically semi-autonomous and geographically distinct sections, with all sections tied together under the same moieties (*inkajijik*), clans (*ilajijik* and *ilgilat*) and age-set groupings (*olaji* and *ilporori*), as

[2] Other communities, including Barbaig, Warusha, Mbugwe, Rangi and many others, also managed, or still manage, parts of this landscape. In this chapter we deliberately focus on the Maasai whose influence is the most geographically extensive over this area.

well as language and culture. Maasai sections are social and political units that regulate access to large territories and thereby limit the use of grazing areas and water resources to people within broad geographical areas (Homewood and Rodgers 1991). Although diminished today, overlapping clans and age-sets allowed Maasai to use reciprocal clan and age-set arrangements to move with livestock over large areas, including into the lands of other Maasai sections, largely in synchrony with wild animal migrations (Brehony 2020; Western and Nightingale 2004). These movements, often in times of severe droughts, expand the scale of use from an annual range of a few thousand, to tens of thousands of square kilometres (Western and Finch 1986).

In landscapes such as the Tarangire Ecosystem, this scale of movement is no longer possible because of changes in land tenure, including the introduction of Tarangire National Park where access to resources by local communities is no longer permitted (Igoe 2004; but see Miller et al. 2014 for other research on the historical importance of the park for grazing).

At the household level (*ormarei*) a family's social standing, wellbeing, and survival are intimately bound to the welfare of its livestock through the conservation of pasture and water. Nevertheless, there is no word for "conservation" in Maa. Instead, the link between rainfall, pasture production, herd productivity, family welfare and the maintenance of commons resources is incorporated in the concept of "*erematare"* (Western et al. 2020). *Erematare* is best described as an "ethos", the interconnectedness of Maasai husbandry practices, cultural customs and systems of household, livestock and land management (Godfrey 2018). *Erematare* linkages stretch across landscapes through social networks (as described above), giving households access to the resources needed to sustain them through the seasons and in times of drought.

Erematare also extends to the management of land for all life, including wild animals, which holds many values and uses among the Maasai, including for food, clothing, medicine, sacred ornamentation, utensils, clan symbols, environmental indicators and aesthetic appeal (Chap. 13; Kioko et al. 2015; Roque De Pinho et al. 2014; Western et al. 2019). Concepts which approximate this ethos include Nicolay Vavilov's "biocultures[3]" (Nabhan 2012) and Aldo Leopold's "land ethic" (Leopold 1949).

These systems of land management are rooted in local traditional ecological knowledge, and the ways in which this was passed on was a critical part of Maasai political and social organisation. For instance, young boys were sent out by their fathers and elders, to herd livestock in the pastures near home, learning about their livestock, what they needed, what plants they ate, how often they were to be watered, and so on. Then, as they became young men, they became warriors (*ilmoran*) who were given responsibility for herding cattle over longer distances, learning about the landscape at a broader scale, the locations of different patches of resources,

[3] Nicolay Vavilov describes biocultures as evolved husbandry practices and cultures sustained the health of the land for generations in the face of environmental perturbations and climate change.

including vegetation, water, and salt licks, interacting with neighbouring people, and understanding how livestock moved over both wet and dry seasons. This was "*eleenore,*" in the sense described by Ole Mpaayei in 1954: "when Maasai wish to migrate, they send scouts [*ilaleenok* who go to *eleenore*] to first see the land. When they return … they tell you how much grass and water there is" (Ole Mpaayei 1954:60).

Following this, warriors become junior elders who decide, in collaboration with their traditional age-set spokesmen (*ilaigwanak loonkishu*), fathers, elders, and warriors, where livestock should move, and how grazing resources should be managed (Brehony 2020). The role of elders is particularly important in drought seasons when knowledge about, and ability to negotiate access to distant resources is critical.

5.3.3 Changes in Land Institutions Over Time

What we describe above represents a picture of the traditional organisation of Maasai (Brehony 2020; Jacobs 1965). However, over recent decades, Maasai livelihoods, as well as their systems of land and livestock management have changed. Traditional systems have not suddenly been rejected, but instead, in many parts of Maasailand, the traditional and the modern have formed a dynamic combination with trade-offs and battles for legitimacy and morality (Brehony 2020).

For people living in the Tarangire Ecosystem, the process of modernisation has come at a significant cost. Over the past few decades, slowly and surely, millions of acres of land have been alienated from the management of traditional institutions, to other land uses, from large-scale commercial farms, which were primarily allocated to expatriate farmers, to national parks, and other land uses (Bluwstein et al. 2018; Kauzeni et al. 1993). Following independence in 1961, Tanganyika nationalised all land in 1962, and in 1963 the role of traditional chiefs in administering local affairs was abandoned (Kauzeni et al. 1993), and instead government committees at the regional, district, and village level were formed (ibid.). This fundamentally altered the rural land management that had once relied on traditional leadership, and commons land in particular.

Around the same time, the Tarangire Ecosystem landscape was being fragmented with new institutions which control land-use and management. We will not cover the history of Tarangire National Park here, as this has been covered by others in this volume (Chap. 2).[4] For the purposes of this chapter, we will revisit a couple of key points. An area around the Tarangire River which was being used and managed by pastoralists and other groups was initially declared a game reserve for hunting wild animals, called Tarangire, in 1957 (Igoe 2004). While a game reserve, the area continued to be used for grazing by local pastoralists, including during a severe drought

[4] These histories are similar to those we have expressed in other published work (Brehony 2020) for other parts of what was considered Maasailand, which includes the Tarangire Ecosystem, up to central Kenya at its northern extent.

in 1961 when elders revealed that access to Silale (or also Silalo) swamp was a critical drought grazing refuge used by some families who lived in the surrounding areas[5] (ibid.).

Then, in 1970 the area was gazetted as a National Park (Igoe 2004), controlled and managed by a government institution, and local people were no longer permitted to use or manage the land or resources within the boundaries of the park (see Fig. 5.1). Practices which once took place, such as accessing water, grazing, foraging, cultivating, or simply walking through to a neighbouring area, were no longer permitted (Goldman 2003; Igoe 2004; Igoe and Brockington 1999; Sachedina 2008). Roads, bridges, hotels, and offices were now built in areas where there were once none. Or that is how the area which became Tarangire National Park was perceived and understood to local communities who saw this form of conservation as no different to any other process of land alienation. To them, the park was not a public resource, but rather an area from which they were excluded, while wealthier local and international elites benefited (Igoe 2004; Sachedina 2008).

Indeed, over the past decades, a plethora of other pressures, including large-scale commercial agriculture developments (for example for wheat, barley, and flowers) and international development programs have further reduced resource availability and alienated local citizens from large tracts of land (Bluwstein et al. 2018; Igoe 2004; Igoe and Brockington 1999; Kauzeni et al. 1993).

Today, the Tarangire Ecosystem spans three of Tanzania's government administrative regions, and the landscape is mosaiced by two national parks (Lake Manyara National Park and Tarangire National Park), a game reserve, several game controlled areas, several forest reserves, a wildlife ranch, several community-based conservation initiatives, including Wildlife Management Areas (WMAs), Certificates of Customary Rights of Occupancy (CCROs), and easements, as well as numerous small towns and urban centres, and vast areas of village land (see Fig. 5.1).

5.3.4 Hardening of Lines and Loss of Flexibility

A social-ecological systems perspective demands that we understand links, feedbacks, and dynamic relationships which are constantly evolving (Liu et al. 2007; Ostrom 2007). Yet, the process of modernisation we describe above is predominantly about anchoring things in space, which in effect creates spatial separations and hardens boundaries (Watson 2010).[6]

For instance, Tarangire National Park has, together with a multitude of other forms of land alienation and government policies, accelerated the rate of growth of cultivation areas in surrounding lands, for two main reasons. Firstly, cultivation is

[5] Other research suggests that the swamp was indeed used in the past, not on a regular annual basis, but rather during the most severe droughts (Miller et al. 2014).

[6] This process happens for a number of reasons, not least of which is territorial and resource control (Scott 1998).

fixed in space and when people decide to cultivate a particular piece of land, there is no debate over who owns the land. In a context where the alienation of commons land (such as when creating national parks) is commonplace, there is therefore a strong incentive for people with a lack of secure land tenure to turn towards the more readily observable land-use, cultivation (see Weldemichel and Lein 2019 for a similar effect in the Maasai Mara with fencing).

Secondly, restricting access to a variety of key grazing resources (functional heterogeneity) eroded the mobility and flexibility that is crucial for livestock and wild animals to thrive in semi-arid rangelands (Butt et al. 2009; Fynn et al. 2016; Owen-Smith 2004; Western et al. 2020). Although there are inevitable trade-offs when livestock and wild animals compete for food, water, and other critical resources, and share parasites and pathogens (Herrero et al. 2009; Keesing et al. 2018), the integration of livestock and wild animals can also provide social and ecological benefits under particular conditions (Keesing et al. 2018; Kimuyu et al. 2017; Odadi et al. 2011).

Conditions such as flexibility and mobility allow pastoralists in highly variable semi-arid rangelands to track the richest pastures, often in tandem with wild animals. This minimizes exposure to drought, pathogens, local pasture degradation and perturbations (Boone 2005; Fynn et al. 2016; Wang et al. 2006). These ecological benefits of mobility are reflected in the energy bonus of improved digestive efficiency, growth rates and milk yields for both mobile livestock and wild animals (Butt and Turner 2012; Illius and O'Connor 2000; Owen-Smith 2004; Wang et al. 2006). However, these benefits are not realised when livestock and wild animals are increasingly confined to much smaller spheres of more intense grazing as mobility and flexibility are eroded (Butt 2010; Butt et al. 2009). Without the rest periods that were part and parcel of traditional grazing management, more regular intense grazing results in reduced grazing productivity, as multi-decadal rangeland research in other parts of Maasailand has demonstrated (Western and Mose 2021; Western et al. 2021). These factors result in exacerbated losses during drought periods, which in turn drive pastoralists to diversify into other livelihoods, including cultivation (Homewood 2008; Homewood et al. 2009). Indeed, an increasing number of Maasai are diversifying livelihoods into cultivation and wage-labour in urban and peri-urban areas (Homewood et al. 2009; McCabe et al. 2010). To exacerbate matters, cultivation tends to stabilise more readily in higher rainfall areas, which are often also key grazing areas for livestock and wild animals. This vicious cycle became obvious to pastoralists and conservationists alike, but different groups proposed different solutions to mitigating the loss of open rangelands.

Between 2010 and 2019 the percentage of global land covered by protected areas expanded from 14.1% to 15.3% (Maxwell et al. 2020). Some conservationists advocate for these area-based conservation targets to increase. For instance, there have been calls to set aside 20% of the globe for conservation by 2020, and even 50% by 2050 (Maxwell et al. 2020; Watson et al. 2014; Wilson 2016). Yet thus far, the success of such targets remains unclear (Maxwell et al. 2020). More importantly, area-based targets ignore the fact that land is a critical asset for people, particularly in rural areas and in the global south, to prosper, while simultaneously failing to

recognise the important role that local communities play in conservation (Díaz et al. 2019a; Garnett et al. 2018). In Tanzania, the state and its manifold arms of power have regularly relocated people, disrupted rural livelihoods, or claims to land, in the name of conservation,[7] with the backing of global narratives that area-based targets can solve global wild animal declines and extinctions (Weldemichel 2020). Yet, at the same time, Tanzanians, particularly in poorer rural areas, rely on access to land. Over 72% of the population derive their livelihoods from cultivation, livestock, or related activities – all of which depend on land. As of 2020, the agricultural sector continued to be the biggest contributor to national GDP, at 26.5% (Bank of Tanzania 2020).

Other conservationists have proposed various forms of community-based conservation. In the Tarangire Ecosystem these have, for instance, taken the form of easements (see Davis and Goldman 2019; Northern Tanzania Rangelands Initiative 2019), wildlife ranches (see Goldman 2006), village based eco-tourism partnerships (see Dorobo Tours and Safaris and Oliver's Camp Ltd. 1996), and Wildlife Management Areas (see Keane et al. 2019). We will not go into detail about each of these approaches, but there are two common themes. Firstly, these models are reliant on revenue from international eco-tourism. Aside from in a minority of cases, conservation and eco-tourism alone cannot adequately compensate for loss of access to resources, or overcome other opportunity costs (Keane et al. 2019, Tyrrell, in press). Any revenue that is generated is often woefully inadequate and rarely reaches local people, particularly the poorest, who need it most (Keane et al. 2019). The COVID-19 crisis has further demonstrated the lack of resilience in relying on single external sources of funding, such as international eco-tourism (Lindsey et al. 2020).

The second common theme in all community-based conservation efforts in the Tarangire Ecosystem, is that the fate of wild animals depends heavily on the future of pastoralism (see Northern Tanzania Rangelands Initiative 2019). Wild animals find refuge in protected areas, but particularly in the case of large mammal, for significant populations to persist, they must range beyond protected areas to access seasonal pasture and nutrients (Fynn and Bonyongo 2011; Owen-Smith 2004). These areas are community land, often owned and managed by pastoralists. Yet, as we have described above, pastoralism faces many threats from both an ecological and social perspective. Many of these threats are shared with wild animals. For both livestock and wild animals, ecological adaptability to environmental perturbations is being eroded through the loss of space and mobility; land-use changes and land degradation; decreasing rangeland productivity; decreasing resilience to droughts; and the climate crisis (Boone et al. 2005; Haile et al. 2020; Hobbs et al. 2008a; Western et al. 2015, 2021). Socially, the erosion of traditional governance institutions which regulated pasture use and minimized risk to drought and other perturbations, is exacerbating these processes (Mwangi and Ostrom 2009). However,

[7] In early 2021 the Ngorongoro Conservation Area Authority attempted to evict thousands of people in the name of conservation and there have been several violent relocations in the areas surrounding Serengeti National Park (Currier and Mittal 2021).

because these are commonalities, redressing them can alleviate threats to both pastoral systems and wild animals.

For instance, by finding ways to include both informal traditional land-use practices and formal (e.g. state) practices, there are opportunities to support governance processes which are participatory, legitimate and effective (Folke et al. 2005). Indeed, social-ecological systems theory and landscape governance theory suggest that negotiated combinations of the formal and informal can help to solve problems of common resource management through social networks, rule-based institutions, and devolved management rights, at appropriate social and ecological scales (Cumming 2011; Ostrom 2007; Reid et al. 2014).

5.3.5 *Conservation Inside-Out*

There are therefore opportunities to build on this understanding in pastoral landscapes, such as the Tarangire Ecosystem. Western et al. (2020) show how space and mobility for sustaining large mammals can be secured indirectly through an approach the authors term 'conservation from the inside-out'. This approach draws on the aforementioned husbandry (*erematare*) and conservation practices used to maintain the productivity and resilience of pastoralism or other land uses, that also directly or indirectly maintain large free-ranging wild animal movements in the process. Whereas community-based conservation is founded on direct incentive-based approaches tied to wild animal conservation, an "inside-out" approach uses primary livelihood considerations to win space for wild animals indirectly (ibid.). At the heart of this approach are support for local citizens' rights to land and natural resources,[8] with support for thriving and ecologically important livelihoods, and *erematare,* a place-based land ethic to hold it together.

The traditional grazing and land-use practices, social networks, and governance arrangements that such an approach is reliant on to sustain natural resource management from an ecosystem to landscape and regional level, are changing. However, as we shall now describe, new tools and institutions which explicitly consider the current social-ecological realities also exist.

5.3.6 *Wildlife Management Areas, Village Land, and Certificates of Customary Rights of Occupancy*

The current effectiveness and constraints of Wildlife Management Areas (WMAs) have been covered in detail elsewhere (social: Homewood et al. 2020; Keane et al. 2019; Nelson et al. 2021; Sulle et al. 2011; Wright 2017; ecological: Kiffner et al.

[8] These already exist in constitution and legislation, but not always in practice.

2020; Lee and Bond 2018a). However, what we wish to focus on here are the opportunities. WMAs can offer secure rights to land tenure, and livelihoods, through land-use planning. For instance, Wright (2017) details the cases of Enduimet WMA and (the once nascent) Lake Natron WMA where people turned modern and formal WMAs into spaces which fit their traditional ideals by using new land management tools, primarily *for* grazing of livestock, which can potentially also benefit wild animals (Fynn et al. 2016; Keesing et al. 2018; Russell et al. 2018; Tyrrell et al. 2017). Similarly, it appears that Randilen WMA in the Tarangire Ecosystem is now[9] regarded by the participating communities as community-based, and have come to view the WMA as centrally important to their livelihoods (Chap. 6).

Likewise, Gardner (2016) and Nelson and Ole Makko (2005) describe the ways in which people in Loliondo, another part of Maasailand in Tanzania, turned modern state governance in the form of Village Land into legitimate political entities capable of securing livelihood and partnerships with eco-tourism operators on strong terms.

In the rest of this chapter, we will focus our attention on alternative innovative approaches, particularly Village Land Use Planning and Certificates of Customary Rights of Occupancy (CCROs).[10] To do this, we will focus on the work of Ujamaa Community Resource Team (UCRT) who have pioneered this process in the Tarangire Ecosystem (Lekaita et al. 2014).

Over the past two decades UCRT have, in collaboration with local communities, District Councils and other development partners, supported villages in the Tarangire Ecosystem in their efforts to put in place participatory land-use plans and natural resource management plans. These cement traditional land-use and governance practices with legal requirements, under Tanzania's National Land Policy (URT 1995), to plan village land-use. This participatory process, together with a robust legal instrument, provides an effective, legitimate and participatory tool for land management (Folke et al. 2005).

The result is a system where local citizens have clear authority and rights over their land, and where land uses which are critical to local livelihoods are formalised (Lekaita et al. 2014). These land-use plans are then managed by village councils who are the most powerful form of local government authority in Tanzania (URT

[9] In the initial implementation of Randilen WMA, empirical research by Loveless (2014) recorded conflicts in the villages of Naitolia and Mswakini. Subsequently, there were debates about the extent to which the implementation of Randilen WMA represented a community-based approach (Brehony et al. 2018; Lee and Bond 2018a, b). It should be celebrated that, based on the recent research presented by Raycraft (Chap. 6), community members themselves now report Randilen WMA as a "community-based" approach.

[10] Most land in Tanzania is held under Customary Rights of Occupancy. These are land rights exercised through the organs of local governance administration, Village Councils and Village Assemblies. "Customary lands are defined as 'Village Lands' in the Land Act (URT 1999a, b), and the Village Land Act (URT 1999b) provides the legal basis for management and governance of these lands. Village lands held through customary rights of occupancy may be apportioned to individuals or groups through Certificates of Customary Rights of Occupancy (CCROs), which effectively formalizes their rights to that land" (Lekaita et al. 2014).

1999b), through the implementation of natural resource governing bylaws that stipulate penalties for misuse.[11] Even more importantly, where planning results in common land-use areas which were once more easily alienated from local citizens, such as communal grazing areas, UCRT are assisting villages to secure group Certificates of Customary Rights of Occupancy (CCROs).

5.3.7 Scaling Up

In social-ecological systems and landscape theory, scales of governance are critical (Arts et al. 2017; Cumming 2011; Ostrom 2007). In semi-arid rangelands, it is in the vested interests of pastoralists and agro-pastoralists to expand the scale of management to much larger landscapes (Sayer et al. 2013; Scarlett and Mckinney 2016). As we have described above, this is vital to sustain livelihood productivity and resilience, as well as to avoid the negative impacts of rangeland fragmentation (Groom and Western 2013; Hobbs et al. 2008b; Western et al. 2020).

As UCRT developed the concept of participatory land-use planning and natural resource management further, they realised that through participatory governance structures, several villages could join grazing lands that were already secured with communal CCROs, through Joint Rangeland Committees, which can then be formalised through legal Memorandums of Understanding[12] (see Figs. 5.1, 5.2, and 5.3).

Furthermore, scaling up once more, at the District level, a higher level committee, the District Rangelands Governance Advisory Committee exists to advise and coordinate the efforts of local Joint Rangeland Committees (see Figs. 5.1, 5.2, and 5.3). At each level, from the Village Rangeland Management Committees, to the Joint Rangeland Committees, and up to the District Rangeland Governance Advisory Committee, there are very clear rules about the composition of these committees (with regards to representation and justice) and their roles and responsibilities.

[11] In Tanzania, according to the 1977 Constitution (URT 1977), a village forms the Local Government Authority and once registered under the Local Government Act No.7 (URT 1982), it is mandated to enter into agreements which benefit village members, on behalf of village members, subject to the consent of the Village Assembly. The Village Land Act (URT 1999a, b: No. 5) mandates that village authorities manage and protect village lands on behalf of village members, and Section 11 mandates that village authorities can enter into joint agreements to use village lands.

[12] Legislation of land tenure in Tanzania provides the opportunity for two or more villages to share natural resources across village boundaries. The Village Land Act (URT 1999a, b), under section 11 and through Regulation 2002 No. 26–35, empowers village councils to enter into joint land-use agreements with other villages, to jointly plan, manage, and use joint natural resources. Furthermore, the Land Use Plan Act section 18 (URT 2007) provides for the formation of a Joint Village Land Use Plan authority, and in section 33 (1) (b), provides for the preparation of a joint "resource management sector plan" for the use and management of shared natural resources. Furthermore, once the Joint Village Land Use Plan has been finalised, the association of land owners can seek customary rights of occupancy over the land, in order to secure their rights to land tenure.

Importantly, these structures do not supersede other customary institutions of land management, but aim to work in tandem with them (UCRT and Simanjiro District Council 2019, and see Brehony 2020 for examples elsewhere).

These secured and connected lands are managed for local livelihoods, principally grazing for livestock. Indeed, as described by the Simanjiro District Council (which falls within the Tarangire Ecosystem), the primary aim of this scaling up in connectivity is driven by self-interest; to ensure access to resources beyond a single village's land (access to habitat heterogeneity), to mitigate land-use related conflicts, and to reduce food insecurity (UCRT and Simanjiro District Council 2019; UCRT 2010; Western et al. 2020). However, in so doing, provided villages continue to accept the presence of wild animals on their land, they also allow wild animals to access large landscape functional heterogeneity. As of 2019, in Simanjiro District alone, over 1.5 million acres of land have been secured under certificates of customary rights of occupancy as open, communal land. This is more than double the area of Tarangire National Park (UCRT and Simanjiro District Council 2019).

From this starting point, other stakeholders, such as conservation organisations can collaborate with local communities, to achieve joint goals, on the terms of the local citizens who stand to bear the greatest costs if things do not work out – those with the most skin in the game. Indeed, as Davis and Goldman (2019) discuss, such a starting point is more likely to result in achieving joint outcomes, for instance when proposing payments for ecosystem services. Furthermore, the approach we describe above is place-based and tailored to the particular social-ecological context in Tanzania and semi-arid rangelands more generally. It is driven by local challenges of land security and recognises the importance of local management and local livelihoods.

5.3.8 Limitations

Although we believe that this approach shows great promise, we are also cautious for a number of reasons. Firstly, Bluwstein (Chap. 2) calls into question the distinction between state controlled land-use planning which separates people and wild animals, and local level land-use zonation. We should not forget to ask: "who benefits most from these arrangements?" We cannot answer this convincingly, but hope that further research will examine this in greater detail. Nevertheless, we believe that if the primary concern remains meeting people's material needs, through a diversity of culturally and economically important livelihoods, by securing access to land and natural resources, then this approach will remain effective and legitimate.

Secondly, we acknowledge that these systems are necessarily less flexible than the aforementioned traditional systems. Particularly in semi-arid rangelands with significant spatial and temporal variability which is likely to increase (Haile et al. 2020), any land-use which is fixed in space can result in fragility, as opposed to resilience. Although Maasai governance systems have institutions which are well suited to thriving within these landscapes (Goldman 2006), we are yet to see whether

the aforementioned systems of land tenure and management which combine the formal and informal, will perform in a world of increasing social-ecological uncertainty. Greater attention needs to be paid to how approaches such as those we describe above, can maintain flexibility and become part of a more adaptable governance system (Brehony 2020).

Finally, from a governance perspective, the approaches we describe are founded on negotiation and consensus, an important starting point towards achieving the good governance trilemma of participation, legitimacy and effectiveness (Folke et al. 2005). However, even processes like these should not blind us to the reality that institutions of authority create power imbalances which can be abused for personal gain.

5.4 Rounding Off

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Service (IPBES) specifically recognises the critical role that local communities play in conservation, through their practices and detailed knowledge of ecosystems and biodiversity (IPBES 2021).[13] Indeed, at least 28% of the world's land surface is effectively managed to meet global conservation goals by local, indigenous communities (Garnett et al. 2018) under diverse forms of place-based stewardship (Díaz et al. 2019b). The future success of conservation efforts in East Africa's rangelands depends on these communities.

In the Tarangire Ecosystem, although processes of modernisation have resulted in land alienation and have eroded traditional landscape scale management systems, in this chapter we have highlighted some ongoing innovative approaches to overcome these challenges. Through spatial planning, local citizens have managed to secure land rights to communal land and resources, from the local to the regional scale. These approaches build on the local social-ecological context and provide a mechanism for continued access to landscape scale functional heterogeneity, which is critical for pastoralists and wild animals to overcome current and future social-ecological variability. Ultimately, this model creates a mixed-use coexistence landscape, where biodiversity conservation moves towards a land sparing-sharing continuum with a range of land-use options (Phalan 2018).

Although we have limited our focus to the innovations taking place in the Tarangire Ecosystem, these approaches are likely to be relevant to other social-ecological systems where solutions which combine informal and formal governance and practices, together with securing rights to land and resources for local livelihoods, are needed or are emerging. From a conservation, land ethic or *erematare* perspective, such tools can act to prevent the conversion of communal land and resources to other land uses and instead support local institutions to maintain rights

[13] A commitment captured under IPBES Objective 3 (b) "Enhanced recognition of and work with indigenous and local knowledge systems" (IPBES 2021).

to land and resources, and effectively manage these from the local to the landscape scale (Leopold 1949; Western et al. 2020). In so doing, they can continue to maintain resilient livelihoods, while also making a significant contribution to protecting ecosystems and wild animals (Reid et al. 2014).

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