Transcending the Boundaries of Conservation and Community Development to Achieve Long-Term Sustainability for People and Planet

E. M. Naro and L. L. Lichtenfeld

Abstract

In the current epoch of the *Anthropocene*, developing communities must be a driving force for positive environmental change. This chapter focuses on overcoming the trade-offs between environmental efforts and human development. It aims to provide the necessary tools to transcend the boundaries of conservation and community development. We define and describe social-ecological systems (SES) and the functional mindset change that must take place for practitioners and environmental managers to imagine a new conservation paradigm. We outline several "stages" of community engagement and strategies to employ at each stage, recognizing that flexibility is a crucial aspect of adjusting these strategies to differing contexts. Lastly, we describe three categories of problems to be addressed in community conservation and how to appropriately diagnose these problems through a case study from African People & Wildlife.

Keywords

Conservation · Community · Social-ecological systems · Development · Community-based conservation · Tanzania

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Introduction

The community of Loibor Siret in Manyara, Tanzania, is home to about 5000 people, many of whom lead the traditional pastoralist lifestyle of the Maasai tribe. Loibor Siret's communal pastures border the eastern side of Tarangire National Park, which is unfenced to allow for the natural migratory patterns of Tanzania's vast diversity of wildlife. This open corridor between the protected area and communal grazing lands, while ideal for conservation outcomes, leaves opportunity for conflict between people and wildlife. As in many pastoral cultures around the world, the Maasai living near Tarangire National Park often lose livestock to depredation by hyena (*Hyaenidae* sp.), leopard (*Panthera pardus*), lion (*Panthera leo*), African wild dog (*Lycaon pictus*), and cheetah (*Acinonyx jubatus*).

For pastoralists reliant on their livestock for food, income, and social status, conflict with predators is a significant problem (Mkonyi et al. 2017c). This problem is exacerbated by an increasing human population, cattle overstocking, climate change-induced shifts in seasonality, and competition between people and wildlife for limited water resources in the Tarangire-Manyara ecosystem (about 15,500 km^2). Historically, many pastoralists in Loibor Siret focused on techniques to reduce this conflict by fortifying their cattle corrals, or bomas, with thorn brush gathered from the surrounding area or retaliating

S. C. Underkoffler, H. R. Adams (eds.), *Wildlife Biodiversity Conservation*,
https://doi.org/10.1007/978-3-030-64682-0_2

against predators by setting traps, poisoning carcasses, and spearing (Mkonyi et al. 2017b). While it is often young men who partake in retaliatory killings, women are primarily responsible for securing the boma and homestead against predators.

Frequent boma fortification causes a myriad of conservation, development, and women's empowerment challenges. Thorn brush bomas that require frequent maintenance can lead to conservation challenges due to the necessary shrub collection and tree cutting. Areas surrounding bomas demonstrate deforestation and degradation characteristics, fragmenting the landscape and requiring women to travel further from the boma to gather necessary maintenance materials (Mkonyi et al. 2017a). Further, women spend a significant amount of time gathering thorn brush and rebuilding gaps in the boma, thus resulting in limited time for other income-generating or social activities. And finally, when predators do attack a boma, blame is often put on the women responsible for boma maintenance, leading to potential domestic abuse or loss of social capital.

The scenarios above are far from unique for people living near protected areas and coexisting with predators. Similar cases can be found around the world, including outside Yellowstone National Park where cattle ranchers struggle to live with gray wolves (Nelson et al. 2016), near the Bandhavgarh Tiger Reserve in India where tigers are responsible for nearly 82% of livestock depredation events (Chouksey et al. 2018), and by Parque Nacional Queulat in Chile where farmers report frequent conflict with pumas (Rodriguez et al. 2019).

For these people, along with communities all around the world suffering from human-wildlife conflict (HWC), conservation and human development seem to be mutually exclusive goals. Tolerance of predators is sometimes low, and their value is often perceived to be primarily related to tourism (APW 2019). In conventional discourse on the topic, trade-offs between conservation and community development goals are inherent (Oldekop et al. 2016). Yet in a time of human population growth, climate change, and biodiversity loss, seeking to transcend these trade-offs and find solutions that benefit both people and wildlife is imperative. This chapter focuses on tools for pushing the boundaries of conservation and development, identifying areas where win-win solutions are possible, and imagining a new conservation paradigm in which human and natural systems are in balance.

Learning Objectives

Many of our existing environmental challenges today stem not from poor resource management at a local level, but rather from resource overuse in the most developed countries on the planet. The systems used to manage resources a thousand years ago may not be feasible or significant enough to solve our current problems in a world with nearly 8 billion humans and a rapidly changing climate. Thus, we recognize the need for formally protected areas, international regulations, and large-scale environmental action. But this does not detract from the necessity of community-level efforts, nor does it suggest that traditional systems are outdated or ineffective. Instead, it provides an opportunity to amplify the voices of local people, scale indigenous knowledge, and inspire adaptation and innovation.

Humanity's profound influence on every ecosystem on earth is such that small-scale conservation initiatives or those of protected areas in isolation—while very effective—are not sufficient on their own. These efforts must be grounded in a global movement toward sustainable living that does not merely move environmental destruction to less visible landscapes but removes it entirely. In the new epoch of the *Anthropocene*, developing communities must be a driving force for environmental change.

This chapter aims to provide the necessary tools to transcend the boundaries of conservation and community development. We begin with identifying some primary challenges faced in the past when working at the intersection of conservation and community development and those that remain to be addressed. We define and

describe social-ecological systems (SES) and the functional mindset change that must take place for practitioners and environmental managers to imagine a new conservation paradigm. We outline several "stages" of community engagement and strategies to employ at each stage, recognizing that flexibility is a crucial aspect of adjusting these strategies to differing contexts. Lastly, we describe the three types of problems to be addressed in community conservation and how to appropriately diagnose these problems through a case study from African People & Wildlife.

Challenges to Past and Current Strategies

The history of community engagement in conservation provides modern practitioners with many lessons learned as well as pitfalls to avoid. In the nearly 50 years since conservationists have actively incorporated local people into environmental initiatives, four overarching critiques of community engagement strategies have emerged. This section, derived from *Community, Conservation, and Collaboration: A Framework for Success* (Lichtenfeld et al. 2019), explores each of these critiques and provides guidance to avoid them going forward. The full framework text can be found at africanpeoplewildlife.org/community-conservation-collaboration.

Romanticizing Community

In visiting the community of Loibor Siret, or any number of other Maasai communities, you may have a difficult time locating an individual who does not have a cell phone, seeing a shop without power, or finding a young adult without a social media presence. Despite these signs of globalization and development reaching extremely rural communities, the Maasai remain one of the most romanticized people on the planet today.

There is no barrier to the synergy between conservation and community development greater than that of romanticizing rural communities. The concept of *indigenous* has often been used synonymously with *primitive* and, by association, "ecologically noble" (Redford 1991). Where it exists, this perception further deepens the schism between community development and conservation goals. It suggests that indigenous people should not adopt modern technology or practices in the name of progress or to further their livelihoods. Cronon (1995) refers to the problematic wilderness ideology of romanticizing indigenous communities until they "do something unprimitive, modern, and unnatural, and thereby fall from environmental grace" as early as 1995, though it is still one of the most common pitfalls in community engagement today.

Homogenous Perspectives

From NGO websites to government reports (and even within this very chapter), the term "community" is often used vaguely to refer to local people. While this is sometimes for the sake of brevity, it can have the problematic consequence of oversimplifying the social system within that community. Oversimplifying community can lead to homogenizing the needs and perspectives of the individuals within it, thereby ignoring marginalized groups, further disenfranchising the vulnerable, and intensifying existing social imbalances (Agrawal and Gibson 1999; Waylen et al. 2013). Practitioners seeking to transcend the boundaries of conservation and community development must actively combat this homogenization by embracing complexity in social systems. Much of this chapter is dedicated to techniques and tools that can be used to assess different perspectives, understand social systems, and recognize complexity even in small, rural communities.

Imbalance of Benefits

As discussed above, conventional thought on conservation and community development is that the two are naturally at odds. Trade-offs are

considered unfortunate (though necessary) management decisions for environmentalists and development practitioners alike (Alcorn 1993). Thus, the third overarching critique of community engagement strategies discussed here is the assumption that benefits cannot be balanced. Many programs throughout the history of conservation and development have claimed benefits for people and nature, but rarely can they claim that these benefits have been equitable (Oldekop et al. 2016). Conservation programs may marginally benefit a nearby community, and development programs may "do no harm" to the environment, but long-term sustainable benefits for both have been challenging to achieve.

Yet community-driven conservation programs are becoming more prevalent, and practitioners are becoming more knowledgeable about their social and ecological impact. Cases of win-win scenarios are emerging, and best practices to achieve these outcomes are being disseminated more and more frequently (Mkonyi et al. 2017a). This chapter seeks to contribute to the body of literature by continuing to demonstrate that community development and conservation need not contradict each other.

Illusion of Involvement

This last critique encompasses parts of the previous three. Many conservation initiatives in the past have sought to involve communities in some way. Yet some have either romanticized a community's history of natural resource management, homogenized their perspectives by reducing participation to only one subgroup in a community, or focused so heavily on the ecological outcomes that any planned social benefits were lost. This critique is often the result of well-intentioned conservationists seeking to engage communities but without the resources or experience to do so meaningfully.

The appearance of community participation in programs does not reflect legitimate investment in positive conservation outcomes. It does not reflect community ownership of programs or empowerment to begin new initiatives. Most importantly, it does not mean that such programs will be sustainable in the long term. Genuine community engagement requires much more than participation in meetings and a few local staff implementing activities. It requires long-term relationship building, mindset and behavior change, and a deep sense of trust and partnership between the community and the practitioners. In the long term, it requires that the community becomes the practitioner.

Social-Ecological Systems

In contrast to the problematic human-nature dualism that has dominated conservation thought for decades, social-ecological systems thinking provides a model for integrating social, human-centered systems with natural and ecological systems. Humans are, in fact, no less a part of the natural world than our closest primate relatives (Schmitz 2018). A social-ecological system is "the integration of both the natural and social sciences with systems theory, recognizing the interdependent interactions between biology, ecology, and social systems" (Lichtenfeld et al. 2019). Understanding the world through a social-ecological systems model allows for practitioners to see the complexity inherent in the system without becoming overwhelmed by it. Embracing this complexity is crucial for developing adaptable solutions to both conservation and development problems. Here, we parse out the varied elements in most social-ecological systems, providing examples of each and demonstrating the interaction effects between them.

Social Aspects

We begin with the social elements of a social-ecological system. Fundamentally, social systems revolve around individuals, groups, and institutions. Although groups and institutions are both comprised of individuals, the legal, economic, or political power of larger social structures can amplify or dilute the values of the component individuals. Thus, groups and

institutions can be considered separate elements in social systems with values derived from, though not identical to, the values of individual members. This distinction between individuals and the larger structures they create can manifest in "mob mentality"—where the values of individuals within a group are compounded by other members and the group espouses a stronger form of those values than each individual member—or a "social contract," where individual instincts are weakened to conform to the values of the group or institution and thereby maintain social order.

More broadly, social systems incorporate the principles required for the system to function, the relationships between each element, and the values espoused at each level. The following section delves deeper into each of these concepts.

Principles Required for Social Systems to Function

Unsurprisingly, the principles paramount in functioning social systems reflect the principles conservation practitioners must also bear in mind when engaging with rural communities. Many lists of social system principles exist and are applicable in all societal levels from individual workplaces to small communities to international organizations. Most compilations of principles include variations of the following:

- Flexibility
  Social systems require flexibility to function in the long term. Social systems must remain adaptable to changing conditions and responsive to the needs of the individuals, groups, and institutions within them and adjust in a timely and relevant manner.
- Trust
  Social systems require a level of trust between individuals, groups, and institutions to function effectively. Each element in a social system must trust that inclusion in the system will provide more benefits than exclusion. Trust is strongest when the benefits for each element are transparent, equitable, and reciprocal.
- Participation
  Social systems are most functional when they incorporate a significant percentage of the individuals, groups, and institutions within them. Participation in the system should be appealing, while removal from the system should seem detrimental to the success of the individual, group, or institution.
- Respect
  Social systems function more effectively when each element in the system has value to add, recognizes the importance of the other elements, and seeks to uphold the system as a whole. When elements in a social system lose respect for other elements or for the system itself, the system is vulnerable to loss of participation or collapse.

Equality vs. Equity: Relationships Between Elements of a Social System

In all social systems, when these principles are not upheld, dissent and discord emerge. A lack of flexibility may reduce the level of trust that individuals, groups, and institutions have in the system, leading to decreased respect and participation. A common issue with inflexible social systems is the growth of inequity between individuals, groups, or institutions, often caused by the confounding of equity with equality.

Inequity and inequality are not interchangeable terms. Inequity refers to injustice or unfairness, whereas inequality refers to uneven distribution of services or resources. For example, a social program which provides the same financial support to all people regardless of their current financial needs, such as an economic stimulus, ensures equality but not equitability. On the other hand, a social program that specifically assists the most financially vulnerable people seeks to create equity, though the financial support is not equal. In short, equity implies fairness, while equality implies sameness.

Confusing the two terms and thereby the policies implemented to address them can exacerbate existing social and economic imbalances. If a social system is not flexible enough to shift between policies addressing inequality and those addressing inequity, the system is vulnerable.

When working in community development, it is critical for the components of a social system to address inequity. The institutions and groups in place to protect the values of individuals must respond to the inequitable distribution of resources. As these resources are often environmental or ecological, an SES model helps define the relationship between institutions, individuals, and natural resources.

Values in a Social System and the Governance Structures Upholding Them

People create governance institutions as a means to protect their base values, and differing base values among individuals are the foundation of different political groups, parties, and governance structures. Understanding the function of governance structures is a critical component of understanding broader social-ecological systems. Regardless of the type and structure of government in power, the social purpose and function of governance is to preserve and protect core human values (Clark and Wallace 2015).

These values, described by Lasswell and depicted in Fig. 1, exist in all individuals, though the ratio between these values reflects the different perspectives those individuals (and the groups or institutions they comprise) espouse (Lasswell 1970). For instance, some individuals may value wealth significantly more than skill, while others may value affection above all. Understanding individuals' core value ratios can provide unparalleled insight into their decision-making process. On a social system level, understanding group and institution core value ratios can highlight the priorities of the entire society. Where value ratios differ greatly between components of a social system, we can expect to see political or religious conflict at its worst, or healthy, compromising debate at its best.

As human-created institutions, governance structures are dependent on the individual to retain authority and command respect. If governance institutions fail to preserve the values of the individual (or some portion of individuals depending on the type of government), the individuals will seek a change in authority by means of a transition of power mechanism. Historically, these transitions of power can be anywhere on the spectrum from entirely peaceful to violent overthrow. Regardless of the mechanism through which individuals seek change in authority, principles of good governance and human values are intimately linked and interdependent (Lasswell 1970; Clark and Clark 2002; Lockwood 2010).

Economics of Natural Capital

The last element of a social system crucial to the comprehension of an SES is the economic element. Social systems and economic systems are intimately linked, influencing each other and co-evolving. A society's economic system impacts the mindset of the individuals within it and the policies implemented by its institutions. For instance, socialist economic systems influence the development of individuals within those systems from birth. Capitalist economic systems do likewise, affecting the values, goals, and priorities of the people educated and employed in those systems.

The economics of a social system depend heavily on the human and natural resources in that system. As stated above, the human resources are molded through membership in the system and are driven by core human values. The natural resources both are a driver of the economic system and can be impacted by that system in turn. To truly grasp the social aspects of an SES, we must understand the concept of natural capital.

Natural capital includes all of the world's natural assets, that is, natural resources and the ecosystem services they provide (Costanza and Daly 1992). Since natural capital is an input in all products humans use to survive and thrive, it must be included in economic models and considered in economic decisions (Fenichel et al. 2018). However, many economic systems in the developed world, and increasingly in the developing world, undervalue natural capital or fail to recognize its limits. All social systems today have institutions that allow individuals to buy, trade, or use products. However, many of these systems do not account for the raw natural capital inputs when valuing these products. For instance, the

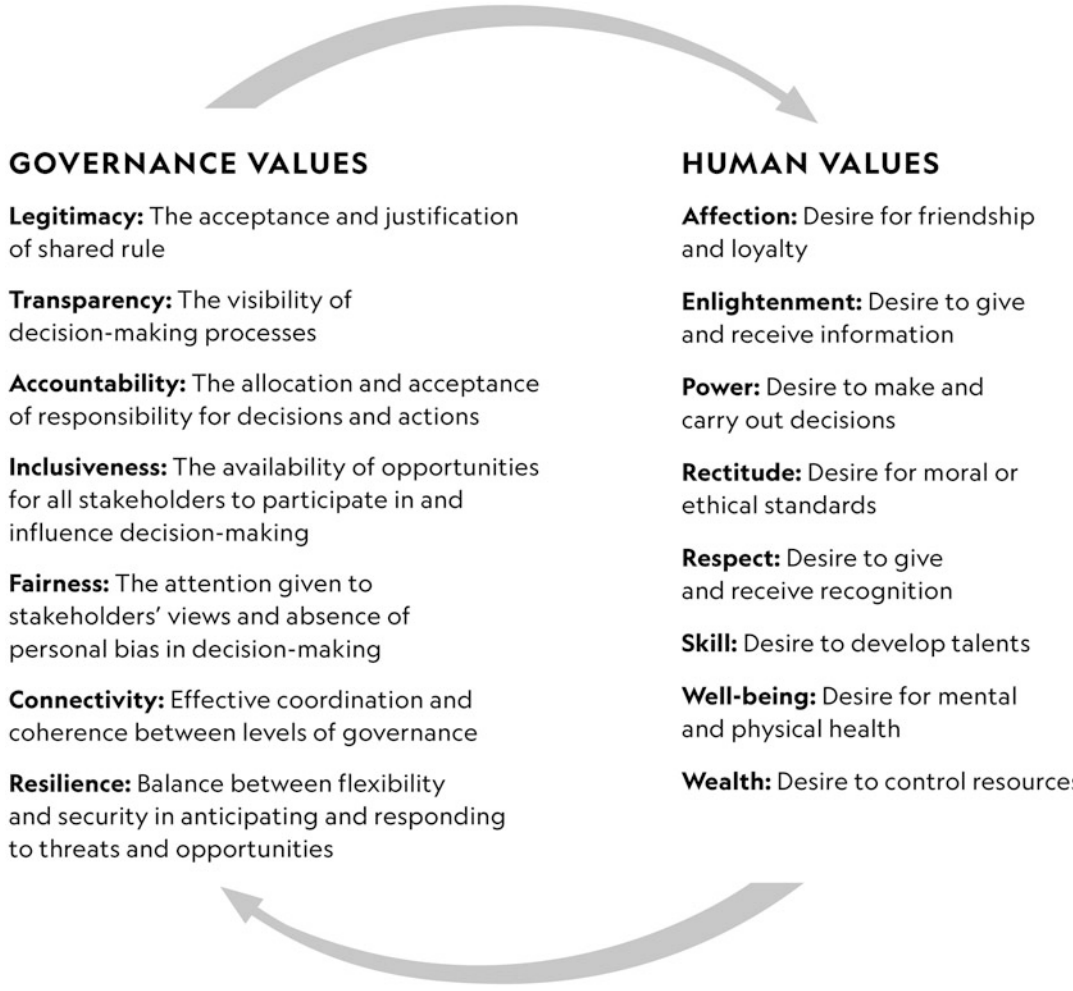


Fig. 1 Interdependent relationships between governance values and human values

cost of a piece of furniture may include the value of the timber, human labor, and associated trade fees. Yet it often overlooks the value of the ecosystem services lost in removing the timber-producing tree from an ecological system and the value of the soil that enabled the tree to grow in the first place. While this may be a small issue for individual products or communities, undervaluing natural capital on a global scale can create an economic system collapse in the long term.

Such non-optimized economic systems can lead to the inefficient or inequitable distribution of resources, the collapse of ecosystem services, and the degradation of critical natural stocks, ultimately causing significant losses in value and well-being (Fenichel et al. 2018). Thus, conservation practitioners seeking to understand the social-ecological systems in which they work must incorporate economic value modeling into their initial assessments. The discussion of the economics of natural capital provides a seamless transition between the social and ecological aspects of an SES. In the next section, we delve deeper into the ecological aspects of an SES, keeping in mind the natural capital value of ecosystem services and how their loss can affect social systems.

Ecological Aspects

As discussed above, the link between social and ecological aspects of an SES often lies in natural capital. Societies are dependent on the natural resources surrounding them, and these natural resources are significantly impacted by the people who use them. Generally, the ecological elements of an SES can be categorized into living resources, non-living resources, and the interactions between them. Importantly, the interactions between living and non-living elements of an ecological system constitute a complex adaptive system (CAS). A CAS is a system in which each component may change and have unpredictable effects on the whole (Lichtenfeld et al. 2019). Several examples of CAS are described below.

Living Resources

We begin with discussing living resources, recognizing that humans are both a living resource in ecological systems and also the primary element in social systems. Living resources also include much more than commonly referenced animal species; they include all extant plant life, fungi, algae, and bacteria. All living elements have some dependency on non-living elements and, in most cases, reliance on other living resources.

There is a wealth of diversity in the living elements in an ecological system, from variety in feeding patterns to locomotion to suitable habitat. Life on earth has been found in even the most unlikely places, like the thermophilic bacteria found in the hot springs of Yellowstone (Meyer-Dombard et al. 2005) or the tadpole shrimp (*Triops granarius*) found in the temporary pools of Qatar (Shama 1997). This diversity is both beautiful and functional. The result of millennia of evolution, functional diversity in living elements ensures the homeostasis of ecological systems. Further, each species' niche allows it some degree of distinction or competitive advantage in a certain context.

Within functional clades and intraspecies, particularly in biodiversity hotspots, negative density dependence is relatively common (Peters 2003; Johnson et al. 2012). This trait refers to the influence of species density on its survival. For instance, if many seedlings of a particular species or species with similar functions are densely located, they are likely to compete for the same limited resources and have a low survival rate. The great diversity in function and habitat requirements among living elements is necessary for the survival of many species, including humans.

Lastly, the diversity of living elements ensures whole ecosystem functioning. Living elements are commonly categorized by feeding type or trophic level. As a general though not perfect rule, each trophic level has an ecological efficiency of approximately 10% of the previous level. In other words, there are about ten times as much biomass in primary producers as there is in herbivores and about ten times as much biomass in herbivores as there is in carnivores in any given community (Pimm and Lawton 1977). This forms the basis of the relationship between trophic levels and highlights the importance of understanding trophic cascades. Trophic cascades represent a CAS in which a change in one trophic level can have an exponentially more significant (or cascading) effect on other levels (Schmitz 2003; Ripple et al. 2016). For example, if apex predators are removed from an ecosystem, hunting pressure on herbivores is reduced, which can lead to increased herbivory and, in turn, degraded grasslands or riparian areas. As these areas provide critical habitat for a myriad of other species, many of which are necessary pollinators and seed dispersers, their degradation has cascading effects on the entire ecological system. In short, the relationships between trophic levels are critical to the healthy functioning of ecological systems, and understanding them is a vital part of understanding SES.

Non-living Resources

Next, we look into the non-living resources in an ecological system. These include air, water, minerals, and sunlight, among others. As mentioned above, the sustainability of non-living resources is necessary for all life. Yet unlike

living beings, non-living elements cannot migrate to ensure their sustainability or make decisions about their existence.

Although each non-living resource could have books dedicated specifically to it (and most do), we will focus on water as it exemplifies the complexity and variability in ecological systems. Water covers about 71% of the earth's surface, with oceans holding over 96.5% of that water (USGS 1984). The rest exists as water vapor in the air (0.001%), in rivers and lakes (0.007%), as ice in glaciers and the polar ice caps (1.74%), in groundwater and permafrost (1.71%), and of course in all living things (0.0001%) (Gleick 1993).

While the earth's water supply is constant, the state and location of that water are ever-changing. The water cycle includes many of the processes observable on a daily basis: precipitation, infiltration, evaporation, transpiration, sublimation, cloud transportation, and condensation (NASA 2019). It also includes less tangible processes such as percolation, plant uptake, groundwater flow, runoff, and snowmelt (NASA 2019). These processes regulate the amount of water accessible to living things, and even small rate shifts can cause significant ecological change. For instance, changes in rainfall, sunlight, or soil infiltration can have extreme effects on living resources, such as grasslands including desertification, flooding, erosion, or general degradation. In turn, this affects the herbivores dependent on those grasses. These effects can further cascade through the trophic levels, impacting the entire system and even neighboring systems as living elements migrate to survive.

In this time of climate change, a focus on the non-living elements of an ecological system is more important than ever. Changes in weather patterns, the water cycle, soil composition, and even coastal boundaries threaten living elements in the system. Despite many species' adaptability, rapidly changing climatic conditions could cause mass extinction. Yet, many non-living elements are in abundance or renewable, even if not equally distributed (of course, this brings back the concept of equity in natural capital, since no part of an SES exists in a vacuum). So, these non-living resources can also serve as solutions to many of the challenges caused by their changing conditions. Solar and wind energy are some of the most common examples of this today. Still, living elements in ecological systems were engineering non-living resources to their benefit long before modern energy issues.

Interactions Between Ecological Elements

The last element of an ecological system critical to the understanding of SES is the interaction between living and non-living resources. Several examples have already been provided, including the relationship between water, sunlight, grasslands, and herbivores. However, no discussion of ecological systems is complete without incorporating the concept of ecosystem engineering.

Ecosystem engineering is the process by which living elements in an ecological system significantly modify their habitat through interactions with non-living or other living resources (Jones et al. 1994). These interactions are sometimes parasitic but often mutually beneficial and can result in coevolution over time. Ecosystem engineering is another example of a CAS, as the long-term and cascading effects of living elements on their environment are often unpredictable and interdependent.

A classic example of ecosystem engineering is the creation of natural dams by beavers (*Castor canadensis*). In much of North America, beaver dams drastically alter riparian ecosystems and create wetlands. The formation of wetlands as a result of beaver activity increases habitat heterogeneity, which in turn increases species richness on a landscape scale (Wright et al. 2002). This escalation in diversity facilitates a positive feedback loop; more plant diversity means more habitat options for a further increase in species richness. Thus, the interactions between beavers, water, and woody plants create whole ecosystems.

There are innumerable examples of ecosystem engineering, from frugivorous primates dispersing significant amounts of fruit tree seeds (Chapman et al. 2013) to plankton altering the light regimes in marine ecosystems and thereby

controlling the depth at which other organisms can survive (Breitburg et al. 2010). But perhaps no species in history has had more impact on the environment than *Homo sapiens*. Humans have served as ecosystem engineers by drilling for oil to generate energy; setting aside specific areas of land for tourism, hunting, or conservation; and undertaking a variety of actions resulting in climate change. And with this recognition that humans are both the primary actors in social systems and extremely influential actors in ecological systems, we can begin to understand social-ecological systems in the Anthropocene.

Systems Thinking

The previous two sections have referenced social systems, ecological systems, and complex adaptive systems. But we have not yet explored the last aspect of SES—the systems thinking approach. Systems thinking requires a functional understanding of the components as described above, but more importantly, it requires analytical capacity and innovation. It is comparatively easy to recognize issues in a system when it has begun to show symptoms of corruption. It is much harder to predict challenges that have not yet demonstrated detectable signs, through simply reading the signals in the system.

Systems thinking provides a lens through which individuals can read these signals, anticipate unintended outcomes, and adapt as needed. It is a holistic approach to recognizing non-linear cause and effect models, interrelated and interdependent constituents, and how systems work in the context of larger systems (Schmitz 2018). Often, systems thinking results in a mechanism called adaptive management (Cundill et al. 2012). From savvy investors to conservation practitioners, the systems thinking approach is key to successful initiatives.

Scenario 1

Consider a hypothetical SES in a primarily pastoralist buffer zone of a protected area which houses high-profile predator species. Due to high unemployment rates in the area, alcohol dependence is high, and young people in a community often seek financial resources through whatever means available. Since the protected area is so close, the region has a significant tourism industry. To facilitate tourism and boost the economy of the region, the government partners with foreign investors to build infrastructure. In the foreign investor's home country, there is a high demand for illegal wildlife products, particularly the skins and bones of big cats. Poaching syndicates, therefore, target the vulnerable youth of the community for recruitment into poaching operations. As a result, over the course of a decade, the population of large felines in the region plummets. With fewer apex predators in the ecosystem, herbivore populations rise. The increased herbivory on grasslands along with a drying climate causes the buffer zone pastures shared by wildlife and livestock to degrade. Despite restoration efforts, overgrazing pressure threatens the pastoralists' livelihoods, as their livestock compete for limited pasture resources. Many pastoralists begin growing corn and beans, hoping to supplement their income with agriculture. As more land is converted from pasture to agriculture, crop-raiding from elephants increases. Frustration in the community rises as economic opportunities seem to disappear, and livelihoods and cultural values are threatened. This frustration leads to increased vulnerability among the youth to recruitment by poaching syndicates.

The system described in scenario 1 may be hypothetical, but it represents real events and interactions that occur in social-ecological systems around the globe. There are several noteworthy points to be considered in this example:

- The social aspects of the system include lifestyle and livelihood preferences of individuals, economic conditions outside the control of the individuals, global forces that impact local ecological systems, and human values that drive decision-making.
- The ecological aspects of the system include trophic cascades, top-down controls of predators, negative density dependence of wild herbivores and livestock, and changes in the water cycle and soil composition as a result of land allocation shifts.
- The systems thinking aspect of the case involves the unpredictable effect of improved infrastructure on organized crime, the unanticipated increase in human-wildlife conflict as a result of lifestyle change, and the feedback loops of unemployment-generated boredom increasing alcohol dependency and consequently increasing vulnerability of rural youth.

In such complex and unpredictable systems, conservation and development practitioners must seek solutions that address the social and ecological problems simultaneously. Understanding SES is a key first step in transcending the boundaries of community development and conservation. By viewing the challenges we face through an SES lens, we are more likely to anticipate unintended outcomes, recognize when serious issues are left unaddressed, and remain cognizant of the impact of programming on all life, human and wild.

Community Engagement Approach

Understanding the theory behind social-ecological systems is entirely different from putting that theory into practice. In this section, we provide actionable steps for practitioners seeking to transcend the boundaries of community development and conservation via African People & Wildlife's ACTIVE approach to community engagement, found in Fig. 2. While these are listed and described in a certain order, it is critical to remember that community engagement is a flexible process and no stepwise model can encompass its complexity. Therefore, these steps should be viewed more as guidelines of an approach rather than chronological actions.

Access

Accessing a community with which to partner for conservation initiatives requires time. This may mean spending months building relationships with key community members, attending community events, and listening to community needs before bringing up the topic of conservation programming. An initial assessment of the community and general interests can be formal or informal, but is undoubtedly a necessity.

Perhaps the most foundational step in accessing a community is to recognize the feature(s) that bind the community together. Communities share a geographic location, but usually, there are much deeper ties than locality. History, culture, language, religion, ethnicity, and race are just a few of the potential binding factors within a community. These factors often lead to similarities in core human values, as discussed previously.

Of course, to avoid the pitfall of homogenizing community perspectives, initial assessments should seek to identify how community subgroups differ, i.e., what factors bind subgroups together and how do the core human values of the various subgroups complement or contradict each other. Accepting and even embracing complexity in communities is key to understanding the social aspects of the SES in which the community exists.

Stakeholder analysis is a strong place to begin exploring the differential value systems in a society. There are a myriad of tools and resources for conducting stakeholder analyses, formally or informally. African People & Wildlife's community engagement toolkit can be found at https://africanpeoplewildlife.org/community-conservation-collaboration, with tools 5.1 and 5.2 providing guidance on stakeholder analysis. A thorough stakeholder analysis will include an assessment of all three components of a social

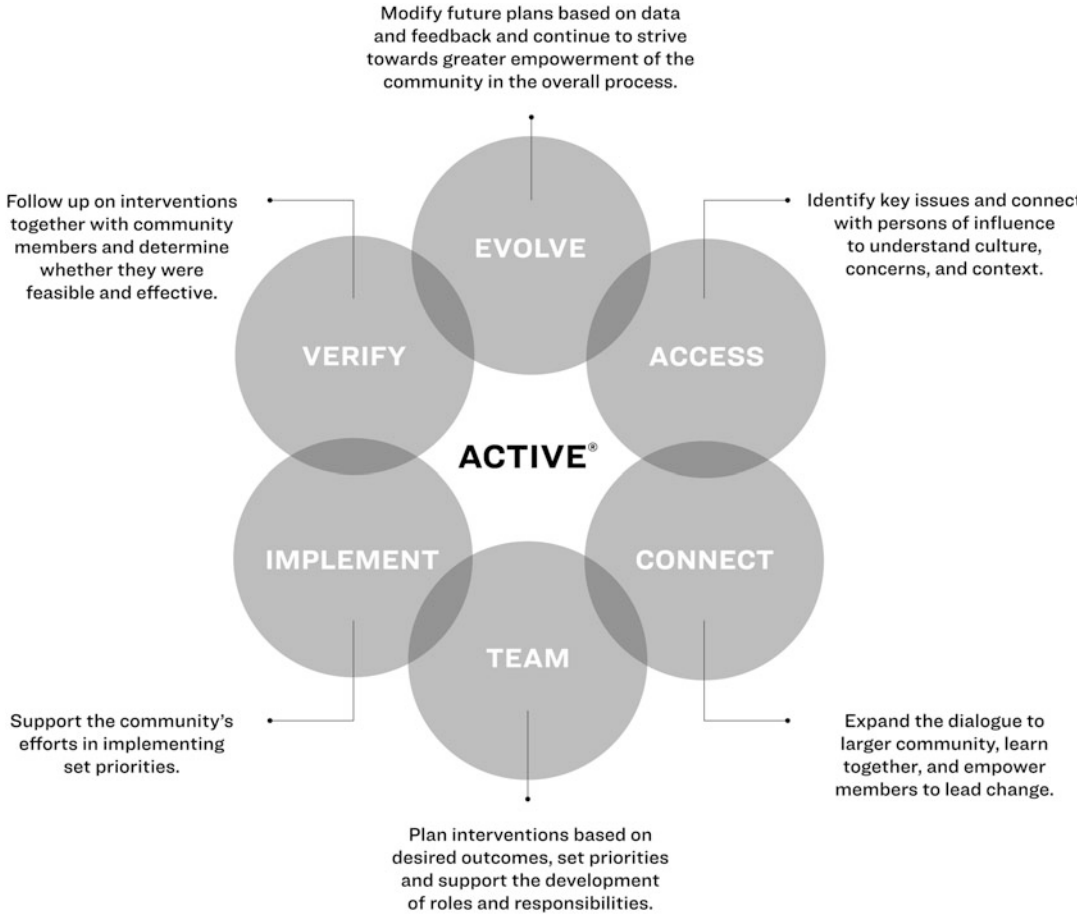


Fig. 2 African People & Wildlife ACTIVE approach to community engagement

system: individuals, groups, and institutions. By assessing multiple levels of a societal structure, we can better recognize the relationships between the components and thereby appreciate the complexity of the system.

Most stakeholder analysis guides recommend beginning with a brainstorming session to identify stakeholders for assessment. Throughout the process of assessment, however, more stakeholders may emerge, while others initially included may seem irrelevant. Maintaining flexibility is key.

Value assessment is perhaps the most useful form of stakeholder analysis for understanding the social aspect of an SES. For assessing individuals and groups (and to some extent institutions), Lasswell's eight core human values can be applied. Each stakeholder can be rated by how much weight it gives each of the eight values, described in Fig. 1. From these rating, value ratios can be determined and compared between stakeholders.

Power ranking is another form of stakeholder analysis that is particularly crucial for understanding the relationships between components of a social system. The power ranking model allows users to compare the political, economic, social, and cultural power of various stakeholders. While those four categories can be broadly applied in most contexts, other power dimensions can be added to fit the context of the social system (additional power dimensions could include legal, religious, financial, etc.). See Box 1 for more details on power ranking.

Box 1 Power Ranking and Radargrams
Power ranking tools often ask the assessor to rank each stakeholder on a scale of 1 to 5, with 1 demonstrating very little influence of the power dimension in question and 5 demonstrating significant influence in that dimension. Radargrams provide a useful way to visualize the results of a power ranking stakeholder analysis.

- *Political* power refers to a stakeholder's influence over local, national, or international governance, laws, and political systems.
- *Economic* power applies to the stakeholder's ability to influence funding as well as their power over local markets and economies.
- *Social* power relates to the stakeholder's influence on societal structures and behavior through thought leadership, perceived importance, or general respect within a community.
- *Cultural* power relates to the influence a stakeholder can have over the beliefs, practices, traditions, and values of a society as well as individuals.

To truly access a community, practitioners may require the support of community champions. A community champion is a member of the target community who is knowledgeable about community structure, has connections with community leadership, and is willing to facilitate introductions to other people. The community champion(s) can ensure that practitioners have access to the appropriate people to begin discussions about conservation programming.

Connect

With the facilitation of a community champion and the foundational understanding of community dynamics, practitioners can begin connecting with the broader community and leadership. Visioning workshops with communities can be beneficial for strengthening relationships and establishing a presence in the community. Similar to the strategies for inclusive participation discussed above, there are several strategies practitioners can use to connect with communities during visioning workshops and foster strong partnerships.

- Joint facilitation: Visioning workshops should be facilitated jointly by community leadership and the practitioner. This allows community members to be more connected to the process rather than observing the process happening around them.
- Language inclusion: Translators should be present to allow community members from different subgroups the opportunity to understand the proceedings and voice their perspectives.
- Disaggregation: Especially in communities with distinct subgroups and vulnerable or minority populations, offering separate visioning workshops for these groups can ensure they feel comfortable voicing their opinions. In particular, offering workshops specifically for women can be beneficial.
- Mirroring: Conduct visioning workshops in a manner similar to any regular community meeting. Mirroring the location, agenda, and protocol of existing structures can ensure that practitioners are genuinely connected to the community decision process and not distinct from it.

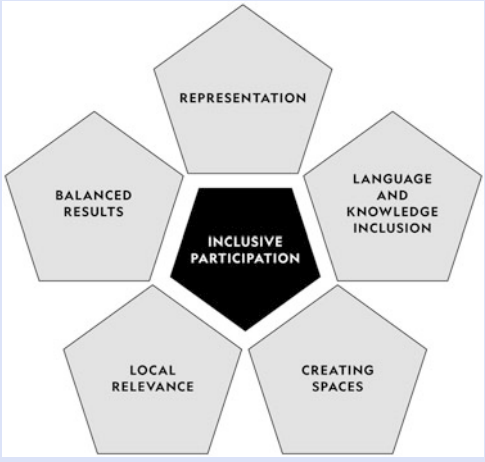
By the end of visioning workshops, of which there may be many, the practitioner and the community should have a clear sense of the other's values, goals, and objectives. Creating a shared goal document is a positive way to begin a partnership. The practitioner may have conservation goals beyond those of the community, and the community may have development goals beyond those of the practitioner. However, many goals will likely overlap or complement one another. Focusing on these shared goals, which address both conservation and development needs, is a

key initial step in transcending the boundaries between conservation and development.

Box 2 Ensuring Inclusivity

For practitioners attempting to transcend the boundaries of conservation and community development, including the perspectives of marginalized groups is a necessity. Yet while physical inclusion is frequent via community meetings or stakeholder engagement forums, real and active participation of vulnerable populations is more challenging.

Several strategies can be used to ensure that all relevant components of a social system are included substantially in conservation and community development initiatives.



1. Practitioners should reach out to minority members of a social system (individuals, groups, or institutions) and create opportunities for those members to access initiatives. This may include providing transportation, relocating events to more rural areas, or offering separate gender-disaggregated meetings.
2. Practitioners should ensure that translators are present at initiative meetings or activities and encourage marginalized social groups to contribute traditional knowledge. Allow for this knowledge to be shared via music, dance, story, etc., rather than just through formal writings or records.
3. Practitioners should be available frequently and actively present in a social system. Both informal and formal spaces for feedback, idea sharing, and debate should be accessible for marginalized or vulnerable populations.
4. Practitioners should assure that conservation initiatives are co-designed with broad representation from members of the social system, particularly to link conservation goals with community development needs. Initiatives are more successful when they are relevant to both majority and minority groups in a system.
5. Practitioners should aim to balance the results of programming so that marginalized members are not excluded. This relates to the distinction between equal and equitable benefit distribution. For instance, initiatives explicitly aimed at women or minorities can strengthen the trust those members have in the social system and its benefits.

Team

Practitioners should aim to team with communities, rather than implement programs at or for them. This begins with defining shared goals, as described above, and continues with jointly assessing strengths, weaknesses, opportunities, and threats. SWOT analysis was designed initially for business ventures but can easily be applied to conservation and development work, organizational capacity, and community engagement. This commonly used strategic planning technique helps committees or other planning teams to understand their assets, capacities, needs, and challenges.

The following questions can be used by a facilitator to lead the SWOT process. This process should include community leadership, practitioners, and other community stakeholders who may be involved with joint programming.

- *S*trengths: What ecological, social, political, and economic assets do we have as a community and as individual subgroups?
- *W*eaknesses: What ecological, social, political, and economic capacities do we lack, which may limit our ability to achieve our goals? This area of discussion could culminate in highlighting potential partnerships that could fill these gaps.
- *O*pportunities: What external ecological, social, political, and economic factors can we use to achieve our goals?
- *T*hreats: What external ecological, social, political, and economic challenges may threaten programming and the achievement of our goals?

In addition to identifying key factors for potential program success, conducting SWOT analyses as a team can deepen the trust communities have in the practitioner and vice versa. Results from a SWOT analysis are most valuable when shared transparently with community members and used to inform program design.

Co-designing activities with communities is a natural next step after conducting a SWOT analysis. Many practitioners may already have activities in mind, based on values, past programs, or donor requirements. However, implementing pre-determined programs in a community is a sure way to strengthen the barriers between conservation and community development. Pre-determined programs are likely to overlook community needs and values, not align with existing governance structures, and ultimately lose the support of community members and leadership. Instead, practitioners and their community partners must undergo the process of backward mapping to truly co-design activities. See Box 3 for more detail on backward mapping.

Box 3 Co-designing Activities Through Backward Mapping

Backward mapping is the process by which we create a theory of change. A theory of change is a cause-and-effect hypothesis, or model, for how a suite of activities will achieve their goals. Backward mapping begins with the shared goals determined during visioning workshops and, using the assets and capacities identified during SWOT analysis, generates ideas for how to achieve those goals.

Usually led by a facilitator, this process works backward from shared goals through cause-and-effect logic until arriving at implementable activities. Often, theories of change are visual depictions of this logic, with building blocks, or boxes, describing the inputs, outputs, outcomes, and eventual impact of activities.

Developing a theory of change jointly with a community is a necessary aspect of a community-driven conservation model. It ensures that both community and practitioner interests are considered and hence that both community development and conservation goals are addressed. A theory of change can be used to visualize the extent to which a program will transcend the boundaries of community development and conservation. By coloring community development outcome boxes in black, for instance, and coloring conservation outcome boxes in white, you can easily determine if programs are balancing benefits or are focused heavily on one side. Of course, some activities may be inherently social and others may be inherently ecological, but the program as a whole should strive for balance. This may mean discussing additional activities that address the gaps in holistic programming.

See Section "Recognizing Technical, Systemic, and Constitutive Problems in Community-Driven Conservation Initiatives" for real-world examples of how African People & Wildlife co-designs holistic programming with rural communities in Tanzania to transcend the boundaries of conservation and community development.

Implement

Implementing activities jointly with communities can be an extremely rewarding process for both the practitioner and the community members involved. To ensure that the community is invested in project success, activities should be led by community members whenever possible. Local capacity building should be an active part of every project, including the capacity of local people to lead and implement projects. Project and team management is a skill in itself; thus, it is critical for local staff members to be given the resources and mentorship they need to succeed in management roles.

Work plans for individual activities will differ substantially depending on the activity and the community context. However, some features of a work plan will remain constant. For instance, an activity timeline should be included in a work plan along with a section defining the roles and responsibilities of both practitioner and community team members. A useful example of a role definition tool is the RACI chart. A RACI chart outlines who is responsible, accountable, consulted, or informed of all activity tasks and decisions.

- *R*esponsible: The people performing the task
- *A*ccountable: The project manager or other entity (usually reporting back to donors)
- *C*onsulted: Community members or groups who may have knowledge or expertise about the activity and its implementation
- *I*nformed: Community members or groups who may be affected by the activity

To ensure that activities are community-driven and not merely tolerated by the community, practitioners should play a role of support, guidance, and advocacy. Community members should more often act as implementers, project managers, and technical leads. When done well, this model of community-driven conservation can create positive change for the environment while simultaneously developing the skills of the community. Having community members implement activities and benefit from them builds enthusiasm for joint conservation and community programs and ensures long-term sustainability of initiatives.

Verify

Early in this chapter, we discussed the challenge of balancing benefits for the community with benefits for the environment. This challenge forms the base of the question this chapter seeks to answer: how do we transcend the boundaries of community development and conservation?

The next "step" in the ACTIVE community engagement approach—verify—is critical to addressing this question. Thus far, the practitioner and the community leadership have defined shared goals, co-designed activities, and begun implementing projects aimed at providing benefits for both people and planet. But these good intentions do not inherently create balanced benefits and positive change. The logic in a theory of change must be verified as the project is implemented.

Verifying a theory of change requires routine monitoring. For communities to be genuinely invested in project success, they must see measurable change in their livelihoods and their environment. Thus, involving community members in the process of monitoring program outcomes is critical. Of course, not every building block of a theory of change can be monitored. There is too much complexity in a theory of change for most projects and not enough resources to accurately monitor all outcomes. Rather, it is helpful to focus monitoring efforts on parts of a theory of change

that are new, are innovative, or have inherent assumptions.

This is particularly important when attempting to balance community development and conservation outcomes. In many projects, the logic leading to social benefits is tried and true (e.g., income-generating activities). In other projects, the logic leading to conservation benefits is clear and measurable (e.g., demarcating protected areas). Yet when projects are intended to have balanced benefits, it is useful to test the assumptions that these benefits are accruing. For instance, an environmental enterprise program may have obvious social benefits as an income-generating activity, but the environmental benefits may be questionable. Thus, practitioners should develop indicators specifically to monitor and test the environmental effects of the program.

In the long run, being able to demonstrate the positive effects of a program for both people and planet can ensure the sustainability and scalability of that program. This makes verification through monitoring one of the most essential factors in transcending the boundaries of conservation and community development.

Evolve

Last, but certainly not least, is the process of evolving with a community. Program evolution could occur organically or be the result of decisions informed by program evaluation. Whereas regular monitoring allows practitioners and communities to test their output and outcome-level assumptions, program evaluation can provide answers to higher-level questions about program effectiveness, impact, and sustainability.

Through both monitoring and evaluation efforts, practitioners and community partners should seek to learn and adapt. Conservation and community development have ever-shifting priorities and goals. Likewise, the social and ecological aspects of an SES are always changing due to political, economic, and ecological events outside of our control. To ensure the long-term sustainability of program benefits for both people and nature, programs must be flexible, open to evaluative critique, and responsive to the changing needs of communities and the environments on which they depend.

This "step" in community engagement recalls the need for practitioners to maintain a systems thinking approach to natural resource management and be open to system-level change. This means both understanding the social-ecological systems in which we work and also recognizing how program interventions affect these systems. Interventions and their effects on an SES constitute components of another complex adaptive system (CAS). Hence, an understanding of the individual components of a CAS—for instance, understanding how an intervention works—does not imply an understanding of the whole system due to the interdisciplinary and interdependent relationships between the components.

The component of a CAS over which we have control, that is, the intervention, must be flexible and adaptable to unpredictable changes in the rest of the system. Importantly, practitioners must seek to accurately diagnose the cause of these changes or barriers to effectiveness. The next section focuses on problem diagnosis and recognizing when problems are truly technical or if they are embedded in deeper systemic and constitutive challenges.

Recognizing Technical, Systemic, and Constitutive Problems in Community-Driven Conservation Initiatives

One of the most significant barriers to transcending the boundaries of conservation and community development is the misdiagnosis of problems. There are three types of problems commonly recognized in the policy sciences (Clark and Clark 2002):

- *Technical:* focus on the ground-level logistical or ecological issues
- *Systemic:* focus on the broader governance challenges at an institutional level
- *Constitutive:* focus on the roots of the human condition based on historical, cultural, and psychological factors

For effective problem-solving in the conservation field, we must have a better method for accurate problem definition. Often, problems are misdiagnosed as technical when, in reality, there are deeper systemic and constitutive issues underpinning the technical symptoms. Without addressing these governance and cultural challenges, the technical problems will continue to surface. Addressing only the technical problems is similar to treating the symptoms of an illness but not the root cause.

To ensure the long-term sustainability of program outcomes, problems must be explored from the surface level down to the root causes. When working with rural communities in conservation, reaching to these constitutive causes can take years. Short-term projects to address technical issues must be layered with medium-term programs to address systemic challenges and long-term initiatives invested in mindset and behavior change. The following section describes African People & Wildlife's model and demonstrates how technical, systemic, and constitutive issues can be addressed simultaneously to achieve sustainable impact for communities and conservation.

African People & Wildlife Case Study

Let's explore the case study of African People & Wildlife's work in Tanzania introduced at the beginning of this chapter with a problem orientation lens.

Technical Problems

The case from the beginning of this chapter demonstrates a technical challenge that can be addressed with technical solutions. This easily identifiable technical challenge is human-wildlife conflict. This challenge is commonly discussed in village meetings, pastoralists will describe their experiences openly, and a technical solution is feasible: reduce depredation of livestock.

Since 2005, African People & Wildlife has been working closely with rural communities in Tanzania to develop a technical solution to human-wildlife conflict. In 2008, the first Living Wall was built in Loibor Siret village. A Living Wall is an environmentally friendly corral that keeps livestock safe from predators. To build a living wall, community members plant a circle of trees to serve as posts for chain-link fencing. As the trees grow, they add height to the wall and create an impenetrable barrier. As of 2019, over 1100 Living Walls have been constructed across 35 villages in northern Tanzania. Depredation at the boma has decreased by 90% in some of these villages, and retaliatory killings have subsequently plummeted (Lichtenfeld et al. 2015).

Living Walls have proved to be an effective technical solution to a technical problem. And yet Living Walls alone cannot ensure sustainable livelihoods for the people of Loibor Siret nor ensure the long-term persistence of big cat populations. There are deeper challenges at play that threaten coexistence between people and wildlife. Thus, after years of relationship building with the community of Loibor Siret, and generating trust and respect through technical problem-solving, African People & Wildlife began exploring the systemic challenges.

Systemic Problems

Systemic, or governance, challenges can be much more difficult to identify than technical challenges. Their solutions are proportionally more challenging. Yet with stakeholder analysis, in-depth discussions with communities, and a history of trust and mutual respect, practitioners can explore and seek to resolve systemic issues.

In Loibor Siret, and in many other pastoral communities, a growing population and shifting land use priorities result in limited pasture resources for both livestock and wildlife. The fragmentation and loss of habitat due to increased settlement and agricultural expansion force wildlife and humans into closer proximity, increasing opportunities for conflict. Lack of pasture resource monitoring or effective land use planning exacerbates these issues, and in turn, political conflict proliferates. At a higher level of systemic issues, pastoral communities may not have the legal tenure over their rangeland to manage it appropriately. If these issues are simply rendered as technical, human-wildlife conflict

may be addressed at the surface, but the deeper problems of habitat loss and natural resource management capacity may be ignored.

African People & Wildlife seeks to address the systemic issues at play through a sustainable natural resource monitoring and management program, which is implemented jointly between the village of Loibor Siret and the NGO. This program seeks to strengthen the existing governance structures in the village by building their capacity to make evidence-based decisions about natural resource management and land use planning. Working closely with African People & Wildlife and additional partners, community-level governance institutions implement land use plans that allow for income-generating agriculture while preserving communal pastures for both livestock and wildlife. Further, the program supports community members to monitor these pastures through a combination of indigenous knowledge and modern technology. Monitoring the rangeland health and productivity allows land use committees at the village level to use real-time data to allocate rangeland for livestock at strategic times of the year. In this way, limited pasture resources can be preserved for livestock, and vital wildlife habitat is protected.

Several other NGOs in the region focus on land tenure issues through existing legal mechanisms at a higher level of governance. By first ensuring that communities have rights over their natural resources and then assisting with the sustainable management of those resources, the systemic challenges around land use and habitat loss can be mitigated.

Constitutive Problems

Lastly, and most challenging to identify and address, are cultural or constitutive problems. These types of problems underpin all other systemic and technical challenges. They frame the way people think, behave, and relate to each other. They are the basis of people's value systems and priorities. Accurately identifying constitutive problems requires deep trust-building and ethnography and can often take years. Addressing these problems can take generations.

At the heart of most constitutive problems related to the environment is the human relationship with nature. The distinction between people and animals, developed and wild, modern and primitive, has permeated human cultures since time immemorial. Yet this dualism forms the foundation of all the environmental challenges we face today. Of course, this human-nature dichotomy has been intensified in much of the developed world and is historically the basis of the conservation field. As a result, many rural communities today, particularly those living in and around protected areas, have a mistrust of conservation work and environmental institutions. It is these constitutive challenges that must be addressed to transcend the boundaries of human development and conservation.

African People & Wildlife's organizational model is focused on addressing these constitutive problems. Just as understanding constitutive problems requires long-term and deep engagement with a community, solving these problems requires more than an individual program. It requires that an entire organizational philosophy be aimed at altering the current conservation paradigm. Thus, all of African People & Wildlife's programs follow a *community-driven* conservation model, not just a community-based model.

To begin addressing the mistrust of conservation initiatives and the imbalanced power dynamic between rural communities and environmental institutions in northern Tanzania, African People & Wildlife's headquarters is based in the village of Loibor Siret. This gives all staff, many of whom are from the community, an opportunity to personally connect with the pastoral communities living among predators, grazing their livestock on limited resources, and raising their children in coexistence with wildlife. All African People & Wildlife programs are co-designed and co-implemented with community members and leadership. And African People & Wildlife seeks to support community-driven environmental initiatives, such as watershed management or environmental enterprise, through small grants provision, capacity enhancement, and mentorship. Through this type of holistic

engagement, practitioners can begin to repair relationships with those who have suffered environmental injustices.

The even deeper-seated constitutive problem of the human-nature relationship requires a different type of engagement—the type that lasts a lifetime. Hence, African People & Wildlife focuses on mindset and behavior change programs specifically tailored to youth. With a long-term impact objective of creating a community-level conservation ethic, African People & Wildlife supports wildlife clubs in primary and secondary schools, hosts environmental summer camps, and brings students to the nearby protected area, Tarangire National Park, to instill an appreciation for the natural world that reaches beyond the fear of predators.

For decades, the conservation field has implemented education programs that focus on the value of nature and wildlife. Yet this value has often been expressed in terms of wildlife as an economic asset to the country. While this is important information to impart on rural communities, it strengthens the divide between people and nature, demonstrating how wildlife have economic value when tourists visit national parks but little inherent value outside of those government-managed protected areas. Since those protected areas are rarely accessed by local people, they are seen as areas for tourists and the wildlife within them as tourist attractions. Thus, even with people who historically have an environmental ethic (such as the Maasai), the conservation education model of the last 30 years has furthered the divide between humans and the environment.

African People & Wildlife's youth environmental education program seeks to change this model by demonstrating the non-economic value of wildlife and reinvigorating the traditional value of coexistence. For instance, environmental camp activities with youth are aimed at educating students about the ecological roles of apex predators and the top-down trophic controls they impart on the landscape. Particularly in pastoralist communities, where natural controls on wild herbivores are necessary to maintain healthy pastures for livestock, these lessons can shift the way youth view predators. Rather than wanting predators to remain in the national parks where they can only be seen by tourists, young pastoralists can grow with a greater tolerance for their presence in community rangelands and an appreciation of their ecological role. Combining this constitutive strategy with a technical one to reduce human-wildlife conflict can greatly decrease the fear of predators while rebuilding the relationship between people and nature as one of interdependence and stewardship.

African People & Wildlife's holistic approach to remedying constitutive problems includes another long-term program—scholarships. The cost of both private and government secondary school education in Tanzania can be restrictive to many rural students, especially girls, for whom education is not considered a priority. While thousands of non-profit programs exist throughout Africa to provide funding for schools and schoolchildren, rarely do these programs invest long term in the same students—instead providing one-off funding for a semester or year of schooling with no guarantee of continuity. African People & Wildlife's scholarship program, started in 2009, provides selected students with a full 6-year tuition guarantee, enough for them to graduate from secondary school. In 2017, the program also began supporting university tuition for students who wished to continue onto higher education.

This long-term investment in student's education addresses constitutive problems in several ways: (1) it instills in students a conservation ethic and understanding that humans are part of our ecosystem, breaking down the human-nature dualism from a young age; (2) it supports continuity in education for girls, thereby counteracting deep-seated societal biases which threaten women's empowerment; (3) it does not restrict beneficiary students to higher education in an environmental field (i.e., one of African People & Wildlife's university scholars recently graduated from medical school), ensuring that future leaders in different disciplines have a strong foundation in environmental management; and (4) it provides an environmentally non-consumptive alternative to lion spearing as

a method of gaining social status for young men (i.e., completing secondary school is a significant achievement for Maasai and can fulfill young men's desire for higher social status).

Jointly, African People & Wildlife's youth environmental education program and general philosophy of community-driven conservation work to address constitutive problems in rural communities in Tanzania. This model can be adopted by other practitioners around the globe and adapted to fit their community context. By not rendering all problems technical and instead actively seeking to address the root constitutive challenges in a system, practitioners can begin to transcend the boundaries of community development and conservation.

Conclusion

In this chapter, we have discussed social-ecological systems theory, explored how that theory can be put into practice, and provided real-world examples of practitioners effecting positive change. From recognizing the elements in a system to accurately diagnosing problem types, conservation practitioners must maintain a holistic SES mindset. All three types of problems—technical, systemic, and constitutive—must be addressed in all components of an SES to achieve lasting change.

Of course, conservation practitioners alone cannot realistically accomplish this. Here we make a case for interdisciplinary programming based on strong partnerships between scientists and practitioners in conservation, health, economics, ecology, development, and education. Sustainable, equitable results require a system overhaul. Human and environmental well-being are so intimately linked that no development program should be without a conservation element and no conservation program can succeed in the long term without embracing the values of environmental justice for impacted people. To truly shift the conventional paradigm of human-nature dualism to one of integrated human and environmental welfare, both a conservation ethic and a human dignity approach to programs must be instilled in all aspects of society.

We have reason to hope. Poverty and hunger have decreased significantly in the past few decades, and environmental enterprises around the globe are bringing new economic opportunities to rural communities. Innovative technological solutions to mitigate climate change are being implemented in some of the most developed countries in the world, while traditional natural resource management practices are making their way into the national policies of many developing countries.

Scenario 2

Consider a hypothetical SES in a primarily pastoralist buffer zone of a protected area which houses high-profile predator species. Due to the innovation of local women's groups, thousands of beehives have been hung in trees growing in degraded communal pastures. Since the protected area is so close, the region has a significant tourism industry. Environmentally conscious tourists seek out markets to purchase locally produced honey and share ideas with the women's groups about the environmental enterprises in their home countries. The local business expands to produce other honey products, and the women's groups hang more beehives in degraded pastures. As bees colonize the hives in these pastures, they pollinate native species, and the grasslands begin to regenerate. Pastoralists monitoring the pasture health notice the improvement and provide evidence to the local government of the successful restoration techniques. The government committees responsible for land use planning make evidence-based decisions about land allocation. As pastures regenerate, pastoralists feel confident in their livelihoods and teach their children about their cultural value of environmental stewardship. The children grow to respect the importance of predators in an ecosystem

(continued)

and take measures like building living walls to protect their livestock from depredation. Some of these youth grow to become leaders in the community, while others attend school to become the future managers of their nearby protected area.

The system described in scenario 2 may be hypothetical, but it does not have to be. It represents real events and interactions that can occur in social-ecological systems around the globe—so long as we support them.

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