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Living in an Elephant Landscape: The local communities most affected by wildlife conservation often have little say in how it is carried out, even when policy incentives are intended to encourage their support

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In July of 2016, a group of farmers and livestock keepers, mostly from the Subiya ethnic group, met with us in their open-walled community hall in Kavimba, a small village in northern Botswana. The community sits on a shifting, narrow strip of land at the edge of a wilderness. Houses and community lands are sandwiched between two protected areas--Chobe National Park and Chobe Forest Reserve--and the floodplain of the coursing Chobe River, within sight of the Namibian border across the wide wetland. A Kavimba councilman spoke up to explain the livelihood challenges that increasingly affected his community.

"Years ago, a Subiya man needed only a mokoro (dugout canoe), net, plough, sledge, spear, and yoke. Nothing else," he said. But those times were very different. Last year, many people did not bother to plant their fields. The risk of elephants eating the crops (mostly maize) before harvest was too great. Many people now subsisted on pensions and subsidies from the government of Botswana. Community-based conservation arrangements had created a few jobs and a small stream of revenue from safari tourism, which are intended to attenuate these problems. However, these were having little positive effect on their livelihoods.

The councilman and a handful of other residents were speaking with us, a group of ecologists and geographers from the United States and Botswana conducting research in the region, to share their experiences with changing climate. The meeting quickly shifted topics to a recent hunting ban and the ways that elephants affected residents' daily lives.

Botswana had placed an indefinite moratorium on hunting, including for trophy elephants, which had taken effect in 2014. Although the hunting ban was made in the context of global conservation concerns and was motivated by declines in many species of wildlife, the removal of legal hunting significantly reduced the revenue stream from wildlife tourism to communities such as Kavimba. Despite their membership in the Chobe Enclave Conservation Trust, residents in this area did not feel that their interests had been represented, or that they had had a say in the policy decision.

For the majority of Chobe residents whose livelihoods had shifted in recent years to depend on a commercial tourism economy, the hunting ban was abrupt and was implemented without their knowledge or consent. The residents sitting in our meeting described a lack of jobs in the tourism sector, while they perceived a recent, unmitigated rise in elephant conflicts that undermined their livelihoods. In their view, the benefits from hunting that were supposed to mitigate crop raiding and other livelihood costs had abruptly been taken away.

The shift in conversation away from climate was not surprising, given the significant effect of the high and rising elephant numbers on the local landscape. The Chobe Enclave sits between the river, an important water source during the dry season, and protected areas used by elephants during the wet season, the Chobe Forest Reserve and the Chobe National Park, which protect one of the largest elephant populations remaining on the planet. On the tarmac road that bisects the northeastern strip of the Chobe Enclave, drivers pass trees broken off at the trunk along the escarpment, their canopies removed and their branches lying on the ground, a consequence of heavy elephant browsing.

On the opposite side of the tarmac, toward the Chobe River, fallow floodplain crop fields are barricaded with barbed wire, metal panels, and scrap material. Fences are strewn with strips of plastic and cloth put there to flap in the wind as elephant deterrents. Sections of road are scattered with dung, marking crossings where elephants move from the upland forest to the floodplain and its perennial sources of water and forage, their paths taking them through farmers' fields and grazing lands. The livelihoods of Kavimba residents are clearly shaped by elephants and are far removed from the life described by the Subiya councilman.

The empty fields and more obvious signs of elephants illustrate that conservation concerns in the Chobe Enclave are paramount. The current efforts at balancing trade-offs between people and wildlife are not working. Similar conflicts have persisted for decades, and this problem is not uncommon in Africa.

The Chobe Enclave Conservation Trust was born out of pioneering community-based conservation efforts in the late 1980s and early 1990s in sub-Saharan Africa; the goal was to decentralize management of natural resources. The community-based conservation model is premised on the assumption that if communities are given formal rights to manage land and resources--including the rights and ability to profit from wildlife and nature conservation--then more locals will support conservation as a means of improving their livelihoods. Community-based conservation programs were introduced in part to offset the costs of living adjacent to national parks, game reserves, and other areas protected for wildlife. Those costs include wildlife eating crops and livestock, wildlife harming people, loss of land, restricted resource access, and, in some cases, even forced eviction.

Community-based conservation programs were first established in Botswana in 1995 (through community conservation trusts). Similar programs were created in neighboring countries: conservancies in Namibia, the Administrative Management Design (ADMAD) Programme in Zambia, and the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) in Zimbabwe. They were founded through partnerships between communities and state governments, with major support from the U.S. Agency for International Development and international conservation organizations. In each of these countries, the respective programs have, at times, been successful. Success of transferring revenue to communities depends on profitable wildlife tourism, primarily trophy hunting and photo safaris.

In contrast to the ideals of these programs, living conditions for people in the Chobe Enclave have declined in recent years. The Enclave is remote and yet constrained, bounded by wildlife conservation areas to the south and east, and by the floodplain and Namibian border to the north and west (see the maps on pages 36 and 38). Human population growth contributes to land shortages. Distant government offices control the allocation of land, particularly for commercial use. For example, any land deemed to have tourism potential is currently overseen by the centralized Botswana Tourism Organization. Lack of easy market access to the nearest town, Kasane, acts as a barrier to commercial harvest of natural resources such as grasses and reeds, and to the sale of value-added products such as baskets and mats. Due to the presence of foot-and-mouth disease in the region, nonlocal sale of livestock is prohibited, which severely limits the economic return on grazing cattle. Through our ongoing study, we estimate the level of unemployment to be 90 percent. Most household cash comes from family remittances or government subsidies and poverty-relief programs.

The success of the community-based conservation model is debated among scientists, practitioners of conservation and development, and policy makers. The policy-specific criticisms include the following claims: that participating communities never actually gain rights to manage their resources and consequently struggle to implement effective conservation; that the majority of wildlife revenue is often retained by state authorities; and that benefits that do accrue locally are unequally distributed and insufficient to offset the significant costs of living amid wildlife. These are not new criticisms, but there is still a need to argue for a stronger role of communities within the national and international conservation agenda.

The situation in Chobe Enclave demonstrates the complexity of balancing national and global policy interests against the livelihood and decision-making needs at the community level. There is no one-size-fits-all approach to wildlife conservation and economic development. For the Subiya and others in communities like theirs, centralized policy-making and the promotion of wildlife are a dual threat to their livelihood security. The ongoing changes in climate and in resource availability suggest that there is a mounting need to resolve conflicts with wildlife and the more fundamental conflicts between communities and conservation goals. However, the Chobe Enclave is a case study in which long-term experience has failed to transform useful lessons into better livelihoods for people. Our work in this region highlights missed opportunities in conservation policy to acknowledge and respond to the real-life consequences that locals incur from protected wildlife. Restructuring policy to include representation of Chobe residents could make community conservation in this region again a model for others to follow.

Policy Changes for Conservation

While rural communities struggle to live with elephants, the massive scale of elephant poaching across Africa and of the global ivory trade in recent years has garnered attention and outcry from the scientific community, the international public, and national governments. Across the continent, African elephant populations have declined by as much as 60 percent since 2007, falling to approximately 400,000, largely because of poaching to meet consumer demand for ivory in China and Southeast Asia. Globally, illegal wildlife trade is estimated to total \$10 billion to \$23 billion in U.S. dollars.

Halting the legal sale and trade of ivory is viewed as a powerful policy instrument to combat poaching, as evidenced by two decisions in late 2016 from the International Union for the Conservation of Nature and the Convention on the International Trade of Endangered Species to ban domestic ivory trade in signatory nations, and also by China's State Council announcement to make domestic ivory trade and processing illegal by the end of 2017.

But the situation is complicated. Following the 2014 suspension of all imports of elephant trophies, the United States is currently struggling with resolving conservation and trophy hunting interests. While elephant populations have plummeted across many regions in Africa, Botswana's elephants have remained relatively protected. The nation is home to one-third to one-half of Africa's remaining savanna elephants, so it plays a key role in conservation of the species. The 2014 hunting moratorium in Botswana sacrificed significant state and community revenue from trophy hunting, and community-based conservation communities were entirely excluded from that policy decision. Although the decision was in part enacted in response to population declines in many species, the inclusion in the moratorium of elephants, whose population was increasing locally, reflected the global imperative to support their conservation.

At our meeting in Kavimba, the councilman described how the livelihoods of the Subiya and other residents had changed under community-based conservation, and how they now faced another change under Botswana's hunting moratorium. Over the 23-year history of the Chobe Enclave Conservation Trust, human and elephant population growth had led to increasing constraints on the use of natural resources. The Trust promoted trophy hunting and other wildlife-based tourism to generate revenue and jobs for the member communities. At the same time, under the Trust's management plan, individual rights to harvest wildlife and other natural resources were limited to ensure sustainable use and preservation of wildlife habitat. The result was a shift from traditional natural resource-based livelihoods to a more cash-based economy.

From 2011 to 2013, trophy hunting generated US\$420,000 annually for the Trust, representing about 70 percent of their revenue stream. At the same time that the Subiya people and their neighbors continue to bear conservation costs, the removal of trophy hunting revenue without the replacement of rights to traditional use of natural resources means that community benefits from wildlife have been greatly reduced and that local support for wildlife conservation has been strongly undermined. Indeed, the moratorium calls into question whether communities ever controlled the rights to their lands and resources, which is a long-standing criticism of community-based conservation strategy globally.

Livelihoods in the Elephant Landscape

In the absence of centralized national policies controlling land and resource rights, the Subiya were historically dependent on resources from the floodplain landscape and on small-scale farming. Traditional homes were built of mud and roofed with thatch found in the floodplain. Household compounds were walled with reeds, and sleeping mats were woven from spongy papyrus stems. As the councilman described, the mokoro canoe allowed wet-season access to the floodplains and river channels for resource gathering, such as fishing and harvesting wild food. The ox-drawn sledge, built from the fork of a large tree, provided dryland transport in the sandy upland and the means to transport timber, firewood, and harvested crops.

In the floodplain fields, people cultivated maize, sorghum, and millet intercropped with beans, pumpkins, and melons. Households kept livestock, although herding has been far more central to the livelihoods of non-Subiya groups such as the Tswana. For all people in the region, livelihood strategies were flexibly implemented based on the highly variable ecosystem dynamics associated with the flood pulse of the Linyanti and Chobe Rivers.

Today, most rural households in northern Botswana still use the floodplain for many things--for example, to supplement their diets, graze livestock, and gather thatch and mud for their homes. But their access to these resources is now constrained, which further limits their ability to adapt to economic or environmental changes.

Because elephants have become so numerous in recent years as a result of successful antipoaching efforts and in-migration from areas of extreme poaching pressure, farmers have experienced heavy losses from crop raiding and destruction of fences and fields. They have also faced the constant threat of losing livestock to lions and other predators. These costs of living with wildlife severely affect already vulnerable livelihoods.

Residents in the Chobe Enclave secure few jobs in safari lodges, and the Trust receives limited shared revenue from contracts with lodges, guiding operators, or other tourism endeavors. Generally, where trophy hunting is legal, it can provide a greater source of revenue than photo tourism, while also diversifying the community's income stream. Community-based conservation communities earn either a flat concession fee or a percentage of game license and tag fees, both of which are controlled or overseen by central wildlife agencies. In many cases, a market exists for hunting in areas unsuitable for photo tourism--for example, in areas of thick bush and incessant tsetse flies; hunting can then operate simultaneously with photo tourism.

The challenges and successes of community-based conservation vary widely for a variety of reasons: differences in local-level governance and management with regard to matters such as the use of revenue; ecology and geography; policy arrangements; foreign economies; and the international tourism market. This variation is demonstrated across one of the world's largest networks of parks and protected lands, spanning five nations in southern Africa, called the Kavango-Zambezi Transfrontier Conservation Area (KAZA).

Competing Needs in a Dry Land

KAZA was announced in 2006, when an agreement among the leaders of Angola, Botswana, Namibia, Zambia, and Zimbabwe agreed to sustainably manage the large wetland and savanna ecosystem for conservation, tourism, and community well-being. Seventeen national parks, along with numerous other protected areas, including those under community-based conservation, sit within the boundaries of KAZA, spanning an area larger than the state of California. The Chobe Enclave, including Kavimba, is part of this larger area, which makes KAZA's governing body, the KAZA Secretariat, well poised to act as a liaison between local, national, and global entities.

In the past decade, Botswana, at the core of the KAZA landscape, has become a stronghold against the global rise in poaching for ivory. As elephant populations decline precipitously across Africa, their numbers in KAZA and in Botswana specifically are stable or increasing.

KAZA breathes its elephants with the seasons. The roughly 150,000 individuals in Botswana move through fields, among protected areas, and across national borders between the three perennial water sources (Okavango/Cubango, Kwandu, and Zambezi) during the dry- to wet-season cycle. From one year to the next, elephant populations can fluctuate dramatically as well, often in response to human-caused changes. Elephants were nearly wiped out from the KAZA region during the Angolan civil war and ensuing Namibian struggle for independence. Less than 30 years later, elephants have returned en masse to the stability of KAZA as poaching has increased in surrounding regions.

Each KAZA nation must try to manage variable, mobile elephant populations across a range of different land-use conditions. Management budgets are small, typical of those for many government agencies in nations of sub-Saharan Africa. Not only must management activities be flexible and responsive to population and environmental changes, they must also balance the two sides of the KAZA mission: sustainable ecosystem management and human wellbeing. Achieving this balance is particularly challenging in the dry season, when wildlife habitat most overlaps with the farmlands and settlements of rural communities near water sources.

Making management even more challenging, KAZA's mission includes coordination across national borders and with communities on the ground. Although Botswana plays a key role because of its stake in protecting its exceptional wildlife populations, KAZA management is a joint venture that includes the other five member nations. Each KAZA partner weighs both conservation and development needs; this balancing act is the primary motivation behind the landscape-level collaboration. Importantly, KAZA's governance structures cannot make binding policy prescriptions; decisions must come from member nations.

Wildlife-based tourism sectors in each of the KAZA nations differ, influenced by factors such as political stability and economic priorities. Nevertheless, the commitment to conservation by all KAZA partners remains strong. Recently, the issue of whether to limit or ban trophy hunting within KAZA has been debated. On one side, hunting generates revenue, which supports tourism economies and cash-strapped government agencies charged with managing land and wildlife. Hunted wildlife populations can be healthy and sustainable, yet overhunting and the effects of killing only dominant individuals are persistent and wide-ranging problems.

On the other side, there are preservationist arguments against hunting vulnerable species, and ethics often influences opinions of acceptable uses of wildlife. As the president of Botswana, Ian Khama, said in his 2013 State of the Nation address: "The shooting of wild game purely for sport and trophies is no longer compatible with our commitment to preserve local fauna as a national treasure, which should be treated as such."

People on both sides of the hunting debate recognize the importance of tourism for KAZA. And most recognize that sustainability in an increasingly isolated or closed ecosystem may require population management to control growth in certain species. Unchecked population growth in elephants can lead to negative consequences for the landscape, catastrophic die-offs, or the need for culling of animals. Well-managed hunting can be an effective tool for keeping populations in check.

An important consequence of the hunting moratorium in Botswana is that it has revealed community-based conservation to be an economic bargain that exists between communities and the nation. Communities do not possess actual rights and control over resources; rather, they endure the costs of living with wildlife in exchange for a portion of wildlife revenue. And in many cases, the right to negotiate the terms of this bargain or even knowledge of its existence escapes the people affected most by conservation.

As the Subiya councilman pointed out, giving up individual rights to hunting and other resource use as part of their livelihoods was more acceptable when these strategies could be replaced by revenue from trophy hunting. In 2014, the Trust's revenue was nearly halved, falling from US\$650,000 to US\$330,000 with the closure of hunting in its areas. The higher revenues that the Trust had received over the previous 20 years had helped to increase tolerance for elephant damage among its communities.

Yet the central issues may be agency and representative forms of management of natural resources, rather than revenue. For example, across the Chobe River in Namibia, another long-running community-based conservation institution, Mashi Conservancy, dispenses only 100 Namibian dollars per adult per year, equal to less than US\$8. Mashi uses hunting and tourism revenue to fund these small payments, along with community projects such as scholarships and health services. In a 2017 survey of Mashi households, we found that nearly all residents self-identify as active community-based conservation members. Conversely, in the Chobe Enclave, four years after the cessation of Botswana hunting revenue, less than 1 percent of households identify themselves as members, although the Trust's constitution defines membership as universal among adult residents of the five Chobe Enclave communities.

These challenges are not unique to the Enclave and KAZA. They exist throughout sub-Saharan Africa and across the tropics, where conservation strategies attempt to balance the needs of people and wildlife. Providing sufficient revenue for households to practice sustainable livelihoods may be too great a challenge for conservation strategies alone. However, the KAZA Secretariat can positively affect communities by better linking global support for conservation to communities on the ground, while rallying member nations to incorporate communities more directly into the policy process affecting local lands.

Connecting KAZA to Communities

KAZA is an important global model for conservation. It faces universal challenges while also demonstrating partnership among nations and stakeholders. The KAZA Secretariat coordinates national policy around protected area management and has marshaled significant backing from conservation organizations and other multilateral donors. The global poaching crisis has put the spotlight on KAZA and its member nations. This situation presents an opportunity for the Secretariat to advocate among its diverse conservation supporters to include the costs to local communities in the price tag of preserving elephants and other species in the landscape.

Acting on this opportunity will not be easy. The levels of funding required to offset the costs to communities of wildlife conflict and restricted resource access are steep and outside the scope of existing social programs of KAZA member nations (such as subsidized labor or rural development programs). However, the recent rise in global support for elephant conservation could leverage increased donor contributions from multilateral organizations and agencies, and from the global public. KAZA should act as a boundary organization, channeling increased financial support to the trusts and conservancies that share land with the world's largest remaining elephant population. Programs to remunerate people for financial losses due to wildlife, to support and subsidize employment in tourism-related sectors, and to compensate for food and resource shortfalls may not lift communities out of poverty, but they may reduce the livelihood uncertainty that is inherent in this landscape and that is made more acute by conservation. Current efforts are insufficient.

Even if financial support is increased to a sufficient level, which would be no small achievement, the problem of disempowerment will remain. Tourism jobs and well-funded government subsidy programs could constitute an adequate economic bar-, gain, paying people for the costs of wildlife. However, without collective choice arrangements and decision-making authority over lands and resources, the Subiya and other community members across KAZA would be living in a conservation welfare state. To achieve the human well-being half of its mission, the KAZA Secretariat must go beyond promoting tourism as a silver bullet. It is well-positioned to lobby its member nations to institute greater local decision-making authority over community lands.

Successful examples of community-based resource management exist across the globe. Central features of these institutions include local decision-making authority and locally captured benefits. Such successes, however, are more common in the Global North, Latin America, and Asia, and in cases of forest conservation. In Africa, cases of successful community management of wildlife have been few and short-lived.

KAZA and its member nations still serve as a positive example of conservation leadership. Current policies include the implementation of spatial landscape management. This strategy attempts to reallocate land use to reduce human-wildlife conflict. Elephant corridors through community lands are identified, and settlements and farms within these zones are relocated. Ideally, spatial management would better account for seasonality of wildlife habitat and human resource use, and would potentially allow wildlife and humans to use areas at different times of year. Current steps toward implementing the strategy are under way, both in the Chobe Enclave and elsewhere. But effective planning comes at high cost, and the role of communities in new land policies is as yet unclear.

Regardless of the pathway forward, the Subiya livelihood described by the councilman is unlikely to be restored while KAZA still effectively protects one of the most important remaining elephant populations. Human population growth and resource demands require that some lands remain strictly protected for wildlife. Nevertheless, residents in the Chobe Enclave should retain certain rights to natural resource access in the floodplain and upland forest, and they should be better integrated into the policy process that grants and limits these rights within national land-use management. To accomplish this, the KAZA Secretariat could lobby its member countries' governments to transfer some aspects of land-use and conservation decision-making to rural communities. Further, the Secretariat could formalize institutional mechanisms that include local voices and allow the active participation of member households in management planning that will directly affect their livelihoods. Facilitating this integration will ensure that the Secretariat acts on the mission of sustainably managing the well-being of the community and of the ecoregion as a whole.

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Caption: A bull elephant crosses the tarmac road near the Chobe Enclave Conservation Trust in Botswana in 2017. Elephant browsing changes landscapes and can destroy crops. In places where conservation of elephants has been successful, locals must shift their livelihoods to accommodate the wild animals. (Photographs courtesy of the authors, unless otherwise noted.)

Caption: The Kavango-Zambezi Transfrontier Conservation Area (KAZA) spans an area larger than the state of California and includes 17 national parks, along with numerous other protected areas, within five countries. Elephant numbers in KAZA are stable or increasing, making it a stronghold against the global rise in poaching. (Elephant population numbers from elephantdatabase.org.)

Caption: Elephants move from areas of wet-season forage to dry-season water sources, such as the Okavango Delta shown here.

Caption: A resident of Mashi Conservancy in Namibia stands with his ox-drawn sledge, with homes in the background that are built with mud and thatch from the floodplain. The livelihoods of people in Mashi and the Chobe Enclave, which both fall within KAZA's borders, have changed as they have had to share land with elephants.

Caption: The Subiya and other residents use a traditional dugout canoe called a mokoro to access resources in rivers and wetlands. Access to these resources can be limited by wildlife conservation.

Caption: As Botswana's elephant population has grown, the Chobe Enclave has been especially affected. During the dry season, elephants cross the Enclave from Chobe National Park and Chobe Forest Reserve to get to the river, which swells with floodwaters at that time of year from the previous months of rain upstream in the headwaters. Balancing sustainable ecosystem management and the socioeconomic well-being of the people in the elephants' path has become a challenge.

Caption: Tourists on a photo safari watch elephants swim across the Chobe River in Botswana. Community-based conservation arrangements rely on photo tourism and trophy hunting to offset the costs locals incur from living with elephants and other protected wildlife. Botswana's 2013 hunting moratorium significantly reduced revenue generated for communities.

Caption: Elephants have a marked effect on the landscapes where they live, as evidenced by the heavily browsed foliage in the image above.

Caption: When crossing through farmland along the river to get to the wetlands during the dry season, elephants can cause crop damage like that seen in this field of maize in the Chobe Enclave.

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