

Shall We Gather 'round the CAMPFIRE?

ZIMBABWE'S APPROACH TO CONSERVING INDIGENOUS WILDLIFE

Carolyn Fischer, Edwin Muchapondwa, and Thomas Sterner

When the bald eagle, revered symbol of the United States, was threatened with extinction 40 years ago, the problem turned out to be relatively easy to solve. The greatest threat came from a widely used pesticide, DDT, which interfered with the bird's ability to reproduce by weakening the shells for its eggs, causing them to break during incubation or fail to hatch. It was banned in 1972 and bald eagle numbers have risen steadily ever since.

But for the great animals of the African plains currently facing extinction, the remedies are hardly so clear-cut. The reasons why, however, are not: habitat loss and poaching have taken their toll for decades, despite regulations, bans, and treaties. Recent conservation efforts have focused not only on enforcement of trade restrictions, such as bans on ivory, but also on mitigating the economic consequences of human-wildlife conflicts. In particular, major international and non-governmental conservation organizations are supporting initiatives to promote and share the economic benefits of wildlife conservation with local communities. Some examples in East Africa include channeling commercial forest product royalties and forest-based tourism fees from Mount Kenya Forest to the community level; assistance with marketing activities to help sell natural woodland products in Kibwezi, Kenya; and a voluntary levy by outfitters of 10 percent of trophy fees on tourist hunting in the Serengeti, Tanzania, with the revenues directed to the villages on whose land they operate.

At first glance, profit sharing, by making wildlife a valuable resource, seems sure to encourage wildlife conservation and

benefit poor rural communities. But wildlife management problems in developing countries are rife with complicated questions of governance and human conditions, not to mention biological processes. An important policy question is how the design of benefit-sharing initiatives might affect both wildlife and community welfare.

Zimbabwe offers an interesting case study. The establishment of national parks, game reserves, and safari areas in the late 1920s may have helped avert biodiversity loss, but it also displaced rural communities from land that was traditionally theirs. Cultivation and grazing land was expropriated, and subsistence hunting became illegal. Wildlife from the parks roamed freely in surrounding areas, destroying crops and threatening livestock and people.

To make matters worse, more than 90 percent of communal land in Zimbabwe is located within agriculturally marginal regions plagued by persistent drought and poor soil. So people relying on parklands to graze livestock suffer doubly by the creation of wildlife parks.

The Department of National Parks and Wildlife Management has owned the wildlife in trust for the country and originally reaped all the benefits—by selling licenses for hunting and charging fees for wildlife services, like tourism. Hunting is ordinarily forbidden in national parks, but the country has 17 safari areas—comprising 1,892,724 hectares—that allow limited hunting. Illegal poaching grew problematic, and since wildlife posed a nuisance, locals would often turn a blind eye or even collaborate with poachers.

In 1989, Zimbabwe instituted a wildlife benefit-sharing program, the Communal Areas Management Programme for

Indigenous Resources (CAMPFIRE). It focuses on communal areas adjacent to national parks, where wildlife intrusion is most severe. CAMPFIRE gives communities co-ownership of natural resources, which generate income through trophy hunting concessions, natural resources harvesting, tourism, live animal sales, and raising animals for meat.

ANTIPOACHING EFFORTS IN ZIMBABWE

Most of the economic value of wildlife throughout much of Africa comes from poaching. In Zimbabwe, local communities themselves engage in small-scale subsistence poaching, mainly for small game such as spring-hare, bushbuck, and guinea fowl. Poaching for the pot has often been overlooked by the park agency, which finds it difficult to enforce the law in any case.

Commercial poaching, on the other hand, mainly targets larger game for trophy sales and is usually carried out by professionals with automatic weapons. The ultimate customers are international and wealthy. Poachers usually hire a few local informers and accomplices; however, little income from commercial poaching actually reaches the local community.

Under the 1982 Parks and Wildlife Act, authority over wildlife resources devolved to democratically elected rural district councils. The CAMPFIRE program was created to integrate the local communities into decisions about wildlife conservation and give them shares of the benefits. Absent such benefits, the local communities consider wildlife, particularly large game, to be a nuisance and tolerate poaching. Once they were integrated into the process, local communities began to perceive game as a resource and frown on activities that harm it. This change in local norms along with peer enforcement alienates accomplices and makes poaching more difficult for the outsiders.

Poaching was rampant prior to CAMPFIRE but has since been drastically reduced in some areas, as the neighboring communities started reaping economic benefits from legal use of wildlife and making public arrests of commercial poachers. However, in other areas, poaching subsided only temporarily. Unfortunately, since controversial land reform began in 2000, CAMPFIRE has fallen into disarray.

BUILDING A MODEL TO STUDY POACHING

To understand both the successes and the shortcomings of the program, we have analyzed how community income and conservation incentives respond to resource profit sharing in a typical rural area in Zimbabwe where wildlife is abundant (though our analysis is relevant to wildlife revenue-shar-

ing programs in general). We employed a bioeconomic model to study poaching by outsiders, antipoaching efforts of local communities, and interactions between park managers, the communities, and the poachers. Our model has two agents, the park agency and a local community; two control variables, hunting quotas and antipoaching efforts; and a stock variable representing wildlife. The revenue from wildlife conservation—from hunting licenses and tourism fees—may be shared between the park agency and the local community; agricultural production solely benefits the community. Income from agriculture is negatively affected by larger wildlife stocks, which graze and trample crops.

The local community receives a hunting quota and consequently a share of the hunting profits. It may also get a share of the profits from tourism fees. The remaining profit goes to the park agency. Revenue from both consumptive (hunting) and nonconsumptive (tourism) uses will increase with the stock of wildlife.

The community can engage in antipoaching activities—discouraging accomplices, monitoring and protecting wildlife, reporting poachers and informants, and employing antipoaching units—and can also collaborate with poachers. Engaging in antipoaching efforts entails costs, such as the value of time lost and wages for private enforcement agents.

MODEL RESULTS: PROPERTY RIGHTS AND CONSERVATION INCENTIVES

How does the reallocation of the benefits from wildlife resources affect a community's incentives for conservation?

The community knows that the allocation of hunting licenses may be influenced by the strength of wildlife stock, which the community, in turn, can influence through antipoaching efforts. With profit sharing, the local community can augment its income from agriculture with profit shares from hunting and tourism, less the costs of antipoaching activities. Naturally, the community will engage in active antipoaching efforts if more wildlife benefits them, and it will collaborate with poachers if wildlife is a nuisance. Note that the community does not directly choose harvesting levels; rather, it influences the offtake (hunting plus poaching) through how it responds to poaching.

Given this indirect influence on the wildlife stock—and the revenues it generates—how should we expect conservation incentives to respond to the allocation of the benefits from the two sources of wildlife profits, hunting and tourism? More wildlife generates more tourism, so raising the community's tourism shares always improves incentives for conservation and antipoaching efforts—or at least it makes

wildlife less of a nuisance on balance and reduces incentives to collaborate with poachers. However, raising hunting quota shares increases conservation incentives only if having more wildlife generates more quotas. Therefore, an important question is the extent to which the community thinks that its efforts will result in an increase in quotas, which are set by the park agency.

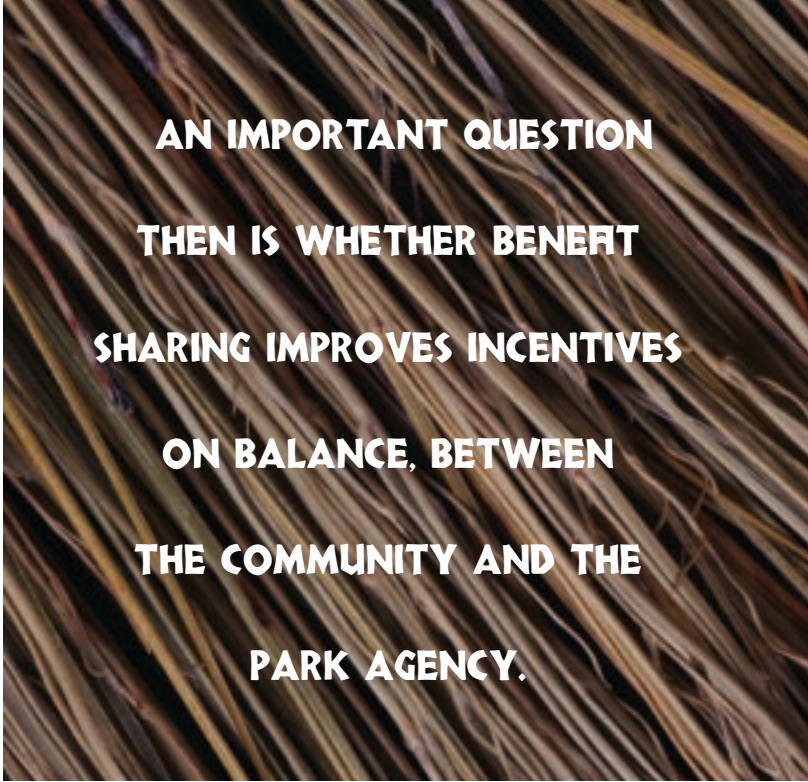
Less poaching does not necessarily mean more hunting quotas because the number of quotas depends both on population growth rates and on the park agency's response. If the community has little faith that the park agency will raise quotas, its incentives will be considerably weakened. In the extreme case—if the community believes the quota allocation to be fixed—increased hunting shares will yield a lump-sum increase in income, with no impact on conservation incentives.

Next we explore the effect of how the hunting quotas are determined. Taking the extremes, we first assume that the park agency bases its decision on biology alone, then see what happens if the park agency seeks to maximize its own profits.

Under a biologically determined decision rule, the park agency determines a sustainable harvest. When the wildlife population increases, the park agency accordingly can afford to raise the hunting quotas. In this scenario, an increase in the share of hunting revenues increases antipoaching efforts, since communities know additional quota revenues will be forthcoming.

However, conservation incentives do not go hand-in-hand with the responsiveness of the park agency. When communities perceive wildlife to be a nuisance, the park agency's response of granting additional hunting licenses when there is less poaching generates two benefits: it raises revenues for the community and reduces nuisance wildlife. Conversely, when communities want more wildlife (and the tourism revenue it generates), the responsiveness of the park agency can raise or lower antipoaching efforts. On the one hand, the community receives additional revenue; on the other hand, additional quotas reduce the stock of wildlife that now has a net positive value to the community. In other words, the quota increase can dampen community efforts.

Now let's say that the park agency is out to maximize profits. In this case, the park agency's concern for conservation depends on its own share of the benefits. It is more concerned with conservation—and less willing to allocate hunting licenses—the higher the marginal return to tourism and the lower the marginal return to hunting, after profit sharing. As a result, changing the relative hunting and tourism revenue shares can change the manager's incentive for setting quotas.



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An important question then is whether benefit sharing improves incentives on balance, between the community and the park agency. For example, if the park agency retained all the hunting profits while the communities reaped all the tourism revenue, any decrease in poaching would merely be offset by additional hunting licenses. If the community recognizes this response, it would have little incentive to engage in antipoaching efforts. Consequently, wildlife stocks would become more depleted under this kind of profit sharing, benefiting communities by fewer wildlife conflicts rather than by large tourism revenues.

Suppose instead the park agency reaped all the tourism revenue while the community received the hunting quotas. In this case, the park agency would want to keep the wildlife stock as large as possible and would refrain from issuing hunting licenses. Communities would then be worse off: not only would they receive little or no hunting revenue, but they would suffer more wildlife incursions.

More generally, when the park agency controls the target wildlife stock through hunting quotas, the community can only influence the portion of the total offtake that is harvested through hunting rather than poaching. When the community receives a share of the hunting quotas, it combats poaching to secure a share of those licenses for itself, not to manage the wildlife stock. Tourism benefits, however, have no effect.

In Zimbabwe, tourism revenues from CAMPFIRE have been small compared with hunting revenues. However, if the incentive from tourism shares is sufficiently strong—as perhaps it could be in Kenya and other countries with more wildlife

tourism—the community may engage in less effort, recognizing that on the margin it affects only hunting licenses rather than the wildlife stock.

CONCLUSION

The CAMPFIRE program in Zimbabwe directed shares of the profits from hunting and benign tourism toward the local community, in part to offer direct compensation for the nuisance suffered from wildlife and in part to induce antipoaching effort. In many respects, CAMPFIRE seemed successful, at least initially. Poaching, seen as rampant before the program, fell drastically afterward, with evidence of community help. However, in some areas poaching subsided only temporarily, and the situation deteriorated again when communities did not receive the promised benefits and rural district councils did not generate enough money to support the antipoaching units.

Mere resource sharing does not automatically confer benefits and conservation incentives on local communities, according to our analysis. Those incentives depend critically on the type of resource activity that generates the shared profits, the extent to which these shared profits outweigh agricultural losses, and also how profit sharing and community responses affect the resource management practices of the park agency.

Our findings reveal the importance of the park agency's management strategy and its interaction with the community. If less poaching merely translates into more licenses—and the community knows this—the incentives to resist poaching then derive primarily from the hunting revenues. If, on the other hand, additional licenses do not completely crowd out reductions in poaching, the community will expend more effort against poaching (or at least collaborate less) to the extent that it receives more revenues from tourism.

When the community does not expect the park agency to change its allocation of hunting quotas, additional efforts to promote tourism through more conservation can be tempered after a while—or even undone completely—if the agency does not itself have enough incentive to protect the wildlife stock for tourism. The consequences have been felt in recent years, as political instability has hobbled the tourism industry; reports of rampant hunting and poaching on game parks seized as part of the land reform evoke little surprise.

Recent troubles aside, the experience of CAMPFIRE in the 1990s was largely positive, although the success was fragile. The details of program design are important: one of CAMP-

FIRE's major benefits may be that it showed how a resource management program involved local people not only in benefit sharing but also in decisionmaking. If allowed to evolve, these kinds of institutions could open up avenues for correcting problems in the design of wildlife conservation programs and ensuring that the application of benefit sharing lives up to its laudable intentions. ■

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For more information

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