

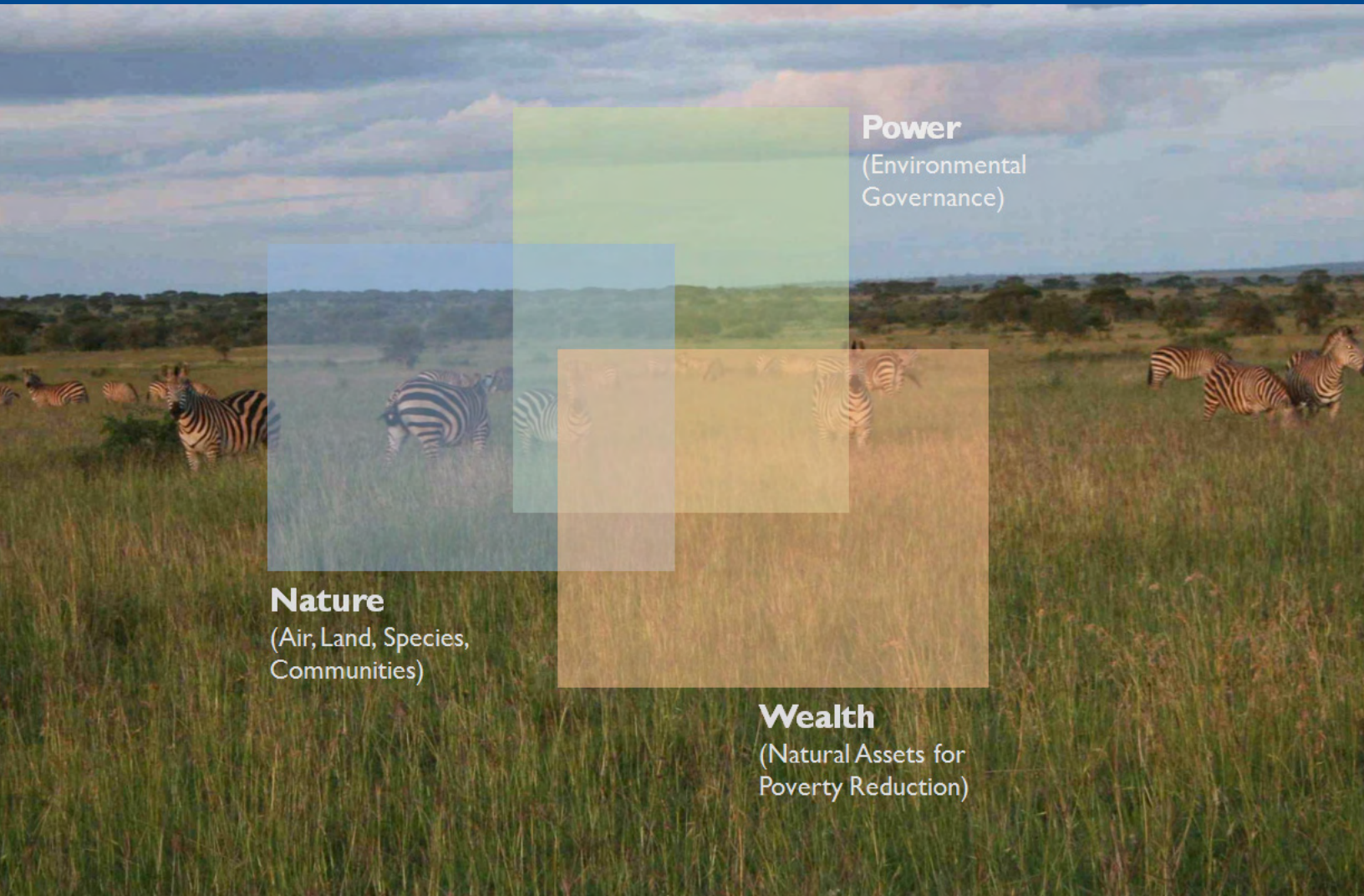


**USAID**  
FROM THE AMERICAN PEOPLE



# TRANS**LINKS**

*Promoting Transformations  
by linking Nature, Wealth and Power*



**Nature**  
(Air, Land, Species,  
Communities)

**Power**  
(Environmental  
Governance)

**Wealth**  
(Natural Assets for  
Poverty Reduction)

---

## Case Study:

**Developing Alternative Frameworks for Community-based Conservation:  
Piloting Payments for Environmental Services (PES)  
in Tanzania's Simanjiro Plains**

---

# TRANS LINKS

TransLinks is a 5-year Leader with Associates cooperative agreement that has been funded by the United States Agency for International Development (USAID) to further the objective of increasing social, economic and environmental benefits through sustainable natural resource management. This new partnership of the Wildlife Conservation Society (lead organization), the Earth Institute of Columbia University, Enterprise Works/VITA, Forest Trends, the Land Tenure Center of the University of Wisconsin, and USAID is designed to support income growth of the rural poor through conservation and sustainable use of the natural resource base upon which their livelihoods depend.

The program is organized around four core activities that will be implemented in overlapping phases over the life of the program. These are:

1. **Knowledge building** including an initial review, synthesis and dissemination of current knowledge, and applied comparative research in a number of different field locations to help fill gaps in our knowledge;
2. **Identification and development of diagnostic and decision support tools** that will help us better understand the positive, negative or neutral relationships among natural resource conservation, natural resource governance and alleviation of rural poverty;
3. **Cross-partner skill exchange** to better enable planning, implementing and adaptively managing projects and programs in ways that maximize synergies among good governance, conservation and wealth creation; and
4. **Global dissemination** of knowledge, tools and best practices for promoting wealth creation of the rural poor, environmental governance and resource conservation.

Over the 5-year life of the program, TransLinks aims to develop a coherent, compelling and, most importantly, useful corpus of information about the value of, and approaches to, integrating Nature, Wealth and Power. To do this, TransLinks is structuring the work around two core issues – 1) payments for ecosystem services and 2) property rights and resource tenure.





**USAID**  
FROM THE AMERICAN PEOPLE

# TRANSLINKS

## Case Study

### Developing Alternative Frameworks for Community-based Conservation: Piloting Payments for Environmental Services (PES) in Tanzania's Simanjiro Plains

Report prepared for WCS TransLinks Program

**Fred Nelson**  
Maliasili Initiatives

**July 2008**

#### Acknowledgements

The author worked on developing the Simanjiro easement from 2004-2005 while Tanzania program director for the Sand County Foundation Community Based Conservation Network, with the generous support of the Bradley Fund for the Environment.

This work was supported by the United States Agency for International Development (USAID) through the Leader with Associates Cooperative Agreement, No.EPP-A-00-06-00014-00. The contents of this report are the responsibility of the author and do not necessarily represent the views of USAID.



# Table of Contents

|  |    |
|--|----|
| Acronyms.....  | 3  |
| Summary .....  | 4  |
| Ecological and Socioeconomic Overview of the Site.....   | 4  |
| Local Communities and Wildlife Conservation in Simanjiro:<br>The Historical and Institutional Context..... | 11 |
| Adaptive Innovation: The Emergence of the Terrat ‘Easement’ .....  | 16 |
| Lessons Learned.....   | 26 |
| <i>Creative Collaboration</i> .....  | 26 |
| <i>Local Champions</i> .....   | 27 |
| <i>PES on the Margin</i> .....   | 28 |
| <i>Adaptive Strategies and ‘Muddling Through’</i> .....  | 29 |
| <i>PES as a Model for Community-based Conservation</i> .....   | 30 |
| <i>Future Challenges</i> .....   | 31 |
| References.....  | 32 |

## Acronyms

|        |  |
|--------|--|
| AWF    | African Wildlife Foundation                          |
| ELAND  | Enterprise Linkages for Conservation and Development |
| PES    | Payments for Environmental Services                  |
| SCF    | Sand County Foundation                               |
| TANAPA | Tanzania National Parks                              |
| TEP    | Tarangire Elephant Project                           |
| TNRF   | Tanzania Natural Resource Forum                      |
| UCRT   | Ujamaa-Community Resource Trust                      |
| WCS    | Wildlife Conservation Society                        |

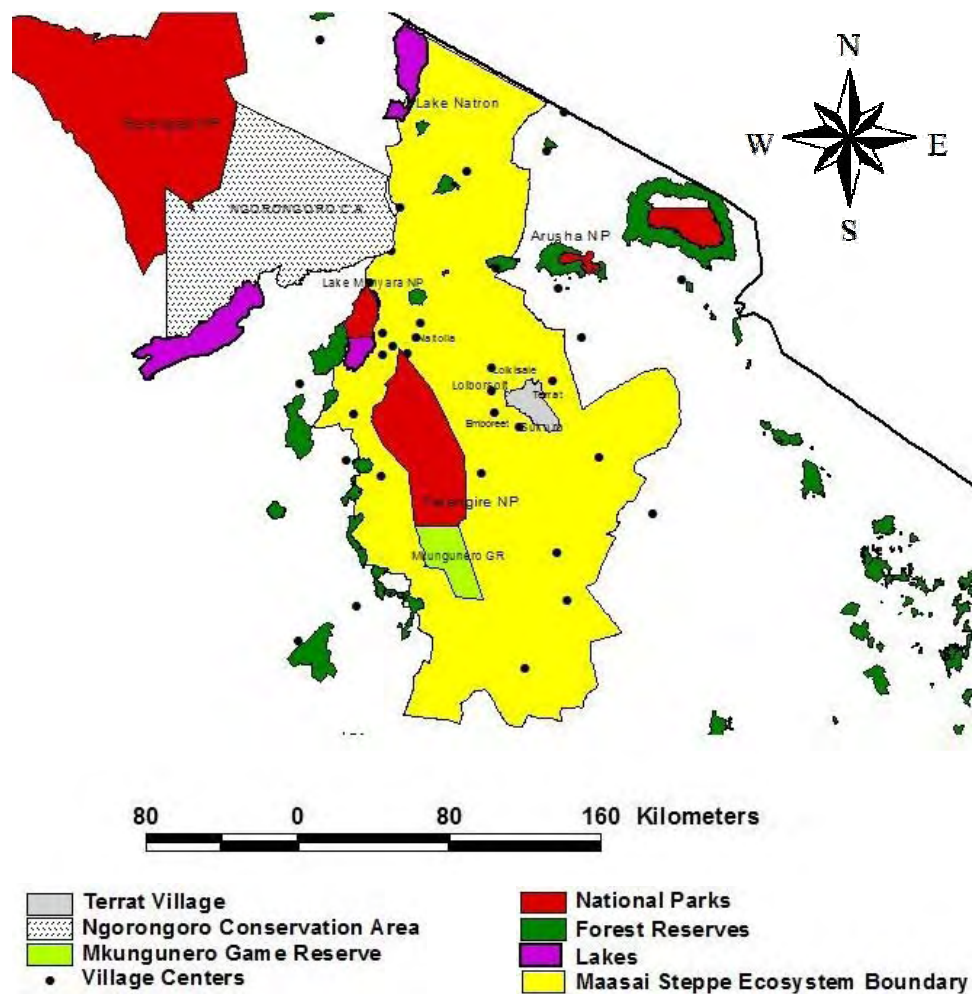


Figure 1: Geographical overview of the Maasai Steppe.

## Summary

The Simanjiro plains provide a key wet season dispersal area for wildebeest and zebra migrating from northern Tanzania's Tarangire National Park. The plains lie within the boundaries of the lands of three villages occupied by Maasai pastoralists. Wildlife populations have declined substantially over the past two decades, largely as a result of illegal over-hunting and the spread of agricultural land uses in the area. Efforts to enlist local community support for wildlife conservation have, since the 1970s, been undermined by conflicts over land tenure and resource use. In order to address the deteriorating status of wildlife populations and their habitat on the Simanjiro plains, an alternative framework for community-based conservation was developed starting in 2005 through a payments for ecosystem services (PES) agreement. This agreement emerged from the collaboration of local communities with a diverse group of NGOs and private tourism companies, several of which have extensive and long-term experience in the area. The agreement builds on customary pastoralist land use practices to build village-level incentives for wildlife conservation. The agreement has produced an important new framework for community-based conservation in Tanzanian village lands by overcoming existing institutional impediments to community involvement in wildlife conservation through a cost-effective and administratively simple PES structure.

## Ecological and Socioeconomic Overview of the Site

Tanzania's Maasai Steppe covers a vast landscape of approximately 35,000 km<sup>2</sup> in the north-central part of the country. The western boundary of the area is defined by the Rift Valley escarpment, which holds the alkaline basins of Lakes Manyara and Natron at its base. Ecologically, the ecosystem is defined by the movement of wildlife between dry season refuges with permanent water sources and wet season dispersal areas.

As in other East African savannah ecosystems, the most significant wildlife movements comprise large herds of wildebeest and zebra between dry season and wet season ranges. During the dry season, these ungulates concentrate along the Tarangire River inside Tarangire National Park, as do other species such as elephant and buffalo. Historically, the most important wet season habitat for wildebeest and zebra has been the Simanjiro plains, an area of short-grass plains lying between 25 and 40 km east of Tarangire National Park.

In the early 1970s, the Simanjiro herds were estimated at about 6,000 zebra and 10,000 wildebeest (Kahurananga, 1981). The migration of the herds to the plains from the park is driven by higher nutrient levels (particularly phosphorus) in the grasses on the plains, especially in species such as *Panicum coloratum* and *Digitaria macroblephara* which are critical to calving and lactating wild (and domestic) ungulates.

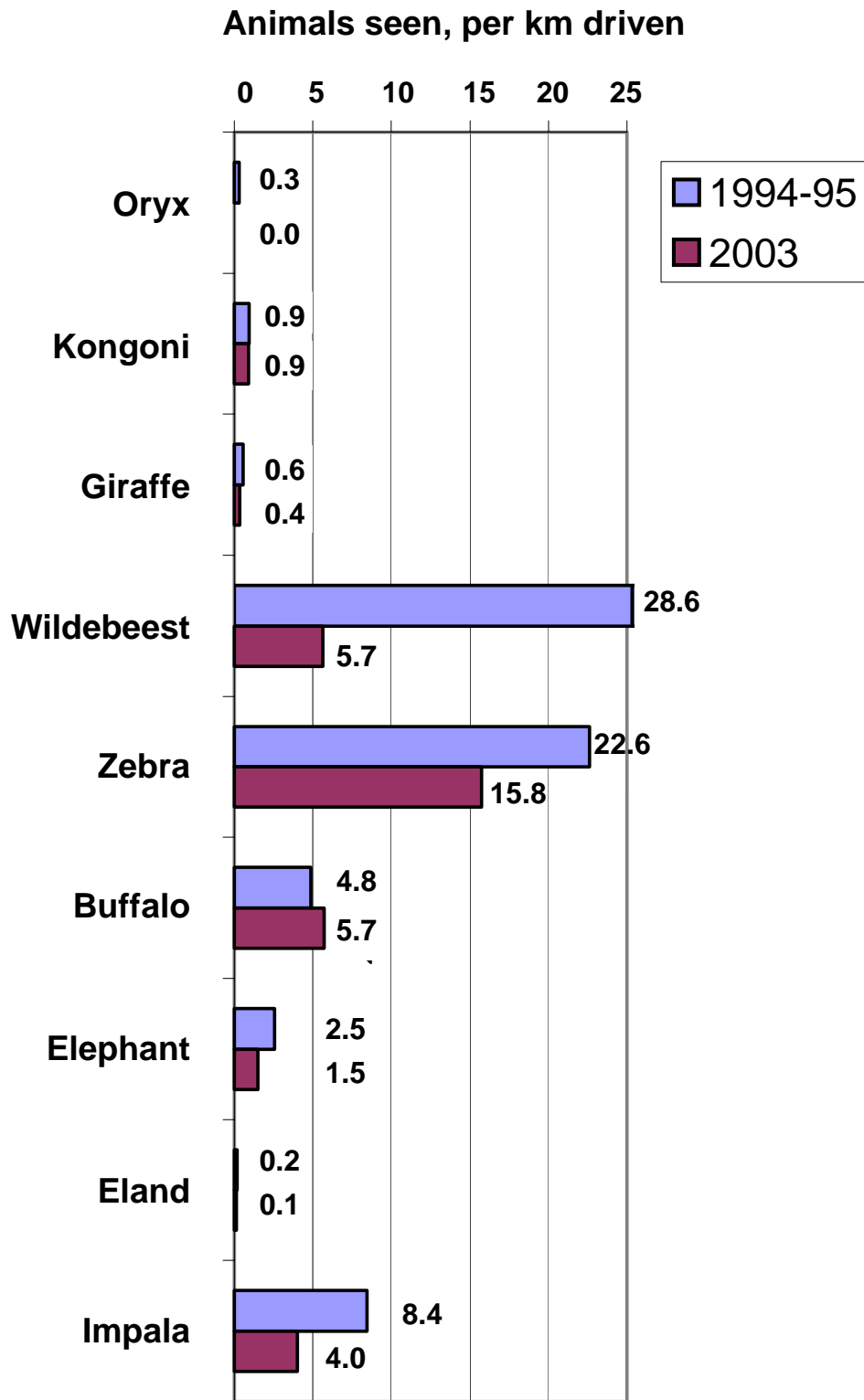
The quality of long-term data on the area's wildlife populations is limited by the difficulty of accurately surveying such a large area where wildlife movements are temporally and spatially variable and several different wet season dispersal areas exist. However, all existing survey data, as well as innumerable anecdotal reports, suggests that wildlife in the Simanjiro plains and in the broader Maasai Steppe have undergone a substantial decline (see Stoner et al., 2007). For example, dry season road counts inside Tarangire National Park carried out by the Tarangire Elephant Project in 1994/95 and 2003 recorded declines of about 40% and 80% in zebra and wildebeest, respectively, between the two periods (Figure 2). The most recent estimates from the Simanjiro plains suggest that the wet season wildebeest population is now only 2,000-3,000 animals at most (T. Morrison, unpublished data)<sup>1</sup>.



© F. Nelson

*During the wet season thousands of zebra and wildebeest migrate to the Simanjiro plains.*

<sup>1</sup> For more detailed information on the status of the area's wildlife populations refer to Nelson, 2005.

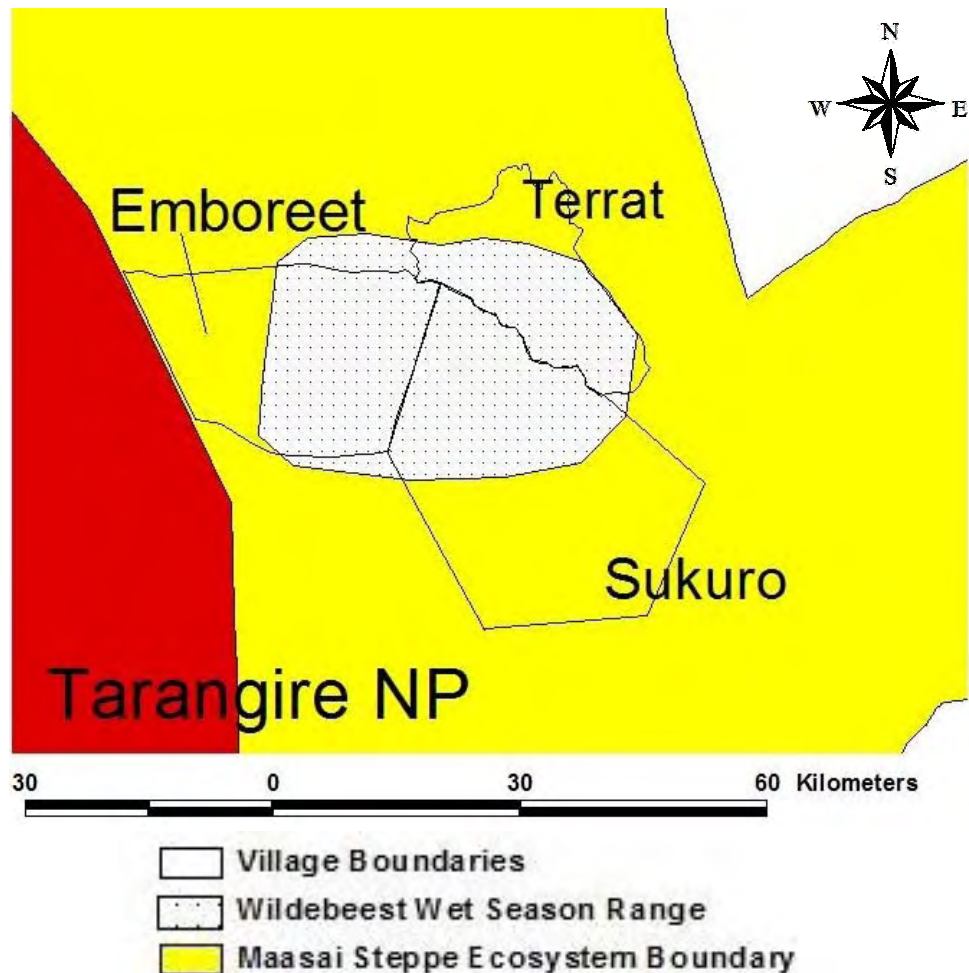


**Figure 2: Wildlife densities in Tarangire National Park 1994/95 and 2003 (dry seasons);** changes in wildlife densities in Tarangire National Park during the dry season as recorded in road strip counts. Note the substantial declines of wildebeest, zebra, and impala during the period. Source: Tarangire Elephant Project.



The Simanjiro plains, as with over 90% of the Maasai Steppe, lie outside the boundaries of state protected areas, on lands owned and managed by local communities. Administratively, the Simanjiro plains fall within Simanjiro District, one of about 120 districts in the country. In Tanzania, rural communities are administratively and statutorily divided into villages, which are comprised of Village Assemblies (all the adult residents of the village) and elected Village Councils of 15-25 members headed by a Village Chairman. The majority of the Simanjiro plains dispersal area is contained within three villages: Emboreet, Sukuro, and Terrat.

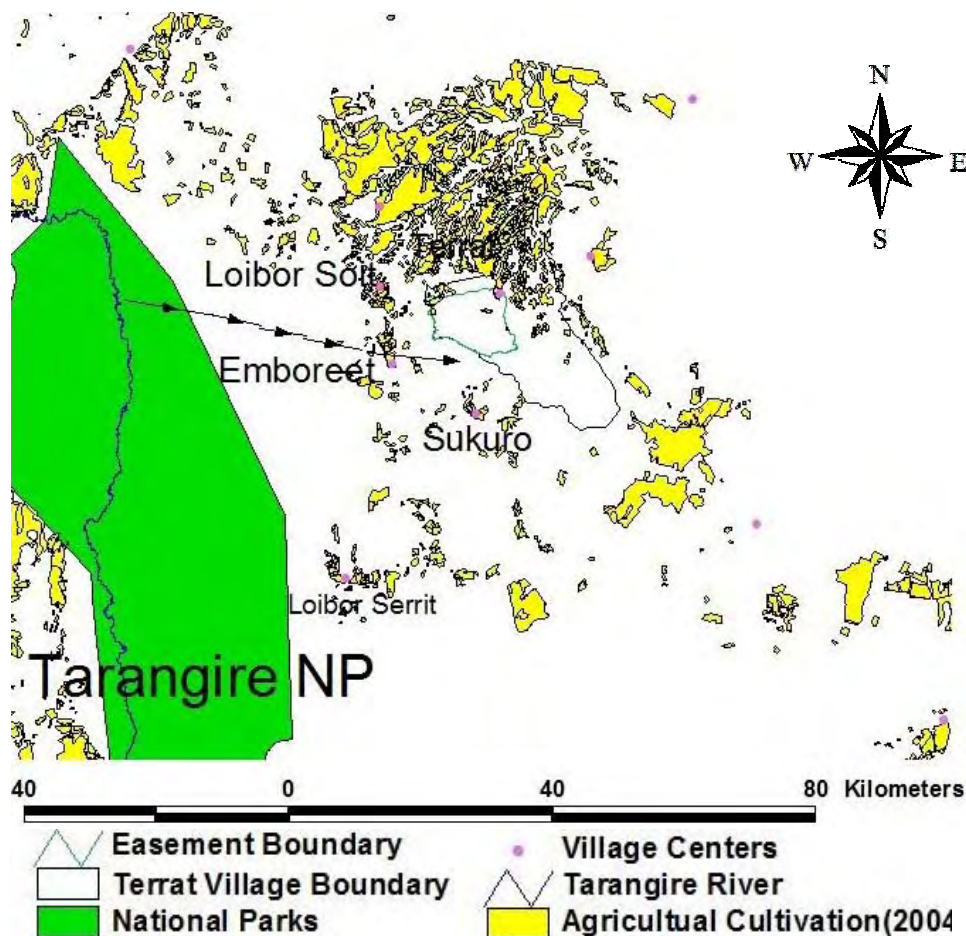
Village Councils are corporate entities capable of entering into legal contracts, owning property, and preparing by-laws which, if approved by the Village Assembly and the District Council, have full force of law. Village Councils are also the designated legal authority, under the 1999 Land Act and Village Land Act, for managing village lands held under customary rights of occupancy. That



**Figure 3:** Location of Simanjiro plains wildebeest wet season dispersal area in relation to Emboreet, Terrat, and Sukuro village boundaries and Tarangire National Park. All boundaries are approximate.

land legislation also permits villages to designate lands as individual lands, which are vested in individual village members for activities such as building homes or shops or practicing agricultural cultivation, and communal lands for collective uses, such as forests or rangelands.

Most of Simanjiro District is populated by Maasai pastoralists. The Maasai traditionally manage most of their lands as communal rangelands. Maasai grazing practices are ecologically adapted to their environment, employing spatial and temporal systems of movement and pasture reservation to prevent over-grazing and provide a safety net in light of the area's highly variable rainfall conditions. All pastures are shared by members of the community, and rules over pasture access are determined and enforced collectively. A key element of Maasai range management is the designation of large areas as dry season grazing reserves (*ronjo*)



**Figure 4:** Agricultural cultivation in the Maasai Steppe as of 2004. Arrow represents general path of wildebeest migration to the Simanjiro plains, which are becoming encircled by agriculture on all sides but particularly from the north, representing a wave of settlements and agriculture moving south from Arusha town.

**Table 1:** Amount of land under cultivation in eight Simanjiro Villages in 2004.  
Source: Sachedina, 2006.

| Village Name | Converted (ha) | Village size   | % of Village |
|--------------|----------------|----------------|--------------|
| Loswaki      | 6,906          | 12,635         | 54.66        |
| Loiborsoit   | 5,722          | 33,134         | 17.27        |
| Terrat       | 3,313          | 21,277         | 15.57        |
| Narakauwo    | 5,056          | 68,955         | 7.33         |
| Emboreet     | 2,634          | 38,072         | 6.92         |
| Loiborsirret | 2,833          | 63,832         | 4.44         |
| Sukuro       | 2,536          | 69,582         | 3.64         |
| Kimotorok    | 93             | 98,096         | 0.09         |
| <b>Total</b> | <b>29,093</b>  | <b>405,583</b> | <b>7.17</b>  |

which are generally used only during the second half of the long dry season (e.g. around July-October).

The general compatibility between Maasai pastoralist livestock management practices and large mammal populations in northern Tanzania is well-documented (Homewood and Rodgers, 1991). One important element of this interaction is that wildebeest carry a pathogen called Malignant Catarrhal Fever which is deadly to cattle. This pathogen is carried in the afterbirth of calving wildebeest, and thus pastoralists avoid any spatial intermingling of cattle and wildebeest during the relatively brief seasonal calving periods. Because these calving periods occur on the wet season dispersal habitats, including the Simanjiro plains, livestock herders avoid these areas for parts of the year.

Although the Maasai are traditionally pastoralists, they often and increasingly employ agricultural cultivation as a livelihood strategy. The amount of land farmed in the Maasai Steppe has increased considerably over the past thirty years, driven by several basic dynamics.

First, as human populations in northern Tanzania's highlands (e.g. land around Mount Meru and Mount Kilimanjaro) have increased, land scarcity has driven immigration to semi-arid rangelands such as the Maasai Steppe. These settlers have gradually bought up much of the land, moving south towards the Simanjiro plains from Arusha, blocking the northward wildlife migration routes out of Tarangire and threatening to expand onto the Simanjiro plains themselves.

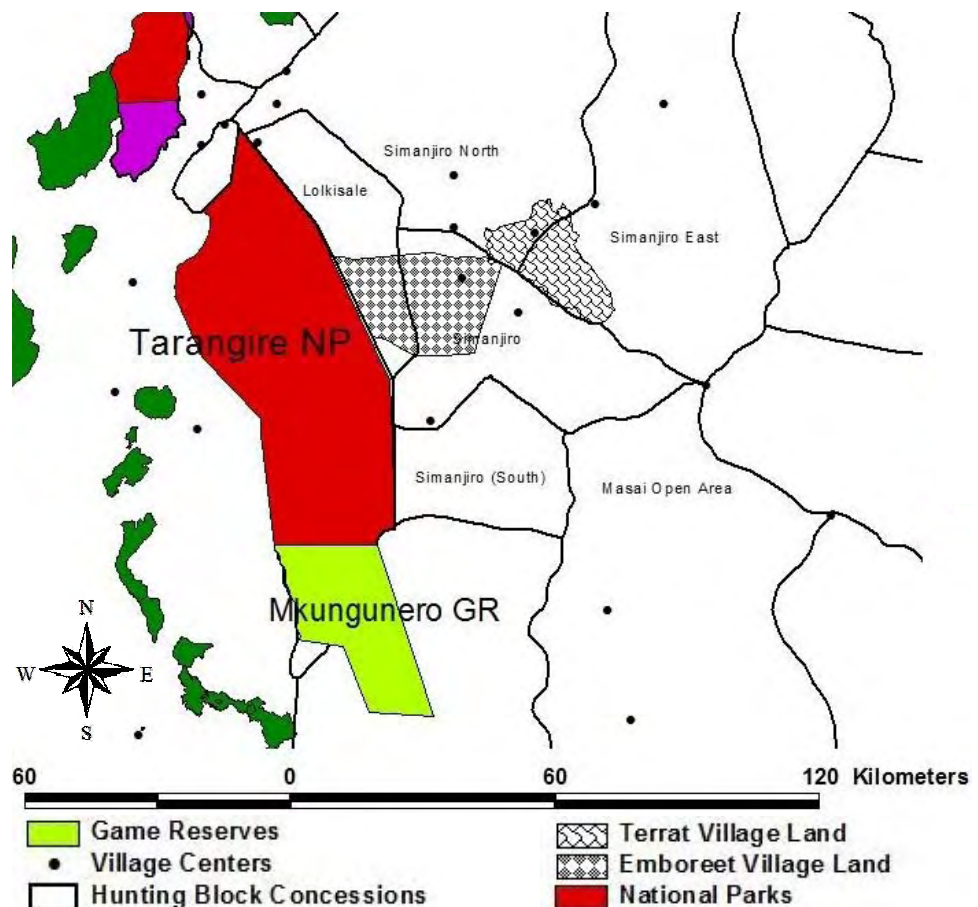
Second, the pastoralist economy has deteriorated as a result of increased human populations (and thus lower per capita livestock holdings) and the loss of land, including key dry season grazing territories, to state agricultural projects and conservation areas (see following section). This has led pastoralists to take up cultivation as an increasingly necessary livelihood strategy. Lastly, pastoralists are also cultivating, particularly in some villages adjacent to Tarangire National Park, as a defensive strategy to prevent more land being appropriated by the state for wildlife conservation (Sachedina, 2006).

Agriculture, and associated habitat destruction, represents the greatest long-term threat to wildlife populations in the Maasai Steppe, although recent declines in wildlife populations are probably more a function of widespread illegal exploitation for bushmeat. This illegal use, in turn, is a function of: a) the lack of state investment in law enforcement outside protected areas; and b) the ownership of wildlife by the state and lack of local community incentives for conserving the resource. This highlights the importance of community involvement in wildlife conservation in ecosystems such as the Maasai Steppe, where most land is owned and managed by private landholders or village communities.



© F. Nelson

*The Simanjiro plains provide critical wet season grazing habitat for wildlife and dry season grazing for pastoralists from Terrat and neighboring villages.*

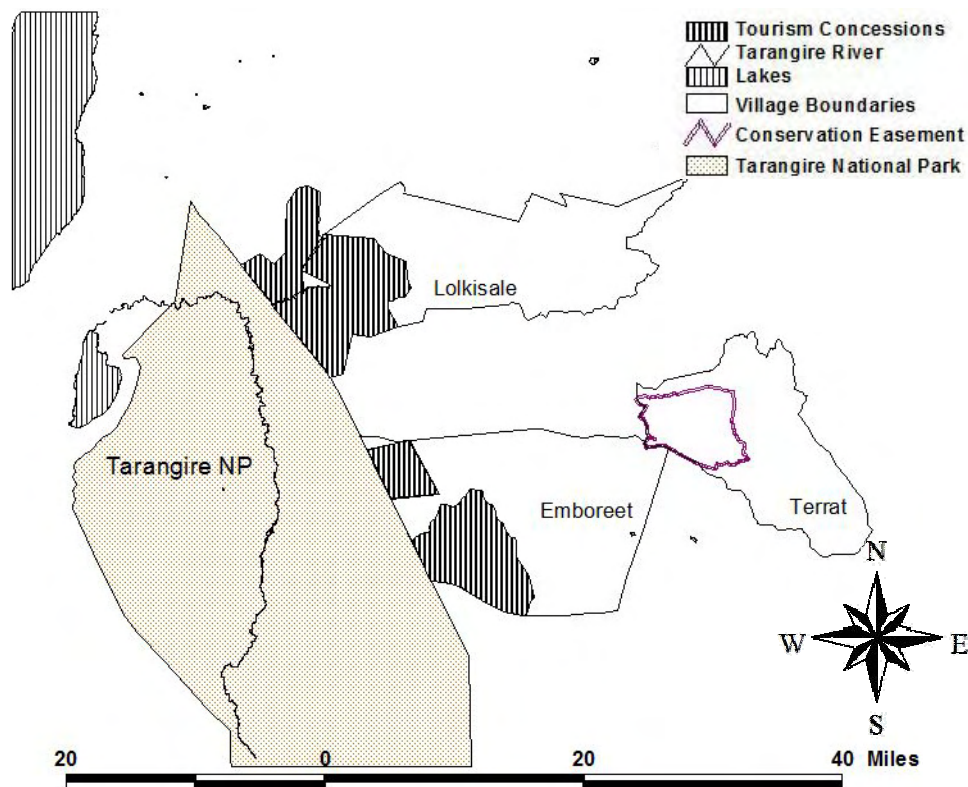


**Figure 5:** Tourist hunting concessions in Maasai Steppe outside Tarangire National Park. Note the overlap of village land areas and hunting concessions. All boundaries are approximate and for illustrative purposes only.

## Local Communities and Wildlife Conservation in Simanjiro: The Historical and Institutional Context

In 1970, Tarangire National Park was created and local pastoralists were evicted. Because pastoralists lost access to the critical permanent water sources of the Tarangire River and Silalo swamps in the southern part of the park, this change had a major impact on local livelihoods, land use patterns, and perceptions of wildlife conservation (Igoe, 2004).

Despite the creation of Tarangire National Park, conservationists remained aware that the entire wet season habitat in the Maasai Steppe remained on community lands and that, therefore, wildlife conservation aims remained dependent on land use practices in the broader ecosystem. In 1982, the director of the Frankfurt Zoological Society put forth a proposal to create a multiple-use



**Figure 6:** Location of tourism concessions based on village-operator contractual agreements, in relation to Tarangire National Park, Simanjiro villages, and Terrat easement.

conservation area, modeled on Ngorongoro Conservation Area, in the Simanjiro plains. The proposal called for prohibiting agriculture and de-stocking pastoralists' herds (Borner, 1985). This proposal was vigorously resisted by local communities in Simanjiro, whose livelihood interests would have been negatively impacted by such a move. Thus, villages mobilized to secure formal legal title to their lands and develop strategies for resisting expansionist conservation initiatives (Igoe and Brockington, 1999). The 'Simanjiro Conservation Area' proposal was never implemented.

By the 1990s, the conservation rhetoric in the Maasai Steppe- and Tanzania more generally- increasingly came to focus on community participation and involvement. Tanzania National Parks (TANAPA) initiated a community outreach and benefit-sharing program in the late 1980s designed to improve local relationships and build community support for the park. The African Wildlife Foundation initiated a series of projects in the Maasai Steppe and Simanjiro during the 1990s, spending millions of dollars- largely sourced from USAID's Tanzania mission- attempting to develop community-based conservation approaches.

Despite these nominal shifts towards community-based approaches, in practice, conservation authorities and interests continued to promote expansion of state protected areas and restriction of local livelihood options. In 1996, the Mkungunero Game Reserve was gazetted to the south of Tarangire, although this area's change in status was not widely known until 2003. When it did become known, it set off a new series of conflicts over land rights and resource access between villagers in the southern part of Simanjiro District and state wildlife authorities (Masara, 2005). Although Tanzania adopted a wildlife policy in 1998 which advocated devolution of benefits and management authority to local communities, ten years later wildlife effectively remained under strict central control (Nelson, 2007). In particular, the lucrative tourist hunting industry, largely based on concessions situated on community lands as in Simanjiro District (Figure 5), remained under central control. In Simanjiro, annual revenue generated from tourist hunting is estimated at around \$250,000 in direct government revenue (Sachedina, 2006), with none of this income flowing directly to the villages where these activities occur.

Since the government's wildlife policy called for devolution but maintained the conventional 'fortress' approach in practice, international funding from USAID and AWF had limited somewhat ambiguous impact on building local incentives and support for conservation. Faced with recurrent tensions between local communities in Simanjiro and government management agencies over land and resource rights and control, these external actors may at times have, contrarily, supported the more powerful governmental agenda as a result of their own organizational interests and missions (Igoe, 2004; Igoe and Croucher, 2007; Sachedina, 2008).

Other actors developed more grassroots approaches to community-based conservation in the Maasai Steppe. Starting around 1990, several visionary tour operators initiated the first tourism agreements with villages in northern Tanzania, including one in Emboreet village in Simanjiro District (Dorobo Tours and Safaris and Olivers' Camps Ltd., 1996). These agreements were initiated as much as a community-based approach to conservation in the face of agricultural expansion in Maasai rangelands as they were a result of private business interests. The agreements provided for annual lease payments and per-client, per-night payments from the operators to the village in exchange for community allocation of a concession area where agriculture and charcoal production would not be allowed. Dorobo Tours' contractual relationship with Emboreet village has endured since 1991, making this one of the

longest-running community conservation ventures in the country. By the late 1990s this model for community-based tourism and conservation outside of state protected areas was spreading, with a series of other concession areas becoming established outside of Tarangire National Park's eastern boundary (Figure 6). By this time, about 40,000 ha, in several villages, had been set aside as tourism concessions, conserving wildlife habitat in a large stretch of village land outside the park. Revenue also increased, with Emboreet village earning over \$40,000 annually from two tourism concession agreements by 2005 (Sachedina, 2006). However, due to conflicts between tourism activities and centrally-managed hunting concessions, from 1999 onwards central regulatory and administrative actions repeatedly challenged the legality and viability of these ventures by either attempting to prohibit them outright or attempting to divert payments from the village to higher levels of government (Nelson, 2004).

Thus, the conservation challenge in Simanjiro by the early years of the twenty-first century could be characterized as follows:

Conservation depended on local villagers working to conserve wildlife by preventing illegal use and preventing agricultural expansion.

- Conservation practice was historically characterized by protected area expansion, loss of community lands and resources, and recurrent tensions between local communities and wildlife authorities. Although the rhetoric of community participation and empowerment was adopted in formal wildlife policy during the 1990s, largely as a result of external donors' influence, little changed institutionally or on the ground and, in fact, central control over wildlife continued to expand. The bulk of wildlife's economic value in Simanjiro continued to be captured centrally through the system of tourist hunting concessions<sup>2</sup>,
- Important innovation occurred in the 1990s as a result of local initiatives to develop community-based tourism concession agreements between private tour operators (led by Dorobo Tours) and several villages bordering Tarangire National Park.



© C. and L. Foley

*East African Elephants.*

<sup>2</sup> For more on tourist hunting management and institutional reform, see Baldus and Cauldwell, 2004.



While these agreements have endured and created substantial local economic and conservation benefits, they have not been supported by central government institutions. Importantly, these tourism concessions are all located in the woodlands and savannahs adjacent to Tarangire National Park, and *not on the short grass plains which are much farther from the park boundary.*

This was the context in which the Terrat PES agreement arose, as an effort to provide a locally-acceptable framework for conserving wildlife and its habitat by building on local land use patterns and livelihood interests, rather than undermining them, and by recognizing that *de facto* government policies of continued central monopolization of wildlife benefits limit the existing institutional options for making wildlife a valued form of land use to local communities.



© F. Nelson

*Terrat village center.*

<sup>3</sup> <http://www.tnrf.org>

<sup>4</sup> Dorobo Tours and Ujamaa-Community Resource Trust have long-standing linkages. In establishing the first community-based tourism ventures, Dorobo Tours was pursuing a community-based conservation strategy which they believed essential if wildlife in northern Tanzania was to persist outside protected areas. The directors of Dorobo Tours (Dave, Thad, and M ke Peterson), who grew up in Tanzania, have played a role well beyond that of private entrepreneurs in these conservation and development issues since the 1970's. Dave Peterson carried out an early study of wildlife movements in the Maasai Steppe in the mid-1970's, and the brothers became involved as consultants in early land use planning initiatives in the area in the mid-1990's. This work led them to form a community-based NGO, staffed by local Tanzanian community members and social activists, starting in 1997, which could work with communities to build local capacity for natural resource management. The NGO evolved into the UCRT, which over the past decade has become the premier organization for building community capacity for natural resource management across over thirty villages in northern Tanzania. Dorobo Tours, through a US-registered charity, the Dorobo Fund for Tanzania, plays a significant role in financially supporting the organization.

## Adaptive Innovation: The Emergence of the Terrat 'Easement'

The underlying barriers to wildlife conservation on community lands in northern Tanzania, as summarized above, were not limited to Simanjiro or the Maasai Steppe, but, rather, reflected governance problems facing wildlife (and other natural resources) throughout the region and the country as a whole. In response to these institutionally-rooted problems, several individuals and organizations began working in 2002 to create a new type of local organization that could integrate conservation, economic development, and governance issues to build the kind of long-term strategies necessary for addressing such complex institutional problems. This organization evolved into the Tanzania Natural Resource Forum<sup>3</sup>. Key initial players in the creation of this organization were Dorobo Tours, Ujamaa-Community Resource Trust (UCRT)<sup>4</sup>, Wildlife Conservation Society (WCS) (through the Tarangire Elephant Project- TEP), and Sand County Foundation (SCF). Collaboration amongst these same organizations was also a key to the emergence of the Terrat easement.

By 2003/04, discussions between these organizations about the problems facing conservation on community lands and declining wildlife populations in places like the Maasai Steppe were ongoing. Dorobo Tours had a long-standing involvement in the area through their community-based tourism concession in Emboreet village; a village which was, however, also responsible for much of the ongoing agricultural expansion onto the Simanjiro plains (Sachedina, 2006). UCRT had worked with Emboreet since the late 1990s to develop a land use plan and village by-laws. It was also collaborating with SCF at this time on community legal training seminars in Simanjiro and other regions of northern Tanzania. WCS/TEP had been involved in working with a private operator and local villages to the north of the Simanjiro plains, in Lolkisale and Makuyuni villages, on zoning areas for wildlife, tourism, and livestock.

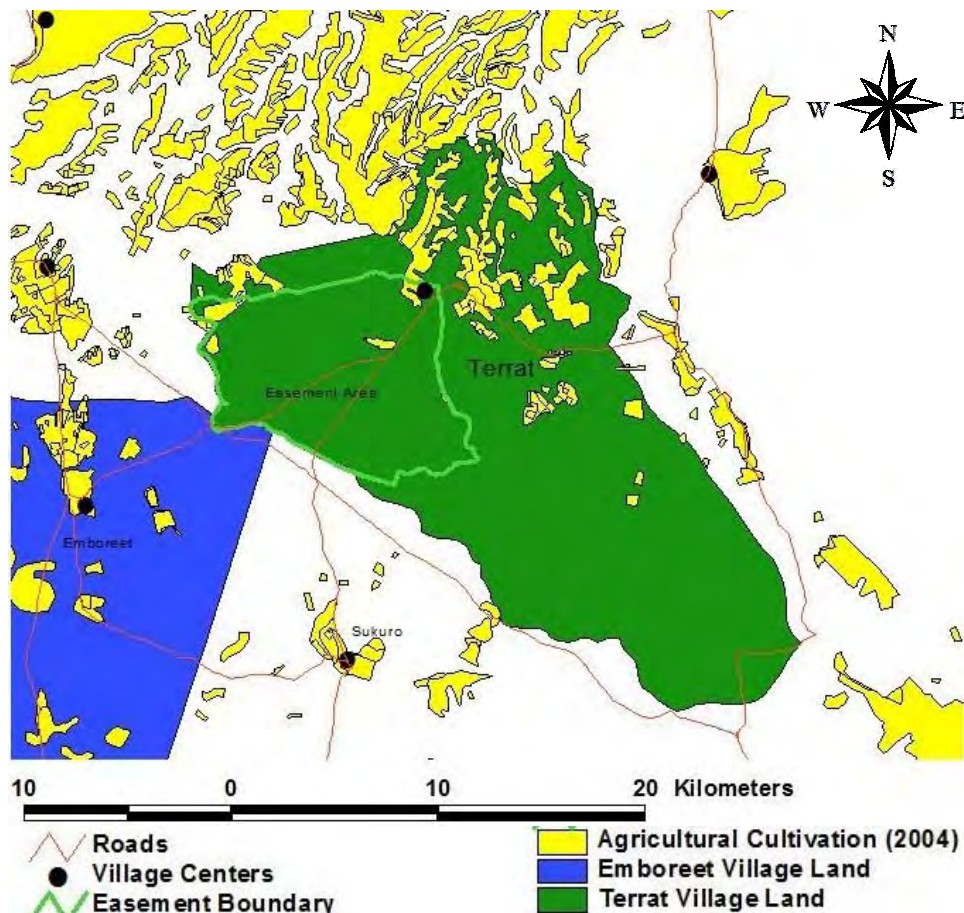
Initial discussions amongst these collaborating organizations recognized the fundamental problem in Simanjiro: wildlife needed to generate economic returns for local communities, but the continuation of centralized conservation policies undermined this aim and continued to fuel negative local attitudes towards wildlife conservation. An additional practical problem was that while community-based tourism ventures had enabled villages to protect much of the habitat immediately bordering Tarangire National Park,

tourism was not viable on the Simanjiro plains, due to a range of factors<sup>5</sup>. Alternatives needed to be found, and initial discussions emerged among those collaborators of the possibility of designing a PES-type framework, or a community-based 'conservation concession'. At the time it was not clear where the financing for such a scheme would come from or what the scale of such an initiative would be.

The impetus for actually developing an experimental PES scheme on the ground in Simanjiro came from a proposal put forth by Hassan Sachedina, who at the time was a staff member of AWF but was also carrying out his doctoral field research on conservation and livelihoods in Emboreet village. His proposal was for a project called Enterprise Linkages for Conservation and Development (ELAND). The basic concept was to create a basket fund from a combination of tourism company contributions (e.g. through a \$1 per night special levy on all clients staying at lodges in Tarangire National Park) and funds raised by NGOs such as AWF or WCS. The ELAND proposal led to a meeting of NGOs and private tourism and hunting companies active in the Tarangire-Simanjiro area in July 2004, where key trends in the ecosystem were reviewed and potential remedial strategies discussed.

Follow-up discussions amongst Dorobo, UCRT, TEP, and SCF recognized the potential of the ELAND concept to mobilize financial resources to create a local 'conservation concession' according to PES principles in Simanjiro. The proposal's greatest innovation was its novel idea of pooling financial resources from tourism operators whose businesses depended in part on Tarangire National Park. Concerns emerged, however, on two key points. The ELAND proposal envisioned creating a new legal trust with a range of trustees representing private sector, government, and NGO representatives which, while inclusive, seemed bureaucratic and had the potential to divert large amounts of time and energy in creating new organizational structures rather than focusing efforts at the village level. ELAND thus seemed in danger of becoming yet another top-heavy initiative in a region where a great deal of money had been spent on community-based conservation with limited on-the-ground effect. Secondly, there was a fundamental problem with linking any new community-based conservation initiatives in Simanjiro with international conservation organizations, such as AWF, as a result of the local history of tensions between external conservation interests and local communities' land rights and livelihood concerns (see Igoe, 2004).

<sup>5</sup> Particularly the fact that most wildlife is found on the plains during the rainy season, when the area's black cotton soils can render driving in the area somewhat treacherous. During the dry season accessibility is improved but most of the wildlife returns to the vicinity of permanent water sources within the park.



**Figure 7:** Location of the Terrat easement, as surveyed by the contracting tour operators and village representatives in November, 2005. Note the location of most agricultural cultivation to the east of the easement area, on the other side of the village center.

Since Dorobo Tours was the private sector actor with the longest history in Simanjiro and strong experience in community negotiations and collaborative conservation processes, they took the lead in building support among a core group of private operators for a village-based PES scheme in Simanjiro. At the time (the second half of 2004 and first half of 2005) this included not only tourism operators but also Tanzania Big Game Safaris, the hunting company which leased the hunting concession in Simanjiro which overlapped with part of Terrat and Sukuro village's lands as well as those of other villages to the south. Dorobo built consensus among the operators for investing a small amount of financial resources in a pilot PES scheme, but the decision was made to delink the initiative from the original ELAND proposal due to the concerns about costly bureaucracy and formal links with AWF which might raise concern at the village level.

By early 2005, momentum was building for an experimental PES scheme in Simanjiro, but it was not yet clear exactly what shape this would take or what its coverage and cost would be. Initial discussions revolved around the seven key villages to the east of Tarangire National Park, and later focused on the three which contain virtually all the key short grass plains habitat (Emboreet, Terrat, and Sukuro).

At this time, the decision was made to initiate a 'conservation concession' with Terrat village based on set annual payments in exchange for the community's protection of its portion of the short grass plains, as a result of the following strategic considerations:

- Emboreet village was the source of much of the agricultural expansion onto the plains from the west, but also had a strongly antagonistic outlook towards wildlife conservation initiatives (see Sachedina, 2008). Because so much agricultural conversion was occurring, it seemed like Emboreet would be potentially the most difficult village in which to initiate a PES scheme for protecting the plains, as there would be substantial opportunity costs to villagers and the scheme would likely encounter local resistance. Thus, both financial and political considerations did not favor Emboreet, although this was where the problem of habitat loss/land use change was most pronounced.
- Terrat village, by contrast, had a history of excluding agricultural expansion from the short grass plains which made up roughly a third of their village land area, and maintaining the plains for livestock grazing. In 1997, outsiders with high-level regional political connections had invaded the plains in Terrat and started cultivating land. The village mobilized rapidly and evicted these settlers, both physically and legally through a subsequent court case. Farming had been effectively excluded



© F. Nelson

*A range of large predators such as lion still exist outside of state*

from Terrat's portion of the plains since then, and this incident demonstrated the enduring vitality of Terrat's *collective* land and resource management institutions.

- It is important to emphasize that the decision to start with Terrat rather than Emboreet was explicitly a 'thin end of the wedge' strategy. The aim was to initiate the easement in a village that seemed most conducive to such an agreement. By establishing a successful and mutually acceptable pilot initiative, opportunities would be created to later expand to other villages, including the more challenging context of Emboreet.

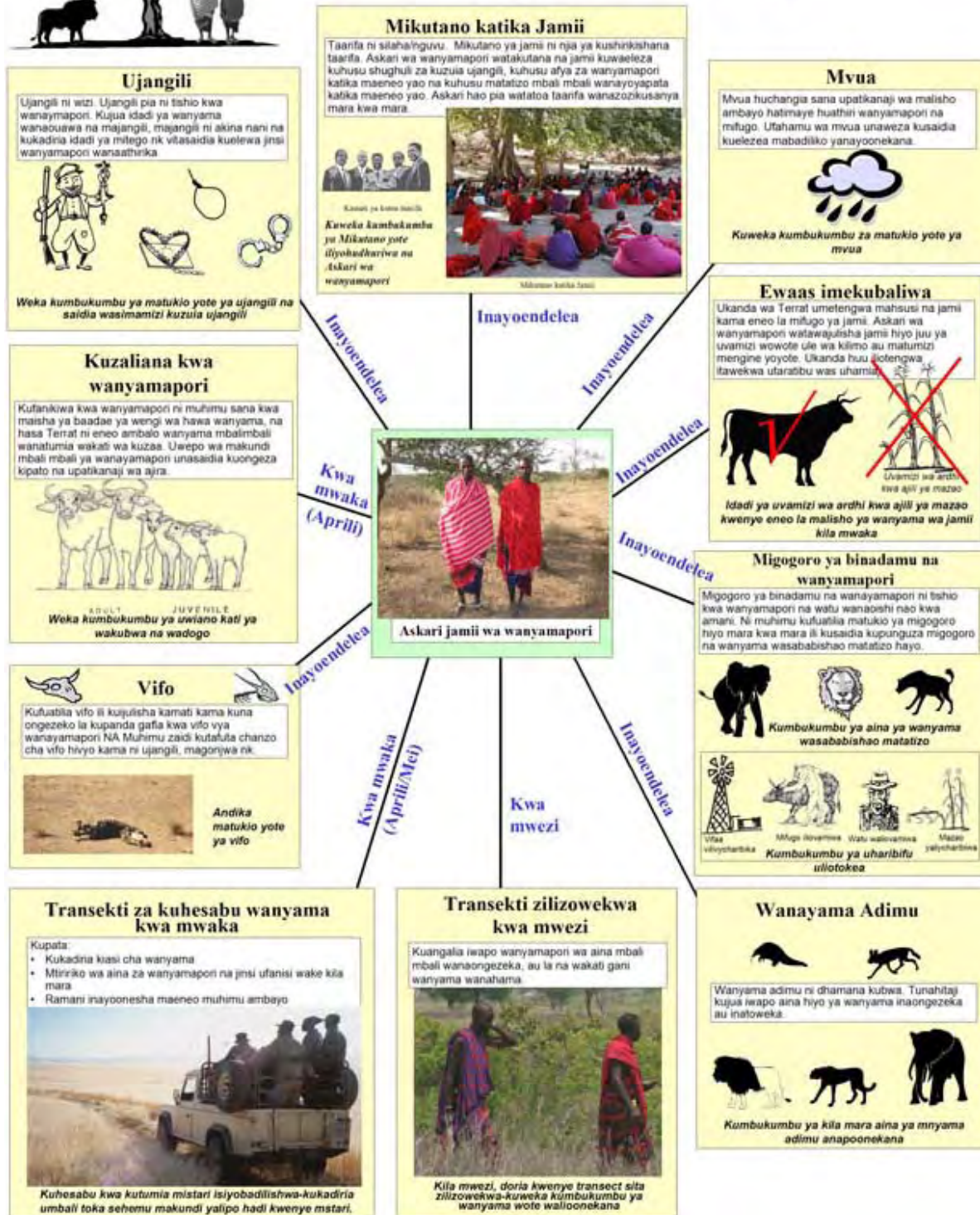
Terrat was thereby chosen as the site to attempt to implement a PES arrangement financed by annual contributions from a small group of tourism operators, with Dorobo Tours taking the lead in presenting the initiative to the village and brokering the deal. The basic PES concept was that, although the plains were already protected by Terrat as a seasonal livestock grazing reserve (a dry season reserve used mainly July-October), an added financial payment could serve to: a) prevent any future moves by individuals or the community to convert parts of the plains to agriculture; and b) provide incentives for the community to not only tolerate but actually conserve wildlife by protecting it from bushmeat poaching by outsiders. Beyond these direct impacts in Terrat, the initiative would provide a new and locally-acceptable framework for community-based conservation, which could later be scaled up to include other villages in key dispersal areas.

The basic proposal put to Terrat was as follows: the tour operators would pay the village an annual fee in exchange for the village agreeing to prevent agricultural cultivation, charcoal production, and illegal hunting on their portion of plains.

Dorobo proposed a sum of five million Tshs (roughly \$4,500); a small enough amount that it would be feasible for the operators to contribute every year, but large enough to provide a meaningful incentive at the village level.

The implementation of the proposed initiative was led by Dorobo Tours and UCRT. Dorobo continued to organize the tour operators, securing pledges of financial support from four other operators. Three of these operators (Sopa Lodges, Tarangire Safari Lodge, and Asilia Lodges) own permanent tourism facilities inside Tarangire National Park. The main initial motivation for them was to contribute resources to an initiative that would improve the status of the wildlife populations in the park that their businesses

# Askari Jamii wa Wanyamapori (Terrat, Tanzania)



**Figure 8:** Poster illustrating game scouts' responsibilities and annual work plan, as adapted from the Namibian event book monitoring system. This poster is posted in the Terrat village government office. Poster is written in Kiswahili.

relied upon, although non-financial conservation motivations were also an important factor. Notably, as the negotiations moved forward, the one hunting company involved, Tanzania Big Game Safaris, dropped out of the operator consortium. The hunting company was concerned about the deal being a mechanism for tourism activities to expand into its hunting block and about the formal recognition of village land rights in its hunting concession; and, furthermore, they simply did not want to spend the money.

UCRT worked in their role as a local capacity-building facilitator organization to broach the concept locally. UCRT first reached out to several local elites, including Ilaramatak Lorkonerei, a local development organization based in Terrat with a long history of land rights advocacy in Simanjiro, including opposition to wildlife conservation interests<sup>6</sup>. The discussions were gradually expanded in August and September 2005 from the village leadership to all the sub-village leaders, and, finally, to endorsement by the Village Assembly. In October the tour operators and village leadership met in Terrat, and in December the final contract was signed.

No significant changes were made to the written contract from the proposal initially brought to the village; the final deal provided that five million Tshs. be paid to the village annually in exchange for the prohibition of agricultural cultivation and charcoal production in the easement area and the village's pledge to seek to prevent illegal hunting. All livestock-based uses would continue per the community's traditional practices. The one addition that was made, informally, was the village's request that the operators also fund four village game scouts who would work to protect the wildlife and other natural resources in the village and thereby enforce and monitor the easement's provisions. This was agreed to in principle by the operators, although TEP later agreed to fund these game scouts, with UCRT administering their salaries and provision of equipment.

Several points need to be emphasized with regard to how the proposal was received at the village level and the relatively harmonious negotiation over establishment of the easement. First, a key to the easement is that it is based on supporting traditional land use practices, and that pastoralist communities in Terrat and elsewhere face their own internal trade-offs with respect to maintaining land as livestock pasture or allowing land to be converted to agriculture. In Terrat, the short-grass plains have always been

<sup>6</sup> This opposition was at one time directed against the Petersons, directors of Dorobo Tours, in 1997 when they were working on land use planning in Simanjiro District for the Swedish-funded Land Management Programme. When the Petersons attempted to facilitate a land use planning process in Terrat, Ilaramatak successfully mobilized the community to oppose the process, arguing that it was just another attempt to steal the community's lands for wildlife conservation interests.



managed as a dry season grazing reserve for livestock, and agriculture has been excluded and limited to other portions of the village land. For the village, agreeing to a formal contractual prohibition on agriculture in this area bore no immediate costs, and in fact served to reinforce the community's existing land use practices.

Second, the main potential barrier to the easement agreement was not the structure of potential opportunity costs to the community in adopting it, but rather the entrenched suspicion of wildlife conservation interests as a threat to local land rights and livelihoods throughout Simanjiro. This barrier was addressed strategically, by introducing the proposal first to several elite leaders from Terrat, including the director of Ilaramatak Lorkonerei, an organization which had in the past been at the forefront of mobilizing opposition to conservation initiatives. Ilaramatak not only supported the idea, but assisted UCRT in facilitating the village-level meetings to discuss the proposal, which led to its fairly expeditious endorsement.

Third, an important factor in the community's acceptance of the deal was the long-standing existence of the village-operator tourism contracts and concessions in neighboring villages, particularly Emboreet. It was also significant that Dorobo Tours had been practicing tourism in Emboreet for nearly 15 years and was therefore well-known throughout the area. The community's familiarity with these tourism ventures made the easement proposal easily understandable, and helped allay possible fears about hidden wildlife conservation agendas. As Dorobo emphasized during the crafting of the initial easement proposal, a key strategy was to present the easement as a business proposal based on the tour operators' financial stake in the health of the Tarangire-Simanjiro wildlife populations, so as to ensure the community understood the rationale of the easement and to dispel fears of hidden conservationist agendas. This was a rationale for limiting the easement fund, at the outset, to contributions from tourism companies only.

Following the signing of the easement contract, a village-level management board was established, consisting of five villagers elected by the Village Assembly every five years. This is the organizational mechanism for communication between the operators and the village, as well as the village-level institution responsible for overseeing the receipt and use of the annual payments. In addition, four village game scouts were selected by the village;



© C. and L. Foley

*East African Elephants at Tarangire.*

two permanent scouts and two who rotate every six months. These scouts are paid 60,000 Tshs (~\$50) monthly, using funds provided by TEP and administered by UCRT. The scouts report to the village easement management board, which in turn reports to the Village Assembly. TEP has recently trained the scouts in the 'event book' system of monitoring wildlife populations used in Namibia's community conservancies (Stuart-Hill et al, 2005). This will provide data on wildlife trends at the village level, which will, in turn, provide valuable information on the impact of community conservation measures in Terrat and may also help to mitigate human-wildlife conflict. This also represents the piloting of community-based wildlife monitoring in Tanzania, where almost all data is collected at large spatial scales by government wildlife authorities.

The Terrat easement has been in place for about 2.5 years now. It has provided a formal mechanism for communities to protect approximately 9,300 ha of critical habitat on the Simanjiro plains and an incentive to work towards preventing illegal use of wildlife in this area. It provides a formalization of traditional land use patterns and rules which effectively serve as a barrier, protecting the Simanjiro plains from the expanding agricultural frontier coming from Arusha to the north. The easement places a financial value on the ecosystem services (the maintenance and conservation of wildlife habitats) that traditional livestock and land management practices provide in Simanjiro. The easement therefore provides a model for correcting the 'market failure' which drives wildlife declines in East Africa, whereby wildlife valuable over large scales

(e.g. to the national tourism industry) is not valuable to local communities, which effectively manage the habitats of conservation importance. The easement impacts conservation across the Simanjiro Plains both by formally protecting a large area of the plains and by providing incentives for communities to improve local protection of wildlife, which is traditionally treated as an 'open access' resource. This local protection is illustrated by the work of the village game scouts, who use mobile phones to communicate with other anti-poaching forces (such as hunting companies and Tarangire National Park game scouts) and have arrested several groups of poachers.

The village has received 15 million Tshs to date, investing the bulk of these funds in primary school construction in one sub-village, as well as a new secondary school in Terrat village center. Although the total annual communal revenues from the easement, at about \$4,500, are relatively small in relation to the total support for social services that the village receives from other sources (such as the District Council and charitable NGOs), the easement funds are one of the few sources of discretionary revenues received by the village government. This amount of village revenue, although small, gives community governance institutions greater flexibility to support new or existing development projects. It also contributes to the development of local governance institutions as the community must collectively decide how to allocate and spend these revenues. Individual benefits are received by the four village game scouts, whose salaries of \$50 per month, while modest, are nevertheless significant in a context where monthly per household cash expenditure is only around \$10, and opportunities for employment are highly limited.

The initiative enjoys broad local support, although it has faced one notable obstacle, a conflict between Terrat village and one farmer who is a former village council member. This farmer, an Iraqw (Mbulu ethnic group) immigrant to the area but a long-time resident, has a large farm (several hundred acres) in the northern part of the easement area, along the Terrat-Loiborsoit border. The farmer claims that he was given the land by neighboring Loiborsoit village, and therefore Terrat has no authority to remove him. Terrat has since re-affirmed their village boundaries, obtained a Certificate of Village Land (as required by the Village Land Act of 1999), and involved government land officers in clarifying the location of the surveyed boundaries. Terrat has also removed the farmer from membership of the village council. Nevertheless, the village has not succeeded in removing his farm from the ease-

ment area and is currently pursuing enforcement strategies, including both: a) physical destruction of his crops; and b) initiation of legal proceedings. This demonstrates an additional benefit of the easement (beyond enhancing existing land use practices)- to provide formal incentives for the village to secure the boundaries of the easement area and confront sources of encroachment.

Beyond the immediate conservation and financial impacts at the village level, an equally important outcome of the Terrat easement is the emergence of a new, locally-acceptable, and cost-effective (approximately \$.48/ha) framework for wildlife conservation on village lands in Simanjiro. While the Terrat easement is, to a large degree, identical to the framework for village-operator tourism concessions in nearby parts of Simanjiro, the financing of the Terrat agreement is quite different. As a result of the generally good reputation of the easement agreement in Simanjiro, neighboring Sukuro village seems likely to agree to adopt a similar arrangement to cover its portion of the Simanjiro plains in 2008. Two of the operators involved in the Terrat deal<sup>7</sup> have also recently initiated dialogue with another village to the north of Tarangire National Park in Monduli District. In addition, Emboreet, while not yet embracing an easement on their portion of the plains, has appointed six village game scouts which UCRT is overseeing.

The potential for these easements, or 'conservation concessions', to spread throughout the system in the next few years offers a realistic framework for reconciling community interests with conservation objectives and spreading the local-level incentives for conservation that the future of the Maasai Steppe ecosystem's wildlife populations depend on.

## Lessons Learned

### *Creative Collaboration*

The Terrat easement arose from a collaborative effort among a diverse set of conservation, tourism, and rural development interests, all of whom were searching for solutions to patterns of wildlife population decline and continued conflicts over land and natural resource management in Simanjiro (e.g., between tourism and hunting companies, and villages and central government). The easement emerged because those collaborators recognized that existing institutional constraints, such as the reticence of the Tanzanian government to implement the 1998 wildlife policy and decentralize management to the local level, demanded creative new mechanisms for channeling benefits to communities if the decline

<sup>7</sup> Dorobo Tours and Tarangire Safari Lodge.

of wildlife outside protected areas was to be halted. The collaborators also recognized that existing community-based conservation efforts in Simanjiro were fundamentally top-down and not sufficiently based on local livelihood interests and land tenure concerns.

The impact of the Terrat easement cannot be fully measured by the area set aside by the village or the financial returns to the community. The easement's more important impact is the establishment of a framework for community-based conservation that brings together local community, private sector, and conservation interests. The easement has forged common ground and produced a working example of community-based conservation in an environment that has been characterized by conflict between local communities and wildlife conservation for most of the past thirty years. The easement has resulted in new organizational relationships and common aims which provide essential human and organizational capital for scaling up further collaborations and community-based conservation efforts throughout the Maasai Steppe. The establishment of collaborative relationships and mutual understanding is a key outcome of the easement experiment, and is potentially much more important than its immediate ecological and economic impacts.

The easement has also leveraged other forms of external support for community-based conservation in Simanjiro, mainly through collaboration between TEP and UCRT. TEP not only funds the village game scouts' salaries, equipment, and monitoring training, but it also funds additional activities carried out by UCRT to support natural resource management in Terrat, such as the surveying and formalization of village land rights. In 2007, the resources invested in the area by TEP amounted to about \$11,000, and, if the program expands to Sukuro village, this number is expected to increase to \$30,000 as land use planning is carried out as a precursor to an easement there. Thus, the operators' financing of the easement contract itself has leveraged additional resources which support community-level conservation activities in Simanjiro, and has also helped cement the collaboration between TEP and UCRT. This collaboration, in turn, provides a range of services supporting the easement itself and absorbs most of the transaction costs associated with the deal.

### *Local Champions*

It is worth emphasizing that in the case of the Terrat easement, as in so many other innovative conservation or development pro-

jects, businesses, or social movements, a handful of key individuals and organizations played a pivotal role. In particular, the long-term experience of Dorobo Tours and its directors in Emboreet village, and the Maasai Steppe more generally, was absolutely indispensable. Dorobo brought extensive experience with community-level negotiations, collaborative processes, and deep social and ecological knowledge of the region to the initiative. Equally, UCRT is a uniquely skilled facilitator of community-based natural resource management in Simanjiro, and northern Tanzania more broadly. The organization had key contacts with local political elites in Terrat which were vital to introducing the idea of the easement in a suitable manner and ensuring it was not perceived as a conservationist 'land grab'. Without these two unique organizations, the easement idea would not have gotten off of the ground, and scaling it up further in Simanjiro is heavily dependent on their skills, relationships, commitment, and resources.

### *PES on the Margin*

Wunder (2007) notes that PES arrangements will often be "best suited to scenarios of moderate conservation opportunity costs on marginal lands and in settings with emerging, not-yet-realized threats." In Terrat, the key to the easement's successful implementation is the fact that it built on traditional livestock-based livelihoods and the incentives that the community already possessed for limiting the expansion of agriculture into grazing lands. Because the community had already worked to limit agriculture's spread onto the plains, adoption of the easement incurred very low opportunity costs. The easement serves to bolster the community's incentive to limit the future spread of agriculture into the plains and restrict agricultural cultivation to other parts of the village which are less important habitats for wildlife and livestock. The easement therefore serves to increase the marginal benefits of livestock versus agriculture as a local land use choice on the plains, by enabling the community to capture additional economic benefits from wildlife as a complement to pastoralist livestock production.

In Emboreet, by contrast, land farmed on the plains is estimated to be bought and sold for up to \$350/hectare. However, as Sachedina (2006) describes, cultivation of the plains in Emboreet is also driven by that village's fears that their land will be taken over by conservation interests; hence the 'defensive' strategy to cultivate and displace wildlife. A key lesson that emerges is that the local economic opportunity costs which PES agreements need to be based on are shaped not only by theoretical land values or pro-

ductive potentials, but by political economic factors as well. The short-grass plains in Emboreet and Terrat have the same nominal productive potential for agriculture, but the different social and political contexts in the two communities result in very different relative land use patterns and valuations at the village level.

### *Adaptive Strategies and 'Muddling Through'*

The social, institutional, and ecological complexity of a large and variable ecosystem such as the Maasai Steppe is considerable. Conservation strategies and interventions can only be effectively developed by: a) improving practitioners' understanding over time of how and why social and ecological change is occurring (e.g. Nelson, 2005); and b) experimenting with new approaches that can be monitored and themselves used as opportunities for learning. Such an adaptive approach- or as Lindblom (1959) called it, 'muddling through'- focuses on gradually making iterative progress towards an ultimate goal, but recognizes that strategies to reach that goal must be altered as both surprises and learning occur.

The 'muddling through', or adaptive management approach, aptly describes the process that led to the emergence of the Terrat easement. By 2004/05 there was a nascent effort among a core group of experienced collaborators to devise alternative strategies for creating community-level incentives to conserve wildlife on the Simanjiro plains. However, it was not until the unforeseen ELAND proposal that the impetus was given to crafting and implementing an operational land easement initiative. The ELAND initiative produced both a danger (the threat of increased suspicion of external conservation interests at the local level) and an opportunity, by bringing a group of tour operators together and initiating a collective dialogue of the conservation challenges in the ecosystem. Thus, both threat and opportunity catalyzed the core group of collaborators to re-shape the ELAND proposal into an operational PES scheme, which was experimentally piloted in Terrat village.

Opportunism and adaptive management are continuing throughout the process of learning, experimentation, and on-the-ground progress. Dorobo Tours and Tarangire Safari Lodge, with UCRT facilitating at the village level, have recently begun to explore options for initiating an easement similar to the Terrat deal with another village on Tarangire's northern border. Expanding an easement agreement to this different locale was not planned in advance, but rather a dialogue arose between an operator and village leaders serendipitously, and the operators are pursuing what may be a valuable opportunity to secure more land for conserva-

tion in a cost-effective, locally-driven manner. Importantly, it is the past experience and collaborative relationships built by the Terrat easement that makes this opportunistic expansion possible. It is the ability to adaptively seize opportunities and learn from past experiences which allows conservation practitioners to effectively 'muddle through' the challenges inherent in working in complex and ever-changing social-ecological systems.

### ***PES as a Model for Community-based Conservation***

A key lesson from the experience of the easement is that PES can provide a simple and highly cost-effective model for community-based conservation of wildlife and wildlife habitats outside state protected areas. In savannah ecosystems, where wildlife regularly ranges far outside protected area boundaries, finding effective mechanisms and incentives for communities to promote wildlife habitat as a form of land use is a critical issue. In eastern Africa, wildlife populations are widely declining as a result of the lack of local economic incentives for conservation (Norton-Griffiths, 2007). For example, the Loita plains wildebeest population of Kenya's Maasai Mara system declined by over 80% from the mid-1970s to mid-1990s, largely as the result of conversion of communal rangelands to farming and fenced individual properties (Homewood et al., 2001). PES arrangements such as the Simanjiro easement may provide an alternative framework for creating local incentives for wildlife conservation in contexts where alternative sources of economic incentives (e.g. tourism revenues) are not sufficient.

In Tanzania, the easement model would appear to be widely suitable for protecting key dispersal areas and migration corridors outside state protected areas. It is important to emphasize the cost-effectiveness of the easement framework in Simanjiro, in a context where millions of dollars have been spent on promoting community-based conservation to limited effect. This supports arguments that PES may be more efficient and effective than alternative methods for integrating conservation with rural development such as so-called integrated conservation-and-development projects (ICDPs) (see Ferraro and Kiss, 2002). However, it is also important to highlight the complimentary nature of the Simanjiro easement and other community-based conservation models, such as village-private ecotourism ventures; these different models are not zero-sum options but should be promoted according to context and practical challenges and opportunities.



### *Future Challenges*

Several notable challenges face the Terrat easement moving forward.

The easement arose because Tanzanian wildlife management institutions have failed to put in place a legal and policy framework that encourages community-based conservation, based on local capture of wildlife's economic value, on village lands. Conflicts between central wildlife authorities and local communities, particularly over the matter of hunting concession allocations on village lands, continue in Simanjiro. The Terrat easement has operated as a direct contract between private operators and the village, supported by a range of NGOs. It has not involved either district or central government agencies, which was a deliberate strategy. Conflicts between the village and higher levels of government over land tenure and resource use remain a challenge for conservation practitioners in the Simanjiro area. The easement could be undermined by central appropriation of village lands in the Simanjiro plains, which has been a threat to the communities for over twenty years, or by continued inflammation of local attitudes towards wildlife by top-down conservation initiatives by government or external NGOs.

Another challenge is financial. The tour operators who are the contracting parties to the easement are, in a way, subsidizing the benefits captured from Tarangire's wildlife by a much broader range of interests. These include other private operators, but particularly government agencies such as TANAPA, which earns millions of dollars from park gate fees and lodge concessions. The operators note that an underlying assumption of the Terrat initiative since its inception has been that by catalyzing a successful model for conservation on village lands, their financial contributions to the easement would be able to leverage external conservation funding to expand the model to other villages, or even perhaps take over the financial support of the Terrat easement. While the operators' investment has been able to leverage significant additional resources, mainly through the TEP support to UCRT which underpins the easement's administrative costs and the village game scouts' activities, it remains unclear how willing the operators will be to scaling up their existing level of financial contributions. Mechanisms for scaling up the easement model using other sources of funding, such as a long-term endowment raised by conservation interests, have not been delineated, and the overall financial strategy for scaling up the easement to other villages has not been clearly articulated. This will be a key area for future

collaborative efforts in the ecosystem to address in order to successfully build off of the catalytic experiences of Terrat. Acknowledgements

This work was supported by the United States Agency for International Development (USAID) through the Leader with Associates Cooperative Agreement, No.EPP-A-00-06-00014-00. The contents of this report are the responsibility of the author and do not necessarily represent the views of USAID. The author worked on developing the Simanjiro easement from 2004-2005 while Tanzania program director for the Sand County Foundation Community Based Conservation Network, with the generous support of the Bradley Fund for the Environment.

## References

Baldus, R.D. & Cauldwell, A.E. (2004) Tourist hunting and its role in development of wildlife management areas in Tanzania. Paper presented to the Sixth International Game Ranching Symposium, Paris, July 6-9, 2004.

Borner, M. (1985) The increasing isolation of Tarangire National Park. *Oryx*, 19, 91-96.

Dorobo Tours and Safaris and Oliver's Camps Ltd. (1996) Potential models for community-based conservation among pastoral communities adjacent to protected areas in northern Tanzania. In N. Leader-Williams, J. Kayera, and G. Overton (eds.), *Community-based Conservation in Tanzania*. Occasional Paper of the IUCN Species Survival Commission No. 15. IUCN, Gland, Switzerland.

Ferraro, P.J. & Kiss, A. (2002) Direct payments to conserve biodiversity. *Science*, 298, 1718-1719.

Homewood, K.M. & Rodgers, W.A. (1991) *Maasailand Ecology: Pastoralist Development and Wildlife Conservation in Ngorongoro, Tanzania*. Cambridge University Press, Cambridge, UK.

Homewood, K., Lambin, E.F., Coast, E., Kariuki, A., Kikula, I., Kivulia, J., Said, M. Serneels, S., & Thompson, M. (2001) Long-term changes in Serengeti-Mara wildebeest and land cover: Pastoralism, population, or policies? *Proceedings of the National Academy of Sciences*, 98, 12544-12549.

Igoe, J. (2004) *Conservation and Globalization: A Study of National parks and Indigenous Communities from East Africa to South Dakota*. Wadsworth/Thomson Learning, Belmont, CA, USA.

Igoe, J. and Brockington, D. (1999) *Pastoral Land Tenure and Community Conservation: A Case Study from North-east Tanzania*. Pastoral Land Tenure Series. International Institute for Environment and Development, London, UK.

Kahurananga, J. (1981) Population estimates, densities and biomass of large herbivores in Simanjiro Plains, northern Tanzania. *African Journal of Ecology*, 19, 225-238.

Lindblom, C.E. (1959) The science of muddling through. *Public Administration Review*, 19, 79-88.

Masara, Y. (2005). *Wildlife Areas Expansion and Local Land Rights: The Case of Kimotorok Village, Simanjiro District*. Unpublished report, Pastoralists Indigenous Non Governmental Organization's Forum, Arusha, Tanzania.

Nelson, F. (2007) *Emergent or Illusory? Community Wildlife Management in Tanzania*. Drylands Issue Paper No. 146. International Institute for Environment and Development, London, UK.

Nelson, F. (2005) *Social and Ecological Dynamics and Complexity in the Simanjiro Plains: A Roundtable Discussion*. Tanzania Natural Resource Forum, Arusha, Tanzania.

Nelson, F. (2004) *The Evolution and Impacts of Community-based Ecotourism in Northern Tanzania*. Drylands Issue Paper No. 131. International Institute for Environment and Development, London, UK.

Norton-Griffiths, M. (2007) How many wildebeest do you need? *World Economics*, 8, 41-64.

Sachedina, H. (2008) *Wildlife is Our Oil: Conservation, Livelihoods and NGOs in the Tarangire Ecosystem, Tanzania*. PhD thesis, University of Oxford, UK.

Sachedina, H. (2006) Conservation, land rights and livelihoods in the Tarangire Ecosystem of Tanzania: Increasing incentives for non-conservation compatible land use change through conserva-

tion policy. Paper presented to: Pastoralism and Poverty Reduction in East Africa: A Policy Research Conference, Nairobi, Kenya.

Stoner, C., Caro, T., Mduma, S., Mlingwa, C., Sabuni, G., Borner, M. & Schelten, C. (2007) Changes in large herbivore populations across large areas of Tanzania. *African Journal of Ecology*, 45, 202-215.

Stuart-Hill, G., Diggle, R., Munali, B., Tagg, J. and Ward, D. (2005) The event book system: a community-based natural resource monitoring system from Namibia. *Biodiversity and Conservation*, 14, 2611-2631.

Wunder, S. (2007) The efficiency of payments for environmental services in tropical conservation. *Conservation Biology*, 21, 48-58.



# TRANSLINKS

A partnership of NGOs, Universities and USAID led by The Wildlife Conservation Society, dedicated to finding and sharing practical ways to generate benefits from conserving natural resources that are of global importance, and that serve as the supermarkets, bank accounts and insurance for many of the poorest people on earth.

For more information please visit our website at [www.translinks.org](http://www.translinks.org) or contact Dr. David Wilkie, the program director, at [dwilkie@wcs.org](mailto:dwilkie@wcs.org).



Land Tenure Center



This publication is made possible by the generous support of the American people through the United States Agency for International Development (USAID), under the terms of the TransLinks Cooperative Agreement No.EPP-A-00-06-00014-00 to The Wildlife Conservation Society. TransLinks is a partnership of WCS, The Earth Institute, Enterprise Works/VITA, Forest Trends and The Land Tenure Center, The contents are the responsibility of the authors and do not necessarily reflect the views of USAID or the United States government.