

1. Title

Community-Based Management and Conservation in Africa

2. Authors

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3. Abstract

The overall goal of the case study is to help students understand some of the challenges and tradeoffs inherent in natural resource management in a developing world context. The students will learn about these topics in the context of three communities in Namibia in which real events have been observed and documented. These communities are centrally located within a large, transboundary conservation area (Kavango-Zambezi Transfrontier Conservation Area - KAZA), which is managed by five countries with the goal of conserving wildlife and natural resources while improving human well-being. Students learn about a complex socio-environmental system from biophysical, socio-economic and cultural viewpoints and are introduced to the basic governance and management structure characteristic of these communities. Emphasis is placed on a multi-scalar (top-down and bottom-up) understanding of this system as it relates to globalization, coupled human-environment interactions and trade-offs and synergies between conservation and development. Specifically, students will engage in a simulation activity in which they decide whether or not to relocate their respective community, balancing declining rain-fed agricultural production with an increasing need to conserve charismatic megafauna in Namibia. The case was created for introductory or mid-level conservation, wildlife and conservation, or environmental sociology courses but it may also be appropriate for various geography courses and seminars. A PowerPoint file is also available as supporting material for the case study.

4. What course(s) is this case appropriate for?

This case study is appropriate for environmental conservation, environmental sociology, conservation and development; natural resources management, or globalization.

5. What level is this case appropriate for?

The level for this case study can be introductory, middle and upper division undergraduate; upper division high school. It may be adapted to include more or less detail depending on the level it is used for.

6. SES Learning Goals- This case study addresses the following broad learning goals:

1. Ability to describe a socio-environmental system, including the environmental and social components and their interactions
2. Ability to develop research questions and conceptual models in an interdisciplinary team.
 - Gain perspective on different ways of knowing and understanding the value of different knowledge sources.
3. Ability to consider the multi-scalar aspects of socio- environmental systems
 - Understand that ecological and social processes often vary across differing

contexts, including space, time, and conditions (e.g. economic or political).

7. Topical Areas/Keywords:

Conservation and Development

Multi-scale resource management (spatial, temporal, governance)

Coupled human-environment interaction

Cultural perceptions of conservation/wildlife and land use management

Global North - South power dynamics, globalization

Community-based decision-making

8. Introduction/Background

Our story follows a young man who is about to attend a community meeting at which the fate of his family's settlement is to be decided. He is unsure of the right path, but his father does not want to move and his brother is optimistic that the move will improve their lives.

This exercise would ideally be administered in mid-course, because a baseline understanding of natural resource management issues in a developing world context would be helpful for their comprehension of the role-playing activity.

Teaching Objectives:

1. Analyze a complex local issue from an integrated socio-environmental perspective.
2. Understand that decisions and actions at different scales affect outcomes in remote, small villages in southern Africa.
3. Examine trade-offs and synergies between development and conservation in lesser-developed nations.
4. Use data and information from disparate points of view to inform decision-making.
5. Understand different cultural perceptions of natural resources.

9. Classroom Management

This case study includes decision-making simulation, small and large-group discussion, and either an interrupted design or problem-based learning depending on the time allotted.

This activity is designed to take two teaching hours. The first hour will be devoted to introducing the topic and role-playing in which groups of students have to assume the role of the villagers who must decide whether to move their settlements and agricultural plots away from a nearby river or keep them in the same location. The second hour will be devoted to showing the students what actually happened in the area they are simulating and having a discussion about the trade-offs and synergies between conservation and development and the different types of factors that must be considered in conservation management decisions. If the class is a 3-hr block class, this can all be done in one day (with the extra time allotted to the journaling portion), but if one is teaching in 50 or 75-minute periods, this should be spread out into two periods (with the journaling occurring between classes).

First hour:

1. Students are told that they are going to simulate a real-world decision about natural resource management in Namibia.
2. Before the activity begins, students are given index cards and told to write down their names and their answer to the question: “Do you think conservation and development are mutually exclusive?” The instructor collects these cards once students fill them out (can also be done electronically if preferred). These cards will be revisited after the exercise and discussion (5 minutes).
3. Instructor shows students a map of the Caprivi region, gives a brief background on KAZA (power point available and can be modified based on available time), and tells students that they will be taking the perspective of villagers who need to make a decision about what to do with their settlement in light of new conservation policies in the region (5 minutes).
4. Instructor reads first-person story about a village family about to go to the community meeting to help give them more detail on the villager perspective (5 minutes).
5. Instructor splits students into “villages” of 4-5 students each. The students are tasked with making the collective decision, acting as a community, to either continue living and farming near the river, or to move their settlement away from the river. One person within each village is assigned the role of Traditional Authority (TA), and the whole group is told that while the group is to consider the decision collectively, the TA must make the final decision. Each group is given a village name, a map of the area they live in, and an agenda for the village meeting which outlines the decision to be made, as well as a cost-benefit matrix and some details about the specific area in which they live. We have three different village descriptions that can be used for any number of groups (and if two groups get the same information that adds a comparative element to their decision-making process). (15 minutes).
6. Once a decision is reached in a group, the TAs will come forward and write their decisions on the board and briefly explain how the group made their decision (10 minutes).
7. In the remaining class time, the instructor will explain the homework assignment: The students will write individual or group (depending on class size) essays in which they summarize the decision-making process of their group, weighing the different information and coming to a decision. They will also be asked to reflect on their personal experience of the decision-making process, including whether they thought the TA made a fair decision and whether they thought they had enough information to come to a solid decision.

Second hour:

The second hour will be focused on a continuation of the simulation (adaptive management), reflection of the decision-making process and how this relates to larger-scale political and biophysical properties.

1. Students will first be asked to go back to their “villages”
2. Now that they have reflected on the process, students will discuss the following questions:
 - a. Did you feel like your process of decision-making appropriately weigh the types of information you were given?

- b. Did you have any doubts about the decision that your group came to?
 - c. What other types of information did you wish you had to help you make a decision? (10 minutes)
3. Once the students have discussed these questions, the instructor tells them that this is an adaptively managed system and they have the option of changing their decision. Specifically, an NGO has arrived to conduct fieldwork in the region and has brought with them new information. The groups are each given a new handout including “NGO facts” - the NGO has information from larger scales (time, space, political) that could possibly influence their decision.
4. The students discuss the new information and whether it leads to a different decision on what to do with the village (15 minutes)
5. Once they make their new decision, the TA will again come up and write down whether their decision stayed the same or changed based on this new information.
6. Once the decisions are in, the instructor will show the class what really happened in this region to the villages that made these decisions. (5 minutes)
7. The instructor will lead a discussion with the entire class using the following discussion questions:
 - a. In what ways do you think the process we went through together is similar to what a village might undergo?
 - b. How is this process different? (this can bring in cultural, economic, lifestyle, relational differences)
 - c. What do you think are the costs and benefits to community-based natural resource management vs. a more top-down approach?
 - d. What are some of the global mechanisms that connect these types of processes in villages in Namibia to your own life here in the United States?
 - e. Generally speaking, why should it matter to this class how villages in Namibia decide to manage their land? (15 minutes)

The final assignment (to be completed at home) is to give the students back their cards they filled out at the beginning of the case study and have them write another essay/journal entry about whether their perception of the mutual exclusivity of conservation and development changed as a result of simulating the decision-making experience (5 minutes).

10. Blocks of Analysis

Conservation and Development

The lack of sustainable development potential of cattle and agricultural systems has been a stimulus for many southern African countries to examine wildlife utilization as an alternative development tool. While countries have taken different strategies, the ultimate goal of the various policy approaches is to capture wildlife’s biophysical and economic advantage to generate a continuous stream of benefits to local communities. In doing so, incentive exists for the conservation of wildlife and the ecosystems across the migratory ranges of different species.

In 1996 Namibia adopted legislation to allow communities to engage in wildlife resource management through the establishment of conservancies. Studies (1) have demonstrated wildlife’s economic advantage at the national and regional levels in generally increasing

revenues from wildlife-based tourism. However, questions remain in regards to understanding the actual benefits of wildlife conservation at the community level. If wildlife viewing and hunting tourism is to be a sustainable source of revenue and also create incentives towards conservation of wildlife and natural resources of local environments, then understanding how institutional factors affect local benefit attainment is key, as it is the local inhabitant who will ultimately make the decision to plant another row of crops, pasture more cattle, poach another animal, or conserve for future benefit.

Human-environment interaction at different scales

Coupled human-environment (H-E) systems identify complex couplings between humans and natural aspects of a system across space, time, and organizational units (2). Scale and measurement are necessary considerations when studying these interactions due to the complex nature of nonlinear dynamics and feedbacks within the system. When considering human population and the environment, Zaba and Clarke think of scale as a “nested hierarchy of population-environment relationships” (3). Within this hierarchy, different factors influence different levels. Zaba and Clark’s literature review shows that at a macro-level, studies tend to focus on population growth as the primary problem in environmental degradation, whereas at micro-scales the economic and social factors take a more prominent role. According to Ajaegbu (4), not all scales are created equal; he argues that the local level is where the primary interplay and processes really function, but this is the scale at which the least amount of data is available. For example, household decision-making and per capita use have often been considered primary drivers of land change, but data linking the household or the individual to the environment is hard to produce (5, 6). Additionally, spatial variability may often provide the best insight into local drivers and direct connections between variables, but the resolution of data sources can vary widely, with data often only available in highly aggregated forms, such as county-level data, which fails to provide insights into spatial dynamics of coupled H-E linkages (6).

It is the continuous interaction and exchanges between people and the natural system that creates complex feedbacks, which contribute to the difficulties of modeling a coupled H-E system (7). For example, negative feedbacks can alleviate stress on the system. where environmental migration relieves pressure on origin resources and allows both the humans and resources left behind to stabilize (7). Positive feedbacks can amplify destructive properties in a H-E system, with one example being people migrating away from environmental degradation which can further disrupt the local economies from which they exited, leading to famine in the area of out-migration and heavy reliance on aid (8). The feedbacks can also be unpredictable, or mixed, as is the case where environmental degradation leads to displacement, powerlessness, and then conflict. Conflict is shown in the literature to sometimes improve the environment (via lack of development/infrastructure) and sometimes degrade it (in the case with deliberate tampering with resources) (7, 9). Suhrke (9) provides several examples of areas where outcomes were wildly different depending on the local context and specific nature of the environmental aggravation. Additionally, environmental variables also feed into other environmental variables, not just population; for example, soil quality and topology interact with agricultural productivity, which affects land use patterns. With the environment *and* population contributing to environmental change, the feedbacks become quite complicated. Similarly, population can have effects on both population and environment (10), and humans can have positive and negative impacts on the exact same variable; for example, there is evidence that humans diminish

biodiversity in many respects, but there is also evidence that our use of the environment increases biodiversity (11).

Conservation Narratives

The two extreme environmental narratives identified in conservation and development literature constitute the ends of a spectrum. On one end, scientists believe humans harm biodiversity, so the most effective way to meet biodiversity goals is to prohibit local people from using conservation areas (12, 13). This “biocentric” view has been countered on the other end by the “anthropocentric” narrative, which argues conservation can have a deleterious effect on local populations when they are not meaningfully included in the management and use of protected areas (14, 15). The center of the spectrum can be considered the “pragmatist” view. This group acknowledges the flaws on both sides and takes a more neutral problem-solving approach (16).

In the developing world, most scholars agree biocentric narratives entered the political scene first (17). The enthusiasm for biodiversity conservation came mostly at the heels of Rachel Carson’s *Silent Spring*, which opened the world’s eyes to the destruction brought by industrialization (18). At this point, biologists and other scientists began to argue nature had to be preserved untouched, because in the face of development pressures, there was no telling what kinds of devastation could occur to precious little remaining biodiversity. Additionally, Ehrlich’s *Population Bomb* and Hardin’s *Tragedy of the Commons*, both published in 1968, stoked the global fear that our natural resources would be exhausted in only a few short decades, leaving human communities in resource-depleted chaos (19, 20). This general global fear also coincided with a “crisis narrative” that surfaced regarding developing countries, which described collapsed societies and a chaotic environment, further fueling fears natural resources in faraway places were being gobbled up indiscriminately and no one was caring about or even keeping track of the devastation (21).

In many developing countries the move to conserve natural areas was a direct transition from colonial protectionism. Natural areas had been protected by colonial powers as game reserves and national forests, which were completely restrictive land designations towards native citizens, either prohibiting use or, even worse, displacing their communities. These protected areas easily transitioned into places of biological preservation with the element of human exclusion preserved (22). A widespread belief emerged that local people exclusively served detriment to the natural landscape, and thus the only way to keep flora and fauna populations from collapsing was to set aside land to be entirely free of humans. This type of conservation became known as “fortress conservation” (23). Fortress conservation was also closely aligned with a top-down management approach, as it is rooted in an authoritarian model that “science knows best” (24). At the basic level, this governance model is the political manifestation of the biocentric narrative. While it certainly can be interpreted on some level as a type of racism, more fundamentally there was a genuine belief among these scientists that not just foreign people, but people in general, had caused the biodiversity crisis. Additionally, from a practical standpoint, the developed world had both less biodiversity remaining and less to begin with (25). This philosophy helped decision-makers justify not only the protection of natural areas from development, but also the displacement of millions of people, creating animosity towards biodiversity conservation so acerbic it sometimes turned violent (26).

The idea of anthropocentric values in the conservation arena came primarily as a response to the often oppressive neocolonial environmental politics of the 1960s and 70s. While classical economic theory and traditional poverty alleviation strategies place little value on the

environment, the anthropocentric narrative in the conservation arena values the environment *via* human needs. Essentially, this narrative's goal is twofold: first, it seeks to correct the injustice of top-down, oppressive environmental management, and second, it aims to highlight the interconnectivity of environmental conservation and quality of life for humans. While this view remains anthropocentric in that its main goal is to ensure the health of humans, it suggests that human communities and natural areas will fare better if conservationists include local people in land management decisions and permit them to use nearby natural resources for sustainable livelihoods. Concern for the human environment produces a win-win situation for the environment *and* humans in this narrative (27). This narrative is tied closely with the environmental justice movement, because environmental justice strategists are informed and driven by these same value paradigms (28). However, while environmental justice focuses primarily on removing environmental harms from disadvantaged human communities, the narrative in the conservation arena addresses more broadly the interaction of human communities and biodiversity preservation.

This narrative facilitated a shift in the international community to an emphasis on community-based management, livelihood strategies, economic viability of protected areas (via tourism, primarily) in the 1980s and 1990s (29). Where governments in developing countries could once depend on international financial and political support to restrict human use in natural areas, the funding opportunities switched into more integrated human development programs. These funding structures serve as legitimizing forces, so the funding shifts represented a change in the dominant narrative, which reveals the success of the anthropocentric narrative in defining itself as a "solution" to the failed policies of protectionism.

Community-based conservation/management

In response to substantive backlash to the fortress-based conservation model of the 60s and 70s, community-based management emerged in order to more meaningfully include local communities in conservation projects. This has been argued for based both on justice and effectiveness; in other words, it is both important to include people because it is their right to sit at the table, and because conservation projects are considered to have better chances of meeting their conservation goals when human communities are meaningfully included in conservation project design and management.

However, this idea that one may simply bring locals to the table has been problematic in practice. For example, when local people are put in charge of managing local resources, they may not receive actual control; instead they may simply be given nominal roles within a top-down managerial plan (17). The question to consider in this case is, "if the local community decided they wanted firewood and not a forest, would they be given that right?" It can be easily argued that community-based management does not empower communities as much as it includes humans in management decision-making, *not* the decision to conserve. While there are many examples of this inclusion leading to more sustainable management of the protected area, at the same time, this strategy often fails to completely inspire a sense of empowerment among local people (30). These community-based efforts typically fail to capture the local power dynamics, which can lead to misrepresentation of the community itself (31). Many also question whether the local communities have either the capacity or the will to manage natural resources; the desire to have local communities manage resources again originated in the western anthropocentric narrative context, and not as a locally-produced phenomenon (32).

Multi-scale resource management (spatial, temporal, governance)

The Kavango-Zambezi Transfrontier Conservation Area (KAZA TFCA) is an important socio-ecological system in southern Africa. The area is both regionally important for conservation efforts that cross national boundaries and locally important for its perennial water sources and charismatic wildlife, the basis for increasing conservation-based tourism that benefits local communities. The region possesses one of the largest free ranging populations of elephants in Africa, to whom the three perennial rivers constitute a critical source of water (33). Moreover, most human settlement occurs along these water courses, particularly along rivers in the Caprivi Region (20,000 km²) of Namibia (34), thereby increasing human wildlife conflicts during the dry season (35).

Land-use decisions and adaptive management of natural resources as well as development initiatives must incorporate information on climate variability of the regional watershed scale as well as local-scale vegetation dynamics. The upper catchment is characterized by Miombo woodland, while the lower is of a more mixed composition of tree-shrub-grass and includes a sub-parallel system of drainage lines (Omirumbas) that run along a NW-SE gradient (36). Precipitation decreases north-south from over 1000 mm to less than 500 mm. Kalahari sandveld characterizes a large portion of the region's soil and subtle variations in vegetation type traverse a gradient that corresponds to the N-S rainfall regime.

11. Assessment

The students will be graded on the two essays they will be asked to complete as a part of the case study process (see classroom management). The instructor may also assign a grade for participation based on how much engagement they observe during the discussion periods of the exercise.

Table 1. Cost-benefit matrix providing rationale for students to discuss in their small groups.

	Move settlement away from river	Don't move, stay near river
Costs	<ul style="list-style-type: none">- moving takes a lot of energy- it's harder to get water to the fields further from the river- the soils tend to be richer near the river- more boreholes would need to be drilled and they are expensive- moving into more upland areas displaces families and cemeteries :)- increased clearing of vegetation for farming (slash-and-burn agriculture) and loss of proximate grazing grounds for livestock	<ul style="list-style-type: none">- risk of flooding is higher- elephants and other wildlife would continue to pose increasing risks (crop raiding, human deaths and injuries from contact with wildlife)- reduces the amount of benefits that can be obtained from trophy hunting and tourism- inhabitants maintain exclusive reliance on rain-fed farming- settlements closest to the river are most marginalized (farthest from the main road)

Benefits	<ul style="list-style-type: none"> - risk of flooding is lower - leaving more space for wildlife reduces human-wildlife conflicts and allows space for wildlife to access additional water points - lodge operators have more access to picnic/wildlife-viewing grounds on boat safaris - newly-cleared fields higher in soil nutrients (temporarily, in any case) - shorter walk to woodland resources for firewood extraction or other resources - opportunity to develop a community campsite for more independent tourists or other community-based ecotourism small businesses 	<ul style="list-style-type: none"> - soil is richer, water is more readily available for agriculture and other uses - do not have to rebuild infrastructure, move - easier access to edible river plants (water lilies), building materials (reeds, papyrus), fishing and short-distance boat transportation - maintain traditional land uses, not giving into external pressure from local NGO and lodge and safari operators
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Criteria for decision-making at village level:

Physical:

1. Gradient of soil types (sandier to north transitioning into more clayey soils to the south, also more clayey closer to the river)
2. Proximity to river, roads, parks, other land uses (Bwabwata and Mudumu, as well as the state forest reserve)

Infrastructure

1. Number of boreholes in communities as a function of distance from the river
2. Number of settlements and inhabitants in each
3. Location of lodges and other tourism infrastructure

Social

1. Composition of household income sources: subsistence farmers vs. family members employed in eco-tourism, other conservancy and NGO-related jobs, government jobs, remittances and so on.

12. Additional Case Study Options

1. Introduce a non-governmental organization (NGO) representative to the small group discussions. This person would be given additional information to the group about the larger regional initiatives regarding KAZA and conservation of wildlife. The perspective would be from an advocacy position- as in, “this NGO comes into your village and tells you they think you should move” - so this might either get people to defer to authority or become defiant.
2. An “expert” climate/hydrologist/water-something scientist who has study regional hydro-metrological patterns has been invited to the meeting to talk to the villagers about

projections over the next 10-20 years regarding river flows, rainfall... something along these lines... An example would be to inform locals that it will be much drier most years but when it rains there will be intense flooding along river front...

13. References

1. Naidoo R, *et al.* (2011) Effect of Diversity of Large Wildlife Species on Financial Benefits to Local Communities in Northwest Namibia. *Environmental and Resource Economics* 48(2):321-335.
2. Liu J, Ouyang Z, Tan Y, Yang J, & Zhang H (1999) Changes in Human Population Structure: Implications for Biodiversity Conservation. *Population and Environment: A Journal of Interdisciplinary Studies* 21(1):45-58.
3. Zaba B & Clarke J (1994) Introduction: Current directions in Population-Environment Research. *Environment and Population Change*, eds Zaba B & Clarke J (Derouaux Ordina Editions, Liege, Belgium).
4. Ajaegbu HI (1995) Local community approach to the study of population-environment interrelationships and disharmony: the relevance for Africa. *Population-Environment-Development Interactions*, eds Clarke JI & Tabah L (CICRED, Paris, France).
5. Cruz MCJ (1996) Management Options for Biodiversity: Issues in Population-Environment Dynamics. *Human Population, Biodiversity, and Protected Areas: Science and Policy Issues*, ed Dompka V (American Association for the Advancement of Science, Washington, DC).
6. Evans TP & Morgan EF (2002) Spatial Integration of Social and Biophysical Factors Related to Landcover Change. *Population and Development Review* 28(Supplement):165-186.
7. Richmond AH (1995) The environment and refugees: theoretical and policy issues. *Population Bulletin of the United Nations* 39:1-17.
8. Akokpari JK (1998) The State, Refugees and Migration in Sub-Saharan Africa. *International Migration* 36(2):211-234.
9. Suhrke A & Hazarika S (1993) *Pressure points: Environmental degradation, migration and conflict* (American Academy of Arts and Sciences, Cambridge, MA).
10. McIntosh A (1993) Population Policy and Environmental Impacts in Rural Zimbabwe. *Population-Environment Dynamics: Ideas and Observations*, eds Ness GD, Drake WD, & Brechin SR (The University of Michigan Press, Ann Arbor).
11. McNeely JA & Ness G (1996) People, Parks, and Biodiversity: Issues in Population-Environment Dynamics. *Human Population, Biodiversity, and Protected Areas: Science and Policy Issues*, ed Dompka V (American Association for the Advancement of Science, Washington, DC).
12. Mashalla SK (1988) The human impact on the natural environment of the Mbeya Highlands, Tanzania. *Mountain Research and Development* 8(4):283-288.
13. Terborgh J (1992) Maintenance of Diversity in Tropical Forests. *Biotropica* 24(2):283-292.
14. Bezemer D & Headey D (2008) Agriculture, development, and urban bias. *World Development* 36(8):1342-1364.
15. Dasgupta S, Deichmann U, Meisner C, & Wheeler D (2005) Where is the poverty - Environment nexus? Evidence from Cambodia, Lao PDR, and Vietnam. *World Development* 33(4):617-638.
16. Rey Benayas JM, Bullock JM, & Newton AC (2008) Creating woodland islets to reconcile ecological restoration, conservation, and agricultural land use. *Frontiers in Ecology and the Environment* 6(6):329-336.

17. Brown K (2002) Innovations for conservation and development. *The Geographical Journal* 168(1):6-17.
18. Carson R (1962) *Silent Spring* (Houghton Mifflin, Boston).
19. Ehrlich PR (1968) *The Population Bomb* (Ballantine Books, New York).
20. Hardin G (1968) The Tragedy of the Commons. *Science* 162(3859):1243-1248.
21. Rocheleau DE, Steinberg P, & A. BP (1994) *A Hundred Years of Crisis? : Environment and Development Narratives in Ukambani, Kenya*. (African Studies Center Boston University, Boston, MA).
22. Homewood K (1995) Development, demarcation, and ecological outcomes in Maasailand. *Africa* 65(3):331-350.
23. Cernea MM & Schmidt-Soltau K (2006) Poverty Risks and National Parks: Policy Issues in Conservation and Resettlement. *World Development* 34(10):1808-1830.
24. Frank DJ, Hironaka A, & Schofer E (2000) The nation-state and the natural environment over the twentieth century. *American Sociological Review* 65(1):96-116.
25. Myers N, Mittermeier RA, Mittermeier CG, da Fonseca GAB, & Kent J (2000) Biodiversity hotspots for conservation priorities. *Nature* 403(6772):853-858.
26. Holmes G (2007) Protection, Politics, and Protest: Understanding Resistance to Conservation. *Conservation and Society* 5(2):184-201.
27. Archabald K & Naughton-Treves L (2001) Tourism revenue-sharing around national parks in Western Uganda: early efforts to identify and reward local communities. *Environmental Conservation* 28(2):135-149.
28. Pezzullo PC & Sandler R (2007) Revisiting the Environmental Justice Challenge to Environmentalism. *Environmental Justice and Environmentalism*, eds Pezzullo PC & Sandler R (MIT Press, Cambridge, Mass.).
29. Barnes JI, MacGregor J, & Weaver LC (2002) Economic efficiency and incentives for change within Namibia's community wildlife use initiatives. *World Development* 30(4):667-681.
30. Adam MC & Kneeshaw D (2008) Local level criteria and indicator frameworks: A tool used to assess aboriginal forest ecosystem values. *Forest Ecology and Management* 255(7):2024-2037.
31. Igoe J & Croucher B (2007) Conservation, Commerce, and Communities: The Story of Community-Based Wildlife Management Areas in Tanzania's Northern Tourist Circuit. *Conservation and Society* 5(4):534-561.
32. Terborgh J (2000) The Fate of Tropical Forests: a Matter of Stewardship. *Conservation Biology* 14(5):1358-1361.
33. Craig C (1997) The ELESMAF project. ed Foundation NN (Namibia).
34. O'Connell-Rodwell CE, Rodwell T, Rice M, & Hart LA (2000) Living with the modern conservation paradigm: can agricultural communities co-exist with elephants? A five-year case study in East Caprivi, Namibia. *Biological Conservation* 93(3):381-391.
35. Chase MJ & Griffin CR (2009) Elephants caught in the middle: impacts of war, fences and people on elephant distribution and abundance in the Caprivi Strip, Namibia. *African Journal of Ecology* 47(2):223-233.
36. Thomas DSG, *et al.* (2000) Dune activity as a record of late Quaternary aridity in the Northern Kalahari: new evidence from northern Namibia interpreted in the context of regional arid and humid chronologies. *Palaeogeography Palaeoclimatology Palaeoecology* 156(3-4):243-259.

