

## Conservation in Africa: exploring the impact of social, economic and political drivers on conservation outcomes

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## Environmental Research Letters



## EDITORIAL

## Conservation in Africa: exploring the impact of social, economic and political drivers on conservation outcomes

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## Introduction

Sub-Saharan Africa (SSA) houses some of the globe's most valuable biodiversity—including charismatic megafauna, a great diversity of birds, endemic plants and ecological processes. But it also remains one of the most economically impoverished regions of the planet, introducing significant social, political, and economic challenges to conserving biodiversity while enhancing human well being.

Much of the conservation effort in Africa has focused on biological diversity through the establishment of parks and protected areas to house endangered or valuable species. More recently, the efforts in SSA have begun to focus on ecosystem services—the goods and services (such as, e.g., clean water, disease regulation, sacred places) ecosystems and their resident species can deliver to humans. Many of the most significant impacts on biodiversity and ecosystem services, however, or from domains and influences not traditionally explored or addressed by the conservation community. This special issue of *Environmental Research Letters* focuses on the social, economic, and political drivers of conservation outcomes in Africa, with a particular focus on sub-Saharan Africa. It explores the status of conservation in Africa, and examines how long-term environment and human-environment interactions can shape biodiversity distributions and conservation outcomes with emphasis on how institutions (governance); private investment (e.g., mineral exploitation, trade in ivory); foreign investment (aid, poverty alleviation); the status of women; wealth and wealth inequality; urbanization; civil conflict; and climate change can affect conservation outcomes in Africa.

## Why Africa?

## Biodiversity

Ecologically, Africa entered the Anthropocene with comparatively modest Quaternary extinctions, and

thus with its ecological communities relatively intact (Klein 1984). This has resulted in a rich diversity of habitats that support a significant variety of plant and animal life. Wildlife is not distributed uniformly across the continent but follows patterns of geography, climate, vegetation, faunal barriers, Pleistocene refugia and anthropogenic transformations of the landscape.

Overall vegetation distribution shows a core of humid evergreen forests in the tropical zone of the Congo basin, Guinea coast and eastern Madagascar, whilst deserts prevail across North Africa and in SW coastal Africa. Between these extremes, vegetation grades from woodlands to savanna to arid scrub. This pattern is enriched by large rift valley lakes, rivers and wetlands as well as high mountains and plateaus.

The distribution of different species reflects factors of geographic isolation, radiations and refugia. The plants themselves show ancient phytochoria with high levels of endemism in regions of past floral radiation (White 1983). Overall plant richness at species, genus and family level is lower than that of other tropical areas. The African mainland has between 40 000 and 60 000 plant species, of which approximately 35 000 are endemic (Mutke and Barthlott 2005). Aquatic life shows great richness and endemism in isolated lakes and large river systems. Insects, birds and primates are best represented in the forest regions whilst ungulates and large carnivores are primarily distributed in savanna areas. Many rare endemics are confined to isolated montane regions. Other species, such as the African elephant, have a broader habitat use and are widespread across the continent. One quarter (1229 species) of the world's approximately 4700 mammal species occur in Africa, including about 960 species in sub-Saharan Africa (SSA) and 137 species in Madagascar alone. More than 2000 bird species occur there, constituting more than a fifth of the approximately 10 000 bird species in the world (de Klerk *et al* 2004). About 1600 bird species are endemic to SSA (de Klerk *et al* 2002). (See UNEP 2011, Programme, U. (2011).

Biodiversity in Africa. Retrieved from <http://www.eoearth.org/view/article/150570>, for graphical representations of biodiversity in Africa). Many important food crops originate in Africa, including several species of millet and sorghum, one species of rice, the grain crop teff, and the oil palm.

### **Parks and protected areas**

Africa remains one of the poorest regions on earth, and it attracts numerous well-intentioned Western governments, international banks, conservation organizations, and other institutions and individuals seeking to address the continent's urgent needs. Conservation remains one of the most visible and contentious areas of contact between Africa and the West (Myers *et al* 2000, Fjeldsa *et al* 2004, Burgess *et al* 2004). The effort to 'save' Africa's natural heritage has been seen as an unquestionable good, if not a moral duty for the developed world. The methods conservationists have often used, most often establishing protected areas and putting armed rangers in the field, date from the early colonial era but remain important tools.

The approach to establishing protected areas has remained relatively unchanged over the last 40 years. The process has involved removing people living on land identified for protection—in almost all cases, the result is a protected area surrounded by people who were excluded from the planning of the area, have limited understanding of its purpose, derive little or no benefit from its creation, and hence do not support its existence. As a result, there is significant distrust of park authorities by rural Africans living in close proximity to conservation areas, in part because of the lack of attention those authorities, supported by conservationists, have traditionally paid to the link between ecology, the survival of wildlife, and the livelihoods of displaced people (McShane and Wells 2004).

### **Cultural diversity**

No discussion of biodiversity in Sub-Saharan Africa would be complete without taking into account the human linguistic and cultural diversity of the continent. There are, by some counts, over 3000 languages in Africa as a whole, though a more reasonable estimate might be around 2000 languages (Heine and Heine 2000, Epstein and Kole 1998). This linguistic diversity mirrors the regions cultural diversity. Fearon (2003) constructed an index of cultural diversity in early 1990 in 160 countries (43 in SSA), using information on ethnicity and distance among language groups. Of the top 30 most diverse countries, 23 are in Sub-Saharan Africa. This ethnic, linguistic, and cultural diversity encompasses a broad spectrum of human-environment interactions, and values and preferences with regards to the natural world and conservation. It can also challenge decision-making. The relatively arbitrary national borders in Africa,

deriving primarily from decisions made by the European powers during the period of colonialism and driven by resource and access strategies rather than tribal or cultural affiliations, further exacerbate this challenge.

### **Population/urbanization**

At the beginning of the 20th century, the total population of Africa was about 118 million, accounting for 7.4% of the global population (United Nations Population Division 1996). From 1980 to 2000, it grew from 469 to 798 million, representing 13 per cent of the world population in 2000 (FAO 2003). By 2020, the urban population is expected to be 646 million, up from 302 million in 2000 (FAO 2003). While insufficient data exists to accurately ascertain the magnitude of urbanization, available statistics indicate a current rate of urbanization in Africa of around 3.5 per cent per year (UNCHS 2001). This rate is the highest in the world, and is resulting in the rapid growth of urban agglomerations throughout the region. By 2030, the proportion of Africa's urbanized population is expected to reach 53.5 per cent, compared to 39 per cent in 2005 (WRI 2005). This relatively high rate of urbanization places strain on infrastructure and other services.

### **Poverty**

Pervasive poverty and social inequities remain major constraints to sustainable development in Africa. Poverty is both a cause and an effect of environmental degradation. The equitable, efficient and productive use of natural resources offers important opportunities for sustainable livelihoods that can contribute to reducing poverty.

Poverty is multidimensional: it is more than just the lack of access to financial resources—even though income is the most commonly used indicator of poverty—and material resources. It includes the lack of capabilities that enable a person to make choices to live a life that she or he values (Sen 1999). This includes access to income, health, education, empowerment and social inclusion, and human rights. Poverty may be synonymous with powerlessness, with a lack of access to information, institutions and voice. There is considerable variation among poor people and the extent to which they are disempowered. This is affected by various factors including gender, location (urban or rural), culture and ethnicity.

The United Nations Development Programme regularly measures the development of a country through the Human Development Index (HDI)—an index that captures health and longevity, knowledge and education, and standards of living. The HDI was calculated for 187 countries in 2014 (<http://hdr.undp.org/en/data>), 47 of these in Sub-Saharan Africa. Not a single SSA country is ranked in the top quartile for HDI, and only two (Mauritius and Seychelles, both

island nations distinct from continental Africa) fall in the top half. Of the 47 countries in the bottom quartile, 38 are from sub-Saharan Africa. This relative deficit in health, education, and financial resources challenges both efforts to improve human wellbeing and livelihoods, and conservation efforts.

SSA is further impacted by significant levels of corruption that challenge decision-making and governance. Transparency International calculates a 'Corruption Perception Index' (CPI) each year, measuring public-sector corruption based on expert opinion. A CPI of 100 would represent zero corruption (the highest scoring nation in 2014, Denmark, received a 92). The average score for Sub-Saharan Africa was 33 (the high in Botswana with 63 and a low in Somalia with 8)—comparable with Eastern Europe and Central Asia, and half the score of The European Union and Western Europe (<https://www.transparency.org/cpi2014/results>).

### Education, knowledge and information

Knowledge and access to information are essential for effective environmental management and have significant impacts on the economy and the livelihood choices people make. Indigenous knowledge systems based on centuries of observation and continually developed in response to changing social and environmental conditions are an important resource for many rural people. This knowledge base offers opportunities not only for conservation but also for the use and commercialization of wild resources.

The adult literacy rate is 67 per cent for people above 15 years of age (WRI 2005), with women having a higher illiteracy rate compared to men (WRI 2005). There is considerable variation between literacy rates in African countries, with Zimbabwe having 90 per cent adult literacy, Morocco 50.7 per cent and Burkina Faso 12.8 per cent (UNDP 2005). Improved literacy increases the capacity of people to communicate and to be reached through the electronic and print media, the capability to effectively participate in their communities and in broader governance issues, and provides new opportunities to engage effectively in the productive sector and the market.

### Economics & trade

Although in 2000 Africa accounted for 13.6 per cent of the world population, its gross domestic product (GDP) was just under 1.7 per cent of the world's GDP (UNDP 2005). For SSA, GDP per capita, using purchasing power parity (PPP), amounted to US\$1856 compared to the average for countries with high human development of US\$25 665 (UNDP 2005) This is significant for commerce, savings and investment growth rates as well as resources available to governments and individuals, making them more reliant on the natural resource base for their basic needs. The GDP per capita (PPP) across the region varies

considerably, with Equatorial Guinea having an average GDP per capita of US\$19 780, South Africa US\$10 346 and Sudan US\$1910 (UNDP 2005).

Inequity within a particular country is clearly important for how benefits are shared. Unequal growth remains a major challenge for Africa—income distribution is highly skewed, with 40 per cent of the population receiving only 11 per cent of income, while the richest 20 per cent gets 58 per cent of income (FAO 2003). Income inequality is particularly evident across the urban-rural divide (World Bank 2005).

Export of natural resources remains a major factor in the economies of many countries. Instability and adverse price trends drive countries to exploit more resources to meet their domestic and foreign obligations, including debt servicing, at the expense of long-term sustainability of the resources. Africa's economies are more reliant on agriculture than those of any other region, with around 70 per cent of Africans working in the agricultural sector (FAO 2003). About three-fifths of African farmers are subsistence farmers tilling small plots of land to feed their families, with only a minimal surplus that can be sold. Although agriculture employs 56.5 per cent of Africa's total labour force (FAO 2004), it contributes only 14 per cent of GDP, and much of the recent growth in agricultural GDP is the result of foreign direct investment (FDI), driven by the needs of investor nations for food and biofuels.

With respect to manufacturing, Africa is the world's least industrialized region. Despite large local supplies of cheap labour, almost all of the region's natural resources are exported elsewhere for secondary processing. The lack of value-adding activities means that the full potential from natural resources is not being earned within African countries. Only about 15 per cent of employment is generated by the manufacturing sector. Industrial sector restructuring and reform measures have led to a collapse of industries in some countries and hence the declining share of manufacturing to the total economy. While industrial development offers important opportunities, it also creates certain risks, particularly in the management of pollution and human health.

A key response to the poor performance of the formal sector has been the diversification and intensification of informal sector activities as people try to make ends meet. Many of these activities are based on natural resources and include carpentry and craft production, charcoal manufacturing, collection and trade of non-timber forest products, artisan mining, and metal works.

Without doubt, addressing conservation and development in Africa is more sophisticated now than it was twenty-five or even five years ago. There have been significant efforts to more directly involve communities in conservation along with a greater focus on conservation outside of national parks (Hulme and Murphree 2001, McShane and Wells 2004). Our

growing understanding of the linkages between conservation and other social, economic and political factors, however, has introduced greater complexity into the process of seeking solutions to conservation. While anthropologists have been coming to an understanding of the relationship between people and the land, and economists have developed new models of natural resource utilization, their work remain marginal to much of mainstream conservation thinking. In this special issue we explore many of the social and economic factors that will have to be considered if conservation of biodiversity in Sub-Saharan Africa is to be successful.

## References

- BirdLife International 2004 *Action for Birds and People in Africa. The conservation programme of BirdLife International Africa Partnership* (Cambridge: BirdLife International) pp 2004–8
- Burgess N, D'Amico Hales J, Underwood E and Dinerstein E 2004 *Terrestrial Ecoregions of Africa and Madagascar: a Conservation Assessment* (Washington: Island Press)
- de Klerk H M, Crowe T M, Fjeldsa J and Burgess N D 2002 Biogeographical patterns of endemic terrestrial Afrotropical birds *Diversity and Distributions* **8** 147–62
- de Klerk H M, Fjeldsa J, Blyth S and Burgess N D 2004 Gaps in the protected area network for threatened Afrotropical birds *Biological Conservation* **117** 529–37
- Epstein E L and Kole R (ed) 1998 *The Language of African Literature* (Trenton, NJ: Africa World Press) p ix
- FAO 1997 *The State of Food and Agriculture 1997* (Rome: Food and Agriculture Organization of the United Nations (FAO))
- Fearon J 2003 Ethnic and cultural diversity by country *Journal of Economic Growth* **8** 195–222
- Fjeldsa J, Burgess N D, Blyth S and de Klerk H M 2004 Where are the major gaps in the reserve networks for Africa's mammals? *Oryx* **38** 17–25
- Heine B and Heine B (ed) 2000 *African Languages: an Introduction* (Cambridge: Cambridge University Press)
- Hulme D and Murphree M (ed) 2001 *African Wildlife and Livelihoods: The Promise and Performance of Community Conservation* (Portsmouth: Heinemann)
- Klein R G 1984 Mammalian extinctions and stone age people in Africa *Quaternary Extinctions* ed R B Martin and R G Klein. (Tucson, AZ: University of Arizona Press)
- McShane T O and Wells M P (ed) 2004 *Getting Biodiversity Projects to Work: Toward More Effective Conservation and Development* (New York: Columbia University Press)
- Mutke J and Barthlott W 2005 Patterns of vascular plant diversity at continental to global scales *Biologische Skrifter* **55** 521–37
- Myers N, Mittermeier R A, Mittermeier C G, da Fonseca G A B and Kent J 2000 Biodiversity hotspots for conservation priorities *Nature* **403** 853–8
- United Nations Environment Programme (UNEP) 2011 *Biodiversity in Africa* (<http://eoeearth.org/view/article/150570>)
- White F 1983 *Vegetation of Africa—a descriptive memoir to accompany the Unesco/AETFAT/UNSO vegetation map of Africa Natural Resources Research Report No. 20* United Nations Educational, Scientific and Cultural Organization, Paris