



A PLATFORM FOR STAKEHOLDERS IN AFRICAN FORESTRY

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POLICY BRIEF

CLIMATE CHANGE AND WILDLIFE RESOURCES IN EAST AND SOUTHERN AFRICA

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Wildlife in the national park of Nakuru in Kenya

THE CHALLENGE

In Africa, most of the wildlife species are found in grasslands and open woodlands or savannas that are estimated to cover about 13.4 million km² or 60% of the continent. The protection of biodiversity in Africa is closely associated with protected areas. Protected areas (6,390 in all) cover about 2.4 million km² (World Resources Institute, 2003) representing about 11% of total area in eastern Africa and 14% in central southern Africa and 16% in south western Africa. Apart from their biodiversity significance, the major uses of wildlife resources in East and southern Africa are ecotourism, safari hunting and local hunting. In most wildlife-rich areas, local people may be heavily dependent on the wildlife resource as a source of bush meat and income.

Currently evidence suggests that the climate in eastern and southern Africa is warming at

a rate of 0.25 - 0.5 °C per decade. Common effects of climate change on species and ecosystems include (i) changes in the timing of life-history events or phenology, (ii) effects on demographic rates, such as survival and fecundity, (iii) reductions in population size, and (iv) shifts in species distribution ranges. In the case of wildlife, food availability and ambient temperature are the ultimate causes of seasonal breeding in all mammals and the proximate causes in many (Bronson, 2009).

A POLICY SOLUTION

Temperature extremes can impose limits directly through the physiological tolerances of the species. For example, it has been observed that larger herbivores reduce their activity with increasing temperature, but because they are forced to feed during all hours of the day they are thus susceptible to thermoregulatory constraints during foraging as compared to small herbivores (Du Toit and Yetman, 2005). Climate warming is

Over 65% of the original wildlife habitat in Africa has been lost (Kiss, 1990) as a result of agricultural expansion, deforestation, and overgrazing, which have been fueled by rapid human population growth and poverty. As a result, protected areas are becoming increasingly ecologically isolated while wildlife on adjacent lands is actively eliminated (Newmark and Hough, 2000). Invasive alien species pose additional dangers to biodiversity in protected areas in east and southern Africa.

In spite of the above threats to wildlife resources, a number of opportunities exist to improving the management of these resources, including the involvement of local communities in management, transboundary cooperation and enforcement of international agreements.

likely to have more negative effects on large than small herbivores. The abundance of the African lion is also, to a significant extent, influenced by climate factors, such as rainfall and temperature. However, rainfall, more than temperature, appears to regulate aspects of reproduction in most dry tropical African mammals. Extreme events, such as droughts, have been observed to delay onset and reduce synchrony of calving and birth rates, while high rainfall advanced onset and increased synchrony of calving and birth rates in some African ungulates (Ogutu et al., 2010). Surface water also strongly constrains the distribution and abundance of large herbivores during the dry season (Chamaillé-Jammes et al., 2007), while juvenile survival of most ungulates in Kruger National Park, South Africa, was sensitive to annual variability in rainfall, especially in the dry season. Also rainfall affected adult survival in several species that were in a population decline phase (Owen-Smith et al., 2005).

EXISTING POLICIES

Both droughts and herbivory (including fire) contribute to the shift in the current balance between woody and grassy habitats in east and southern Africa. This has implications for the future abundance of the browsers and grazers in wildlife conservation areas.

Modeling studies have shown that mammals in African National Parks will experience changes in species richness due to climate change, while effects of global climate and land use change on wildlife communities are predicted to be most noticeable, not as a loss of species from their current ranges but as a fundamental change in community composition (Thuiller et al., 2006).

Relationships between the geographical distributions of birds and present climate have been modelled for species breeding in both Europe and Africa, and the results suggest that there is likely to be a general decline in avian species richness. Also species' potential geographical distributions are also likely to decrease (Huntley et al., 2006). These observations cast doubts on the future effectiveness of networks of protected areas under projected 21st century climate change. Shifts in species' distributions could mean that these areas may cease to afford protection to wildlife species for which they were originally established.

The Call to Action

The most commonly used adaptation strategies to deal with impacts of climate change in the wildlife sector include artificial provision of water, expansion of protected areas to include migration corridors and seasonal feeding areas, and improving connectivity of habitats to facilitate dispersal to appropriate habitats.

However, in future it will be important to incorporate predicted climate change impacts into overall wildlife management plans, and to review and modify existing laws, regulations and policies regarding wildlife management. In addition, consideration should be given to managing protected areas for climate change mitigation through carbon storage and sequestration, as well as for other ecosystem services.

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- Protected areas (6,390 in all) cover about 2.4 million km² representing about 11% of total area in eastern Africa and 14% in central southern Africa and 16% in south western Africa.
- Grasslands and open woodlands or savannas are estimated to cover about 13.4 million km² or 60 per cent of the African continent
- Total number of wild ungulate species in African woodlands and savannas is estimated at 98 species
- The richest assemblages contain more than 30 large herbivore species
- Endemic wildlife species: 52 bird and 72 mammal endemic species in East Africa and 50 bird and 65 mammal endemic species in southern Africa

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