POLICY BRIEF

RESPONSES TO CLIMATE CHANGE IN THE WILDLIFE SECTOR IN AFRICA

Africa is home to the most diverse animal life on the planet. Although wildlife has economic significance, particularly in the tourism sector, it is also a key element of the ecosystems that underpin the productivity and stability of African societies and livelihoods. But wildlife is increasingly under threat from interlinked changes in land use and climate. To respond effectively to climate change, existing approaches to wildlife management should be strengthened with additional monitoring and dynamic modelling. At the same time, wildlife management and climate change must move into the mainstream of national and international planning and policy processes.

Introduction

Wildlife in Africa symbolizes the extraordinary biodiversity of the continent, but faces many challenges. These include habitat loss, excessive hunting and poaching, and extermination of wild animals that threaten agriculture. But climate change is perhaps the greatest challenge of all. Although relatively little is known about how increasing temperatures and higher incidence of extreme climate events will affect wildlife, it seems certain that there will be a profound impact on populations and species distribution.

Raising the profile and influence of wildlife management and climate change in national planning processes is key to reducing the biodiversity loss which threatens to permanently destabilize African ecosystems.

Establishing effective climate change adaptation strategies requires that scientists, managers and policy makers work together to identify climate-sensitive species and ecosystems and assess the likelihood and consequences of impacts. Such scientific information should form the foundation of climate change adaptation strategies in the wildlife sector.

What does the wildlife sector need to respond to climate change?

▸ Better understanding of the effects of climate change on wildlife populations and species distribution, based on long-term monitoring and dynamic ecological modelling.

▸ Improved communication and knowledge management within the sector.

▸ A better relationship between internationally agreed frameworks and national planning agendas, to effectively mainstream climate change.

▸ Inclusion of wildlife in National Adaptation Programmes of Action (NAPAs).

But information alone will not be enough. Climate change is a cross-cutting issue, touching every economic sector and area of government activity. It demands special institutional and governance arrangements. Yet climate change planning is usually coordinated by institutions that are responsible for agriculture or the environment, which are often politically weak and lack capacity. Wildlife management is often an even more marginalized sub-sector.

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Wildlife in transition: what do we need to know?

The extent of biodiversity in tropical Africa is illustrated by the fact that its flora contains more than 7,000 species of trees and shrubs. At least 75 per cent of these are browsed, supporting 765 species of mammals, ranging from 587 with a body mass of less than 5 kg to 16 with a body mass greater than 300 kg.

This rich diversity, concentrated in savannas and tropical forests, has been under threat from changes in land use and management for decades. Cycles of human population growth, agricultural expansion, deforestation and overgrazing have led to significant habitat loss. Surveys carried out in the1990s suggested that 65 per cent of original wildlife habitat had already disappeared. Wildlife

has been further threatened by overexploitation through hunting and poaching.

Despite the economic and ecological importance of wildlife, relatively little is known about how it will be affected by climate change. It is likely however that climate warming and increased droughts and floods will have an impact on demographics, population sizes and species distribution. These effects may include:

▶ alterations to the range of different species;
▶ fundamental changes in the composition of species communities;
▶ changing patterns of disease;
▶ changing patterns of life history traits such as mortality and fecundity.

65 per cent of original wildlife habitat has already disappeared

Deforestation and wildlife habitat loss through slash and burn agriculture and charcoal making, Republic of Congo (Courtesy N'danikou Sognigbe)

Asking what will happen to wildlife leads to questions about the impact of climate change on the grasses, trees and water on which it depends. How will the distribution of plant species be affected? How will the function of river basins change? How will the hydrological cycle respond? These and other complex ecological questions are difficult to answer. But methods for responding to them are crucial if the wildlife sector is to respond effectively to climate change.

Monitoring and modelling

Successful responses to climate change in the wildlife sector depend on monitoring and recording changes in climate and in the distribution and abundance of wildlife species. Once this data is collected, relationships between population dynamics and climate variables can be assessed and future scenarios modelled.

Climate is monitored at a network of meteorological observation stations across Africa. Although the network is not dense and stations suffer from a lack of resources, some data are collected to monitor atmosphere, oceans and terrestrial systems. Annual Regional Climate Outlook Forums in East, West and Southern Africa are held to analyse these data and generate and disseminate seasonal forecast information (UK Met Office 2012).

The wildlife sector currently lacks the necessary capacity and resources to monitor change in wildlife. Nonetheless, tools have been developed which could be relatively easily adapted and linked to existing climate monitoring to provide the kind of data needed to predict the impact of climate change on wildlife (see box).

Combined ecological and climate monitoring would produce information which could be fed into dynamic models. These use data to replicate processes of change over time, rather than relying on statistical analysis of data from the past to predict the future. They are now being used to predict the effects of different climate change scenarios on ecosystem variables with increasing accuracy.

Table 1 shows an example of the predictions that this kind of research can make. Scientists combined information from the Africa Mammals Databank with climatic simulations derived from the HadCM3 dynamic climate model. This allowed them to develop predictions for species change in African national parks in 2050 under two different scenarios for greenhouse gas emissions, developed by the International Panel on Climate Change.

Adapting ecological monitoring to the African wildlife sector

Ecological monitoring, developed around 1990, could be easily adapted to integrate the monitoring of climate change and its impacts on African wildlife. This would require establishing a representative sample of protected areas for wildlife, defining indicators of biodiversity parameters and establishing regular data collection. This monitoring system could then be connected to existing regional networks of meteorological stations.

Data would be collected on community composition, migration trajectories of key species and changes in the abundance of endemic species. In Europe, biodiversity monitoring relies on indicator species such as butterflies. In Africa, this could be based on species threatened by human pressure and those that are sensitive to climate variations.

It is also important to recognize that although climate plays a significant role in determining species distribution, other variables such as human population density, land use and soils are also important. Data on human populations and changes in land cover and use should also be collected.

Table 1. Projected species change at 2050 in selected African national parks under two climate change scenarios, produced using the HadCM3 climate model and IPCC Special Report Emissions Scenarios.

Park	Biome	Current species	IPCC SRES Scenario A2, 2050			IPCC SRES Scenario B2, 2050		
			Species loss	Species gain	Turnover	Species loss	Species gain	Turnover
Kalahari	Desert and xeric shrubland	45	25	6	- 19	23	7	- 16
Etosha	Flooded grasslands and savanna	80	22	14	- 8	18	13	- 5
Mount Kenya	Montane grasslands and savanna	50	18	25	7	12	26	14
Serengeti	Tropical grasslands and savanna	120	7	6	- 1	6	3	- 3
Salonga	Tropical moist broadleaf forests	80	36	28	- 7	20	25	5

Source: Adapted from Thuiller et al. (2006)

Integrating knowledge in policy and planning

Creating new knowledge about the impact of climate change on wildlife is an important first step in building appropriate adaptation strategies. But how can such knowledge be effectively used in planning, policy and ecosystem management?

Within the wildlife sector, more efficient communication links between stakeholders are needed to promote awareness of the relationship between climate change and wildlife conservation. This requires strengthening existing knowledge networks to share information both within and beyond the wildlife sector, and strengthening the knowledge base of protected area management.

Climate change should be mainstreamed in national planning agendas. Efforts to achieve this centre around mechanisms derived from international climate change agreements. The principal tools for mainstreaming are National Communications (NCs), which form the basis for developing NAPAs.

NCs are intended to assess a country's vulnerability to climate change and develop scenarios that model potential climate change impacts. Despite support programmes to build knowledge management capacity, they seldom include combined ecological and climate monitoring and modelling. Some NAPAs include proposals related to land use management, soil conservation, erosion control, forestry and agroforestry – but few refer to wildlife.

Recommendations

Developing more effective responses to climate change in the wildlife sector demands a foundation of research to monitor change, improved integration of science and policy, and advocacy for the mainstreaming of climate change and wildlife. This agenda means:

▶ including climate change and wildlife monitoring and dynamic modelling modules at wildlife training centres and universities;
▶ enhancing technical capacity to assess, plan and integrate adaptation needs into sectoral development plans;
▶ expanding NAPAs to include wildlife, to ensure that wildlife and biodiversity needs are considered as an integral part of the broader social climate change adaptation process.

Furthermore, given the complexity of relationships between wildlife and other ecosystem components, consideration should be given to current approaches to wildlife conservation, which place a strong emphasis on protected areas. These areas can be viewed not only as safe havens for wildlife, but also as sites of biodiversity conservation and carbon sinks. These functions are all necessary components of adapting to and mitigating climate change. Consideration should therefore be given to managing protected areas for climate change mitigation through carbon storage and sequestration, as well as for wildlife conservation. This would further reinforce the need to bring both wildlife and climate change to the centre of current development agendas.

Source

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