

### Context

There is mounting evidence of catastrophic declines in the number and range of wildlife populations worldwide. Rapid human population growth, land-use changes, land fragmentation, infrastructure development, shortages of water and pasture, governance and poverty have all been blamed for the fall.

In Kenya, 70% of wildlife lives outside protected areas and shares grazing lands and water sources with livestock. Kenya's population has also increased from 8 million in the 1960s to 47.2 million in 2016. The country's rangelands are currently home to almost one-third of its population, most of which consists of pastoral communities that practise extensive grazing. The livestock sector contributes around 12% to national Gross Domestic Product; tourism contributes about 10%.

In the last 20 to 30 years, the privatisation of pastoral and communal lands has increased, which has led to changes in land use from grazing to agriculture or urban development. These changes, along with climate variability, are piling enormous pressure on both pastoralists and wildlife, groups that once used to thrive together.

### Aims

We analysed the links between climate and changes in wildlife and livestock numbers, land use and ownership, and human population to assess the success of pastoral livestock production, wildlife management, and conservation policies in Kenya's arid and semi-arid rangelands. The aim of this assessment is to understand what has happened to wildlife and livestock numbers over the last 40 years and to provide targeted policy recommendations for both sectors.

Our analysis is based on the long-term monitoring of information on livestock and wildlife numbers collected using light aircraft by Kenya's Directorate of Resource Surveys and Remote Sensing. We modelled wildlife and livestock numbers in Kenya's 21 rangeland counties to investigate whether species are increasing or declining. The population size of each wildlife species was linked to rainfall, temperature, livestock densities, and whether they live inside or outside protected areas.

Pathways to Resilience in Semi-arid Economies (PRISE) is a five-year, multi-country research project that generates new knowledge about how economic development in semi-arid regions can be made more equitable and resilient to climate change. PRISE aims to strengthen the commitment of decision-makers in local and national governments, businesses and trade bodies to rapid, inclusive and resilient development in these regions. It does so by deepening their understanding of the threats and opportunities that semi-arid economies face in relation to climate change.

Where we work: Senegal, Burkina Faso, Kenya, Tanzania, Ethiopia, Pakistan, Tajikistan and Kyrgyzstan.

Member organisations: Overseas Development Institute, UK (lead organisation); Grantham Research Institute for Climate Change and the Environment, UK; Innovation Environnement Développement en Afrique, Senegal; Sustainable Development Policy Institute, Pakistan.

Country Research Partners: Regional Environmental Center for Central Asia, Tajikistan; University of Ouagadougou, Burkina Faso; Kenya Markets Trust, Kenya; Mountain Societies Research Institute, Kyrgyzstan.

### PRISE research projects:

Research area 1: Migration futures in Asia and Africa: climate change and climate-resilient economic development.

Research area 2: Migration, remittances, adaptation and resilience in arid and semi-arid regions of Senegal and Tajikistan.

Research area 3: Harnessing opportunities for climate-resilient economic development in semi-arid lands: adaptation options in key sectors.

Research area 4: Enabling environment for private sector/multi-stakeholder action to strengthen resilience to climate change.

Research area 5: Property rights, investments and economic development in the context of climate change in semi-arid lands.

Research area 6, Part 1: Cross-boundary multi-scale governance of semi-arid lands: Implications for climate resilience and economic development.

Research area 6, Part 2: Resilience to climate-related shocks and stressors in Kyrgyzstan: developing resilience indicators to predict well-being.

Research area 7: Water governance in semi-arid lands: political and economic insights for the management of variability and extremes in a changing climate.

## Results

- There was a striking increase in sheep, goat and camel numbers between 1977 and 2016. Over the same period, there was a fall in the numbers of 14 out of the 18 common wildlife species throughout Kenya's 21 rangelands counties. Sheep and goat numbers increased by 76%, camels by 13% and donkeys by 7%. Cattle numbers dropped by 27%. These falls occurred mainly in northern Kenya's rangelands, which have suffered recurring droughts over the last 20 years. To adapt to droughts, pastoral communities have invested in keeping more sheep, goats and camels. The decline in cattle population is worrying; Kenya has a meat shortage, and a consistent fall in livestock numbers threatens supply. PRISE researchers in Project 3, which is exploring options for climate-resilient beef value chain transformation, are developing ways to support pastoralists, butchers and livestock markets.
- Between 1977 and 2016, the average fall in population for the 18 common wildlife species was 68%. Warthog and waterbuck numbers each fell by 88%, Grevy's zebra by 86%, hartebeest by 84%, impala by 84%, topi by 82%, eland by 78%, oryx 78%, Thomson's gazelle by 75%, lesser kudu by 72%, Grant's gazelle by 70% giraffe by 67%, gerenuk by 69% and wildebeest by 64%. Burchell's zebra numbers dropped by 30%, buffalo by 37%, elephant by 42% and ostrich by 43%.
- Wildlife numbers increase in areas less densely populated with livestock, as livestock graze on tall grasses while many species of wildlife prefer more nutritious short grass (which also helps them avoid becoming prey). However, in spite of this, very high livestock numbers still compete with wildlife overall.

## Policy recommendations

- The sharp decline in most of Kenya's wildlife populations provides compelling evidence that an urgent and far-reaching review of the implementation of wildlife management and conservation policies is long overdue. The populations of many species have fallen to critically low levels. Their survival is threatened unless national and county governments take urgent action to protect wildlife.
- The high increase of livestock in certain areas can lead to competition between livestock and wildlife. By managing livestock numbers in key wildlife areas, Kenya Wildlife Services, county governments and local pastoral communities can maximise the co-existence of both livestock and wildlife in rangeland areas.
- Kenya Wildlife Services, county governments and local pastoral communities can support higher sustainable productivity and ecosystem conservation by increasing space for wildlife species through the development of conservancies. Conservancies can also be used as refuges for livestock during the dry season.

## Impact

One of our lead PRISE researchers is providing expertise as part of a technical team responsible for coordinating the development of a Ministry of Environment and Natural Resources strategy on national wildlife, conservation and management, which is due to be completed by November 2017.

The strategy will set national targets and indicators for viable and sustainable wildlife and habitat conservation over the next five years. The aim is to secure wildlife habitats, dispersal areas and corridors, promote evidence-based integrated planning for wildlife conservation, and stop poaching and the illegal wildlife trade. It also plans to establish and implement national long-term wildlife conservation and management funding, monitor and report the success of the strategy, and strengthen the way national and county governments, communities, individual landowners and other stakeholders work together to manage wildlife resources.

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Collaborative Adaptation Research  
Initiative in Africa and Asia



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