MOST PROTECTED AREAS OF THE SOUTHERN KENYA-NORTHERN TANZANIA (SOKNOT) LANDSCAPE ARE HIGHLY VULNERABLE TO CLIMATE CHANGE

BACKGROUND

The Southern Kenya-Northern Tanzania (SOKNOT) landscape is a transboundary conservation programme with the aim of restoring the wildlife migratory corridors and dispersal areas in the two countries (Kenya and Tanzania). Known for its variety of internationally renowned and unique conservation areas, SOKNOT covers some 134,000km² across three ecosystems: Mara-Serengeti; Amboseli-West Kilimanjaro and Tsavo-Mkomazi. SOKNOT transboundary area amounts to some 9 million on the Tanzanian side, and 5 million on the Kenyan side of the border, with annual growth rates of 2.75 % and 1.69 % respectively.

SOKNOT is one of WWF’s priority conservation areas in Africa, yet vulnerable to climate change. By 2050 total annual rainfall is projected to increase by over 8%, and temperature to increase by 11% (2°C). For these reasons, WWF’s Africa Climate Change Adaptation Initiative (AAI) in partnership with Anchor Environmental consultants, have conducted a vulnerability assessment (VA) study to estimate the potential climate impacts and assess the future vulnerability of thirteen (13) selected protected areas within the SOKNOT landscape to climate change.
EXPECTED CHANGES IN CLIMATE

Future climate conditions were estimated for the period 2040-2060 using the IPCC’s representative concentration pathway (RCP) 8.5 scenario, which is considered to be the most realistic global emissions scenario. Assuming no further change in forest cover Across SOKNOT:

Wet seasons are expected to get wetter by 2050, and dry seasons drier, with total annual rainfall expected to increase by just over 8%.

Temperatures are expected to increase by 11% (2.3°C) on average, with warming predicted to be greatest in the western regions of the landscape.

For the 13 protected areas assessed:

Expected increase in mean annual temperature from present to 2050 ranges from 8.8% for Tsavo East National Park to 20.5% for Kilimanjaro National Park (largely the result of a lower base).

Change in total annual precipitation ranges from an increase of 3.7% for Mkomazi National Park to an increase of 13.6% for South Kitui National Reserve.

POTENTIAL CLIMATE IMPACTS

Impacts were assessed in terms of habitat change (how different is the future biome representation of each protected area compared to current), species loss (what proportion of species will no longer find the protected area suitable in the future) and resource pressure (in which direction is resource pressure by local communities likely to move given community vulnerability to extreme climate events).

The overall impact score was computed by allocating equal weight to each of these components. Potential impact scores range from 24.7% for Ngorongoro Conservation Area to 55.5% for Ngai Ndethya National Reserve.

Habitat change: Three protected areas were predicted to have no habitat change (Amboseli National Park, South Kitui, Enduimet). Four were predicted to undergo substantial changes (>40%) in habitat (Tsavo west, Ngai Ndethya, Chuyulu Hills, Mkomazi)

Species loss: Species impact scores ranged from 1.1% for Kilimanjaro National Park to 46.5% for Ngai Ndethya National Reserve. The percentage of species predicted to no longer find the protected areas climatically suitable by 2050 are 11 (0.9%) of the current species and 57 (4.5%) additional species

Resource pressure: Current resource pressure scores ranged from 50.2% for South Kitui National Reserve to 79.4% for Kilimanjaro National Park; and is expected to increase for 11 protected areas (risk of flood and drought events)

ADAPTIVE CAPACITY

The adaptive capacity of parks is strongly affected by their level of financing in relation to management requirements. The potential change in protected area finances was coupled with the ability of protected areas to expand (in order to accommodate species range shifts) to yield each protected area’s adaptive capacity score.

The resulting adaptive capacity is fairly high, with only two protected areas scoring below 50% (Ngai Ndethya and South Kitui national reserves)
Tourism demand: The tourism demand scores ranged from 0% for Ngai Ndethya and South Kitui national reserves (these protected areas are expected to see severe impacts on future finances) to 100% for Kilimanjaro National Park (expected to see no impact on future finances).

Infrastructure at risk of flooding: Four protected areas had no buildings at risk while two had all their buildings at risk (Ngai Ndethya and South Kitui national reserves).

Potential expansion: Maasai Mara National Reserve has the least opportunity for expanding (close to 50%); while Amboseli National Park and South Kitui National Reserve have close to 90% of their surrounding land still in an untransformed state.

PROTECTED AREAS ASSESSED AND VULNERABILITY ASSESSMENT RANKING

The climate change vulnerability assessment was done for thirteen (13) protected areas, each of which were attributed vulnerability scores.

The vulnerability score indicates SOKNOT’s potential overall loss of biodiversity, taking both the potential impacts and the capacity to adapt into account. It was used for both ranking the conservation areas in terms of vulnerability and to classify each conservation area in terms of severity of vulnerability.

Thus, vulnerability scores ranging from 20-100% were considered “highly vulnerable”, those ranging from 10-20% were considered as “vulnerable”, and those ranging from 0-10” were considered to be “resilient”.

Of the thirteen (13) protected areas assessed,

- Seven protected areas were considered to be ‘highly vulnerable’, with the remaining six considered to be ‘vulnerable’. None of the protected areas assessed were considered ‘resilient’.

- The protected areas of the Tsavo-Mkomazi Ecosystem are all considered to be “highly vulnerable”.

- The other protected areas of the SOKNOT landscape, apart from Maasai Mara National Reserve, are considered “vulnerable”.

(Source: WWF, Coldrey et al)
RECOMMENDED ADAPTATION MEASURES

IMPROVED COMMUNITY PARTICIPATION IN AND BENEFITS FROM NATURAL RESOURCE MANAGEMENT

- Assessing climate impacts on community livelihoods and impacts on biodiversity
- Involving private sectors in supporting adaptation activities linked to tourism issues

REDUCED HUMAN WILDLIFE CONFLICTS

- Assessing climate impacts on community livelihoods and impacts on biodiversity

OPERATIONAL TRANSBOUNDARY MANAGEMENT

- Transboundary management of dispersal areas and migration corridors (climatically suitable areas)

CONSERVATION AND RESTORATION OF WILDLIFE HABITATS

- Building the resilience of highly and vulnerable conservation areas
- Assessing the climate impacts on wildlife protected areas and wildlife management areas
- Restoring/Creating the wildlife dispersal areas and migration corridors

PROTECTION AND RECOVERY OF WILDLIFE POPULATIONS

- Facilitating species movement and migration based on suitable migration corridors

© WWF Madagascar 2021
All rights reserved.
Any reproduction of this publication in full or in part must mention the title and credit WWF.
Africa Climate Change Adaptation coordinator
Hassina Hasina Rakotondrazafy
hrakotondrazafy@wwf.mg
WWF Madagascar Country Office
BP 738 Lot près III M 85 Ter Antsakaviro
Antananarivo 101, Madagascar
+261 20 22 348 85 / +261 34 49 888 05
wwfmadagascar@wwf.mg
www.wwf.mg