

**IRG/WP10-10738**

**Termite taxonomy and distribution  
with particular reference to climate  
change in Africa**

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**House heavily infested by *Odontotermes badius* termites**

# INTRODUCTION

Africa is well-known for its diversity of termite fauna > 664 known species.

Less than 5% cause serious damage to crops, trees, wood products and timber in service.

# Objectives

- \*Discuss African termite taxonomy and distribution and link this to climate change.
- \*Explore opportunities for sustainable termite management.

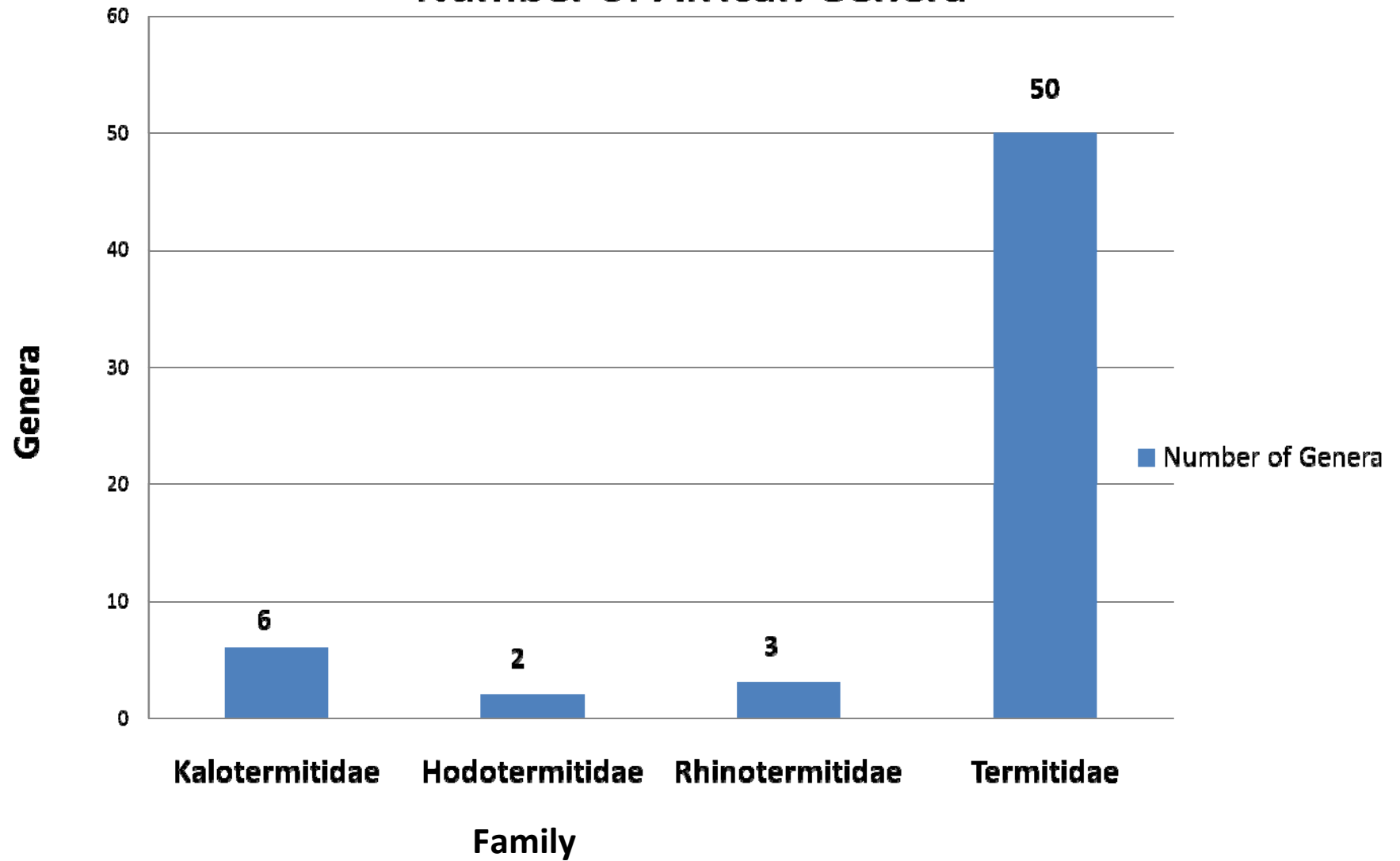
# Approach

- Literature review: Internet search, personal communications, and published information on African termite species and their distribution.
- Emphasis was placed on Eastern and Southern Africa.

# Termite taxonomy

- The taxonomy of African termites is difficult, and many new species are yet to be described.
- Traditional methods have short comings.
- Molecular technique-solution.

## Number of African Genera



# Distribution

- Northern Africa: species diversity is low (<15 spp.) probably due to extremely dry conditions.
- East Africa: >143 termite species. Their distribution extends to Djibouti, Eritrea, Ethiopia, Somalia and



## Distribution continued...

- Sudan to the North, and Malawi, Mozambique, Zambia and Zimbabwe to the south.
- Southern Africa: >165 species.
- Distribution include South Africa, Mozambique, Botswana, Swaziland, Lesotho and Namibia.

## Distribution continued ...

- *Macrotermes* species dominate the termite fauna in arid environments.
- *Macrotermes bellicosus*, *M. falciger*, *M. michaeisen* and *M. subhyalinus* occur throughout most of the arid areas of Africa.
- Macrotermes build massive termite mounds which are a prominent feature of the African savanna woodland.

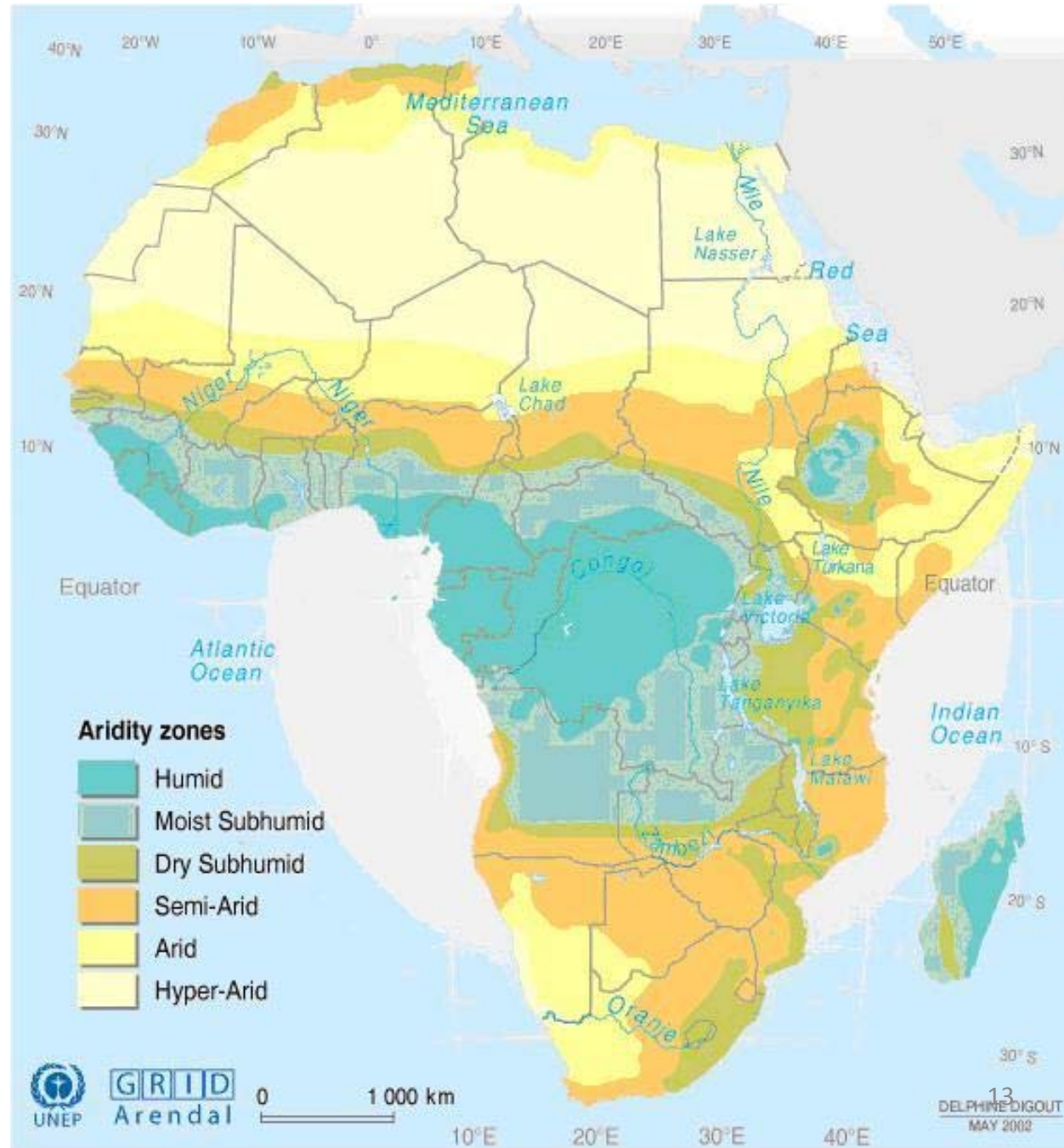


**Mound *Macrotermes falciger* in African savanna woodland**

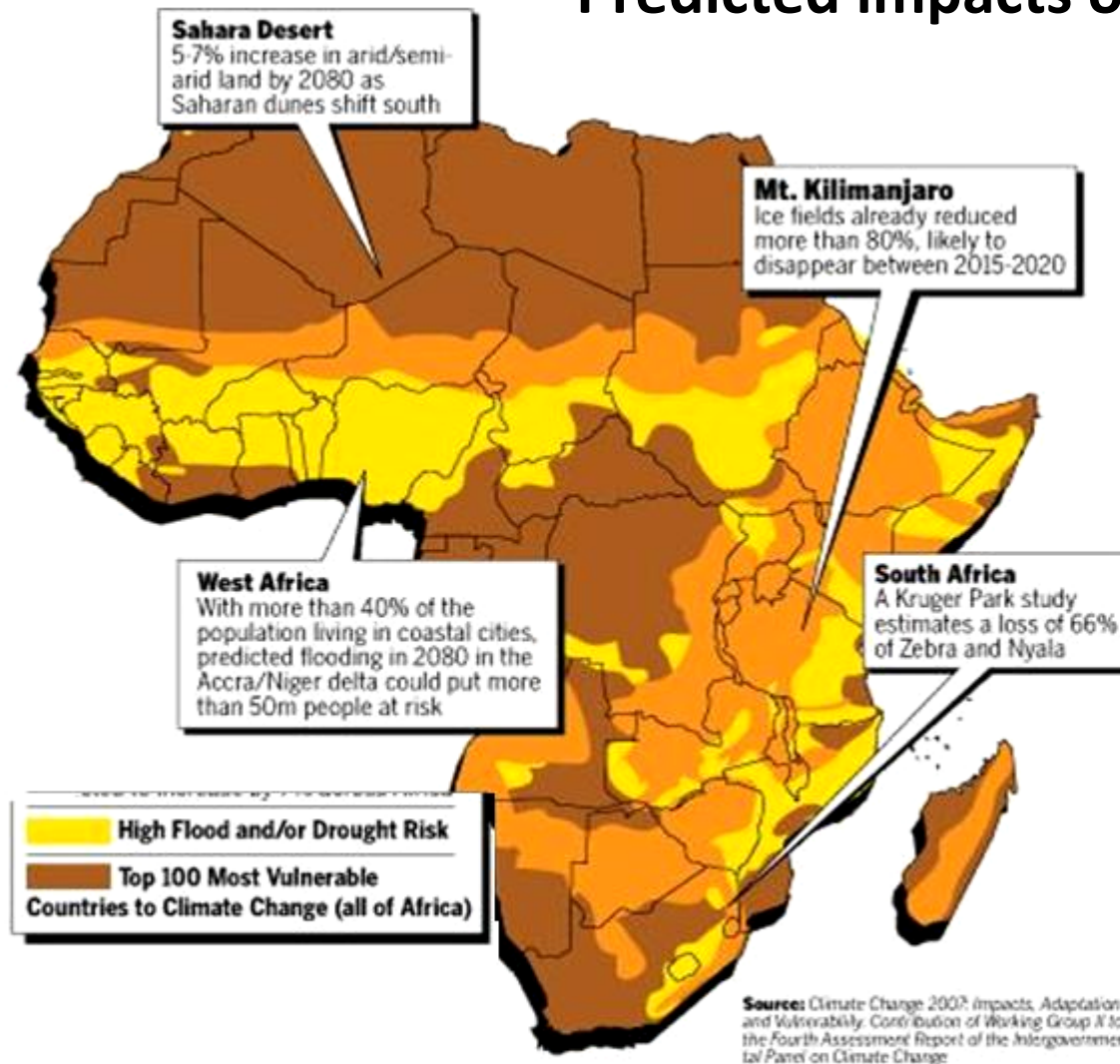
# Termites and climate change in Africa

- Climate change has emerged as a major environmental challenge.
- This will positively or negatively affect termite distribution.
- The impact of climate change on termite distribution and damage in Africa is not known with any great confidence.

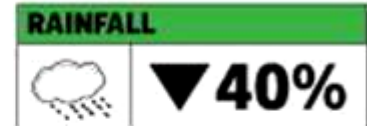
Currently much of Africa is arid



# Predicted impacts of climate change



## The next century



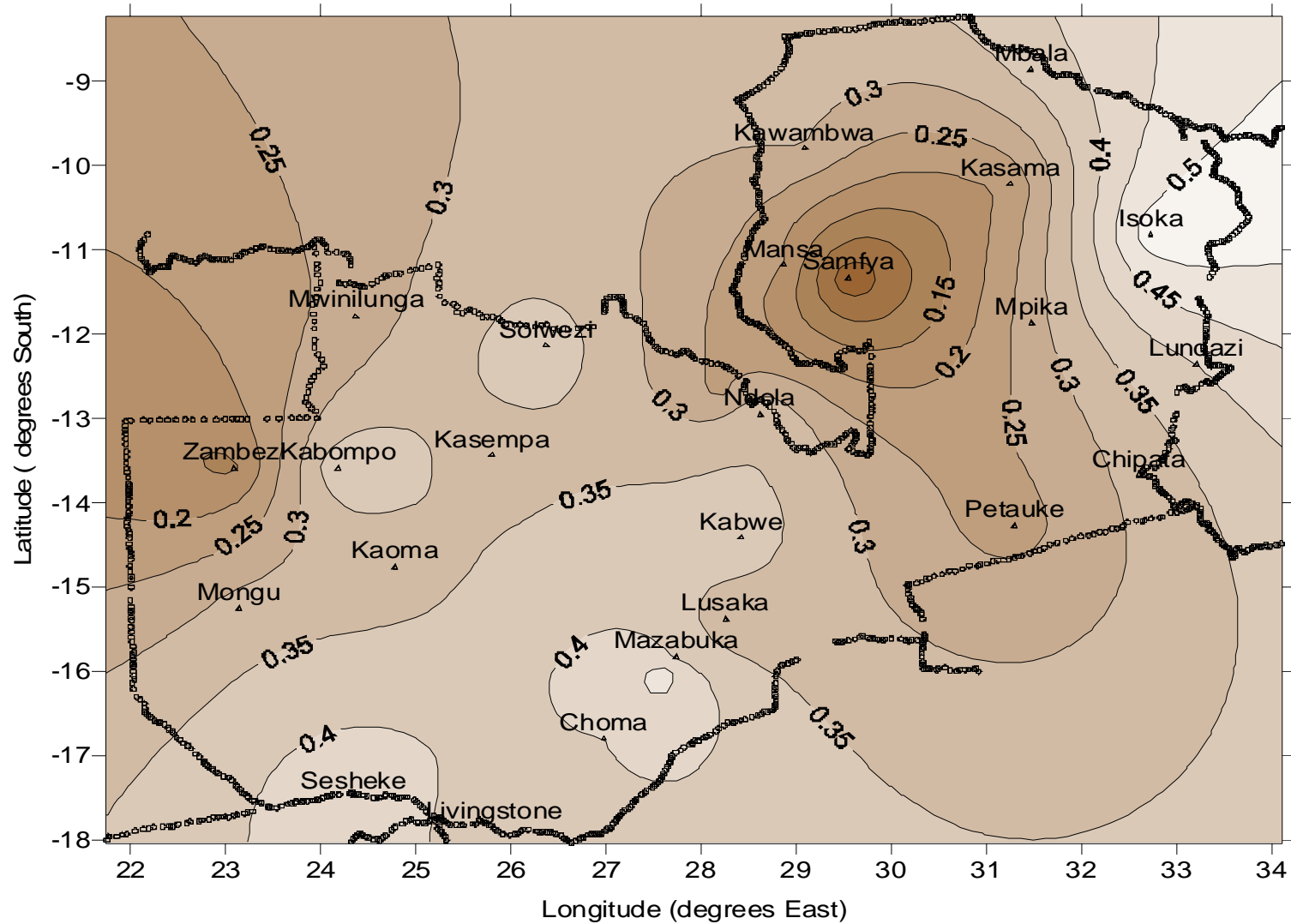
A decrease of up to 40% in West Africa; up to 20% in North Africa



Conservative estimates put temperature increase at a minimum of 3-4 degree celcius across Africa

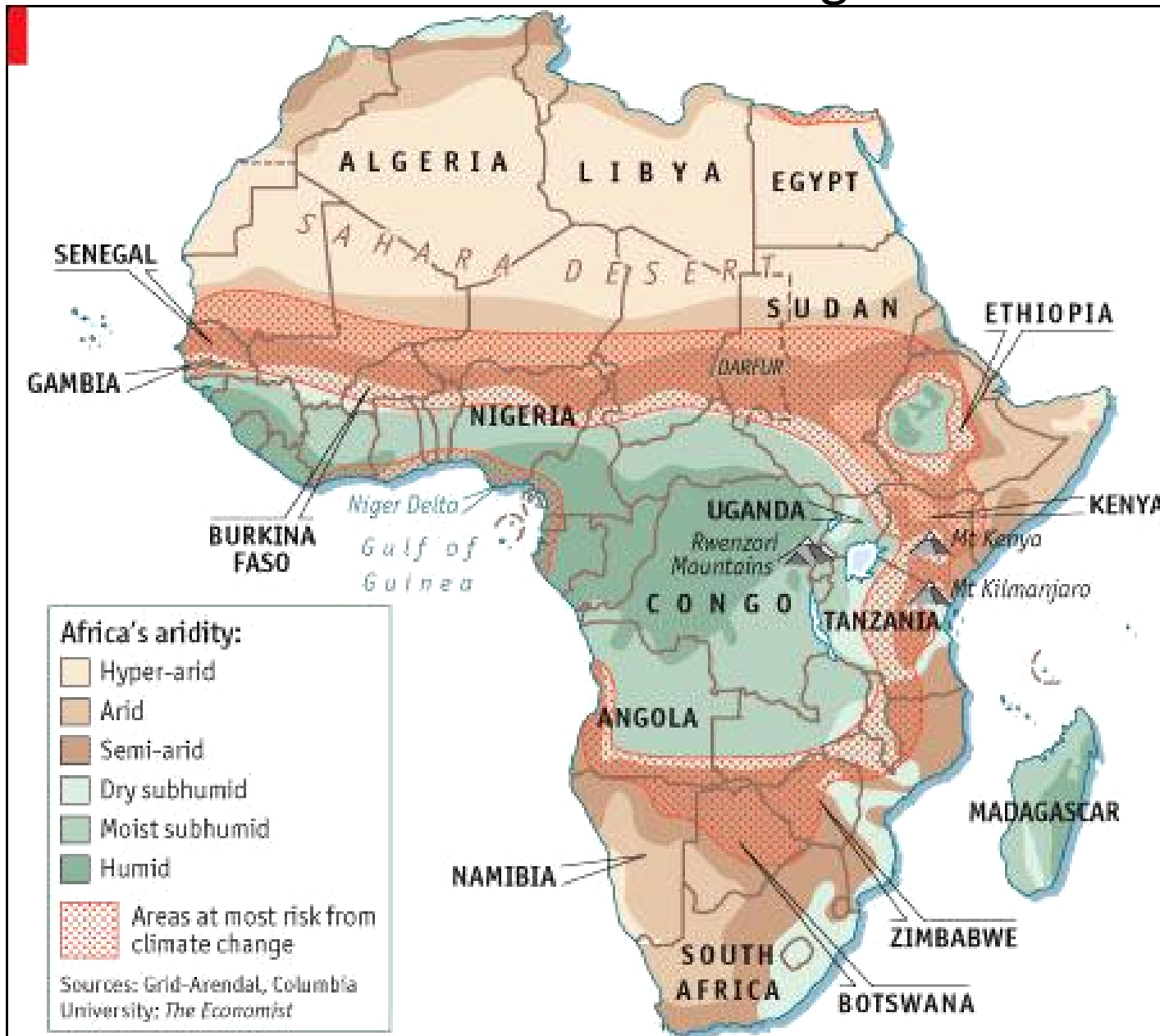


Climate models predict up to a 20% increase in cyclone intensity



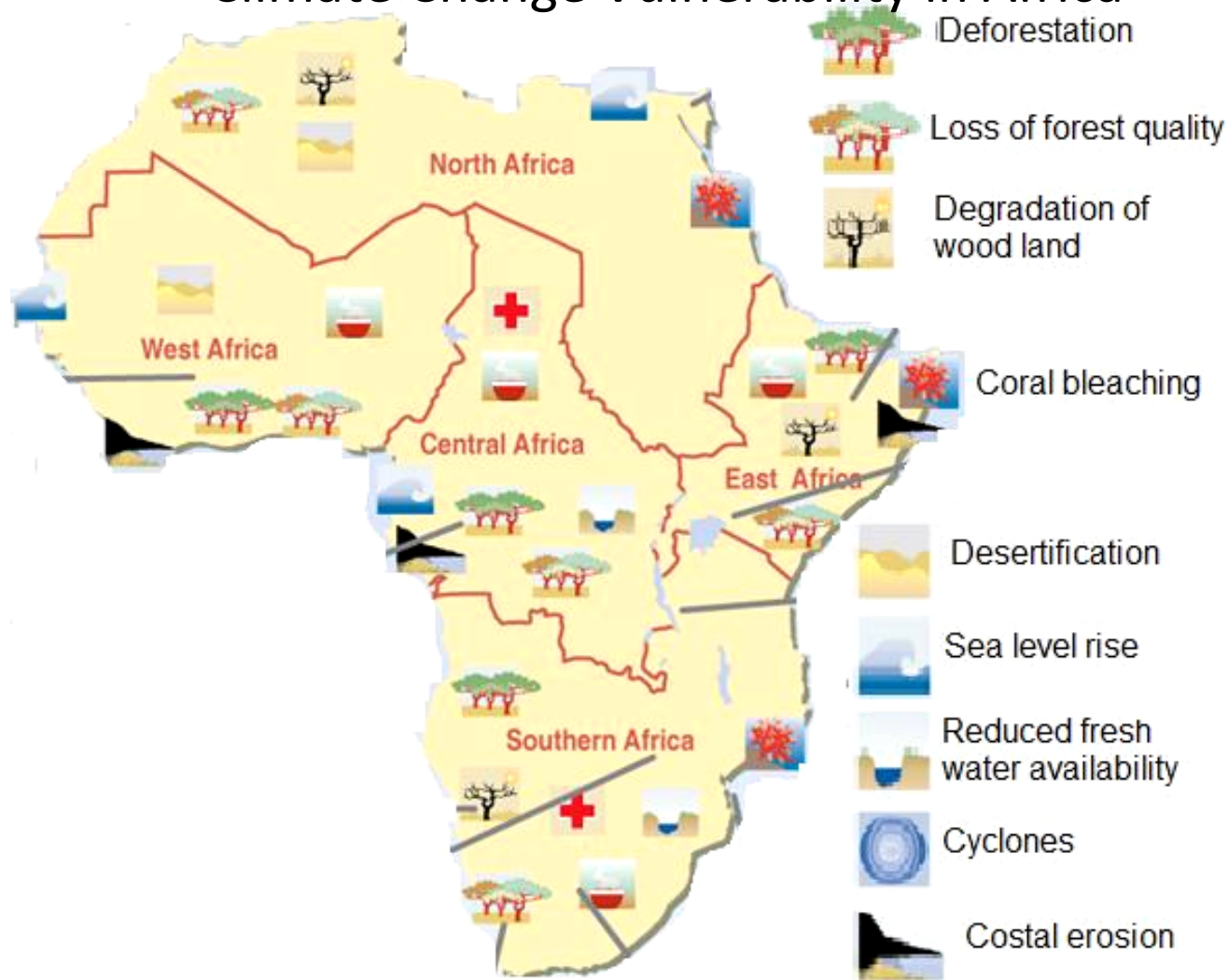
Contour map of the rate of increase in mean temperature ( $^{\circ}\text{C}$ ) per decade for Zambia.

# Areas at risk from climate change in Africa





# Climate Change Vulnerability in Africa



Increase in aridity (desertification), deforestation, degradation of woodland and the consequent loss of food and habitat for termites are likely to affect termite distribution and damage. The map above was adapted from [http://maps.grida.no/go/graphic/climate\\_change\\_vulnerability\\_in\\_africa](http://maps.grida.no/go/graphic/climate_change_vulnerability_in_africa)

# Economic importance

- Timber in service (annual losses US \$ 8-20 million)
- Agricultural crops (20-60%) losses
- Forestry plantations (30-100%)



***Eucalyptus grandis* sapling felled by *Macrotermes bellicosus*  
In Uganda (Photo by Philip Nyeko)**

## **Possible implications**

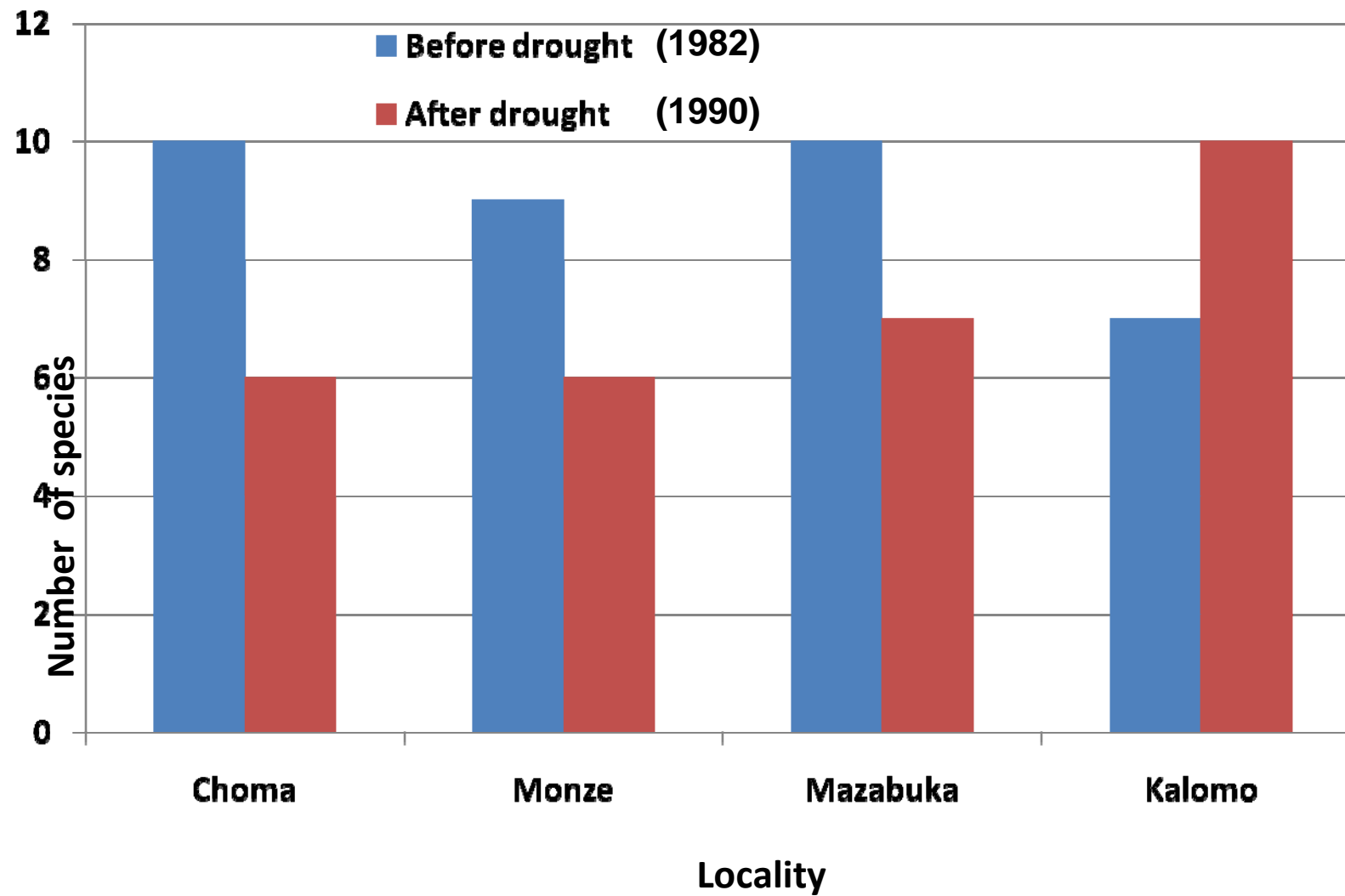
- 1. Termites adapted to moist humid areas may go extinct.**
- 2. Termite species adapted to hot and arid environments may expand their distribution with increase in aridity of humid areas.**
- 3. Termite pest damage may increase.**

## **Implications continued....**

- **Damage by termites is greater during droughts than periods of regular rainfall.**
- **Ugandan and Kenyan farmers considered termite damage to be more severe in the dry months compared to the wet months.**
- **Farmers in Uganda and Zambia mentioned that termite problems are more serious now than in the past.**

## **Implications continued....**

- **According to farmers in eastern Zambia, termite damage to crops and trees is more severe during drought periods.**
- **Increase in termite damage could also be associated with climate change-induced drought.**



**Drought effect on termite species (Nkunika, 1994).**

# Conclusions and the way Forward

- **Termite identifications are crucial to understanding their distribution and management.**
- **There is an urgent need to build Human and institutional capacity in termite taxonomy in Africa using modern techniques.**
- **There is need to adopt Integrated Pest management (IPM) as a policy on termite control in the current climate change in Africa.**



***THANK YOU  
FOR YOUR  
ATTENTION***