Climate Change Impacts and Vulnerability in Africa

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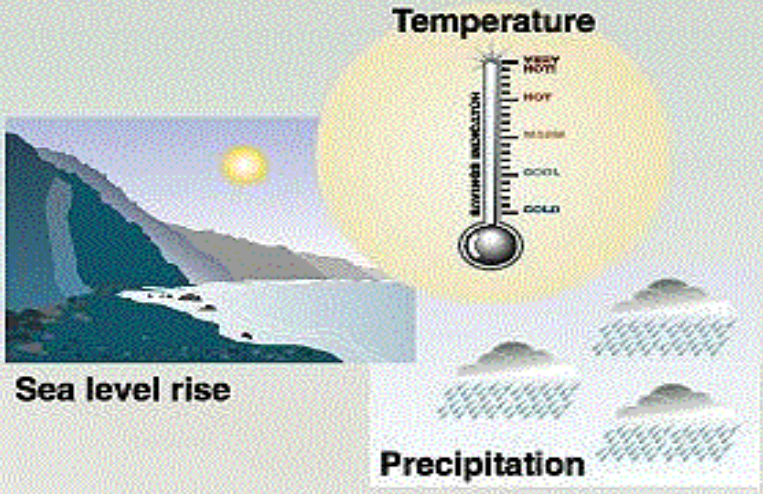
Introduction

- **Climate change is real and is happening now. The average global surface temperature has warmed by 0.8°C in the past century and 0.6°C in the past three decades and largely as a result of human activities.**
- **Africa is already a continent under pressure from climate stresses and is highly vulnerable to the impacts of climate change. Many areas in Africa are recognized as having climates that are among the most variable in the world on seasonal and decadal time scales. Floods and droughts can occur in the same area within months of each other. These events can lead to famine and widespread disruption of socio-economic well-being.**

Vulnerability of the African Continent

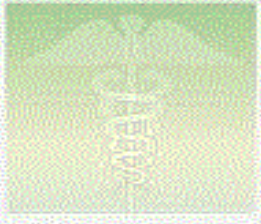
- **The African continent is particularly vulnerable to the impacts of climate change due to factors such as widespread poverty, weak institutions, limited infrastructure, lack of technology and information, poor access to resources, recurrent droughts, inequitable land distribution, armed conflicts and overdependence on rain-fed agriculture among others.**

Potential climate changes impact



Impacts on...

Health



Weather-related mortality
Infectious diseases
Air-quality respiratory illnesses

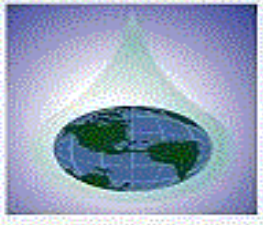
Agriculture

Crop yields
Irrigation demands

Forest

Forest composition
Geographic range of forest
Forest health and productivity

Water resources



Water supply
Water quality
Competition for water

coastal areas

Erosion of beaches
Inundation of coastal lands
additional costs to protect coastal communities

Species and natural areas

Loss of habitat and species
Cryosphere: diminishing glaciers

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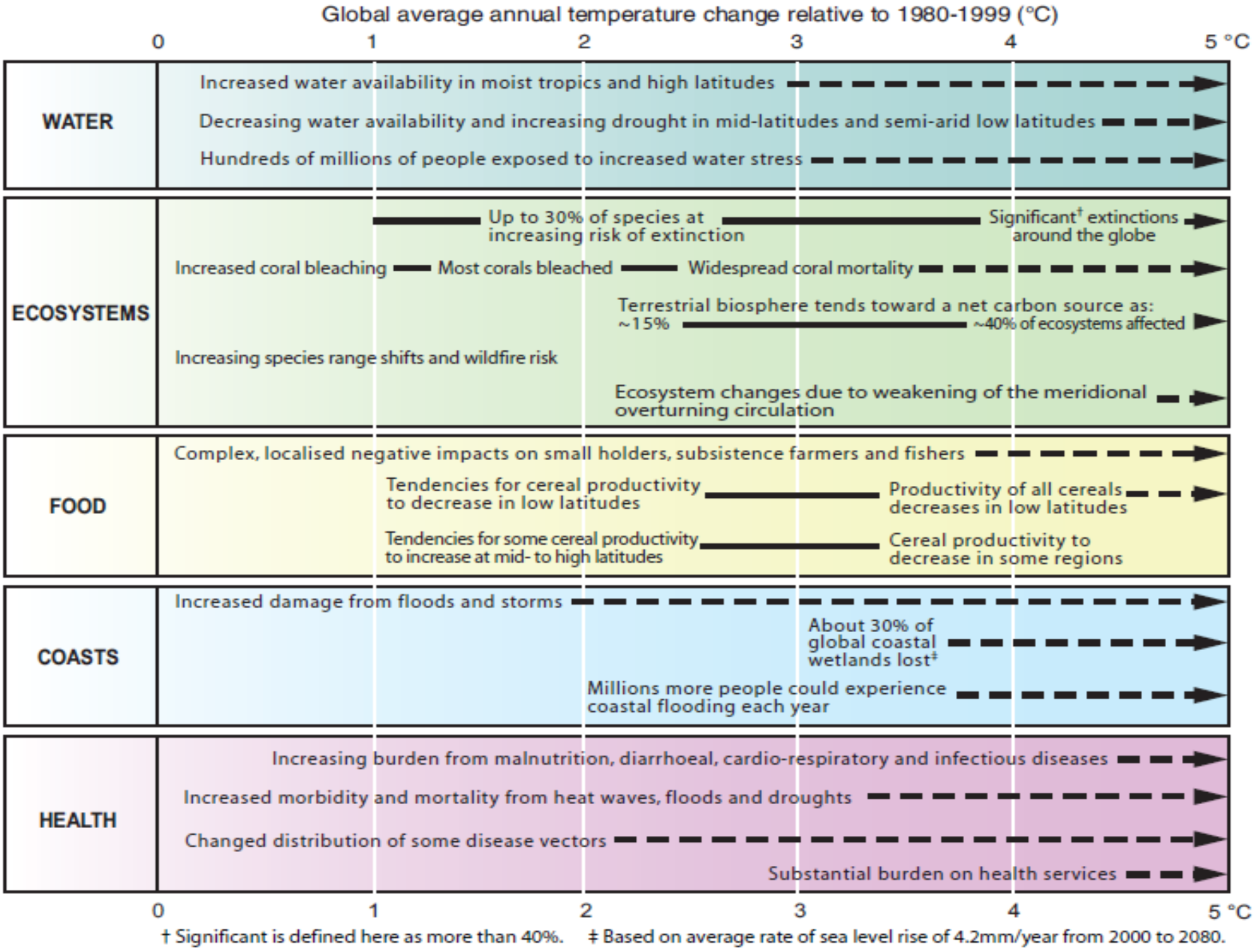
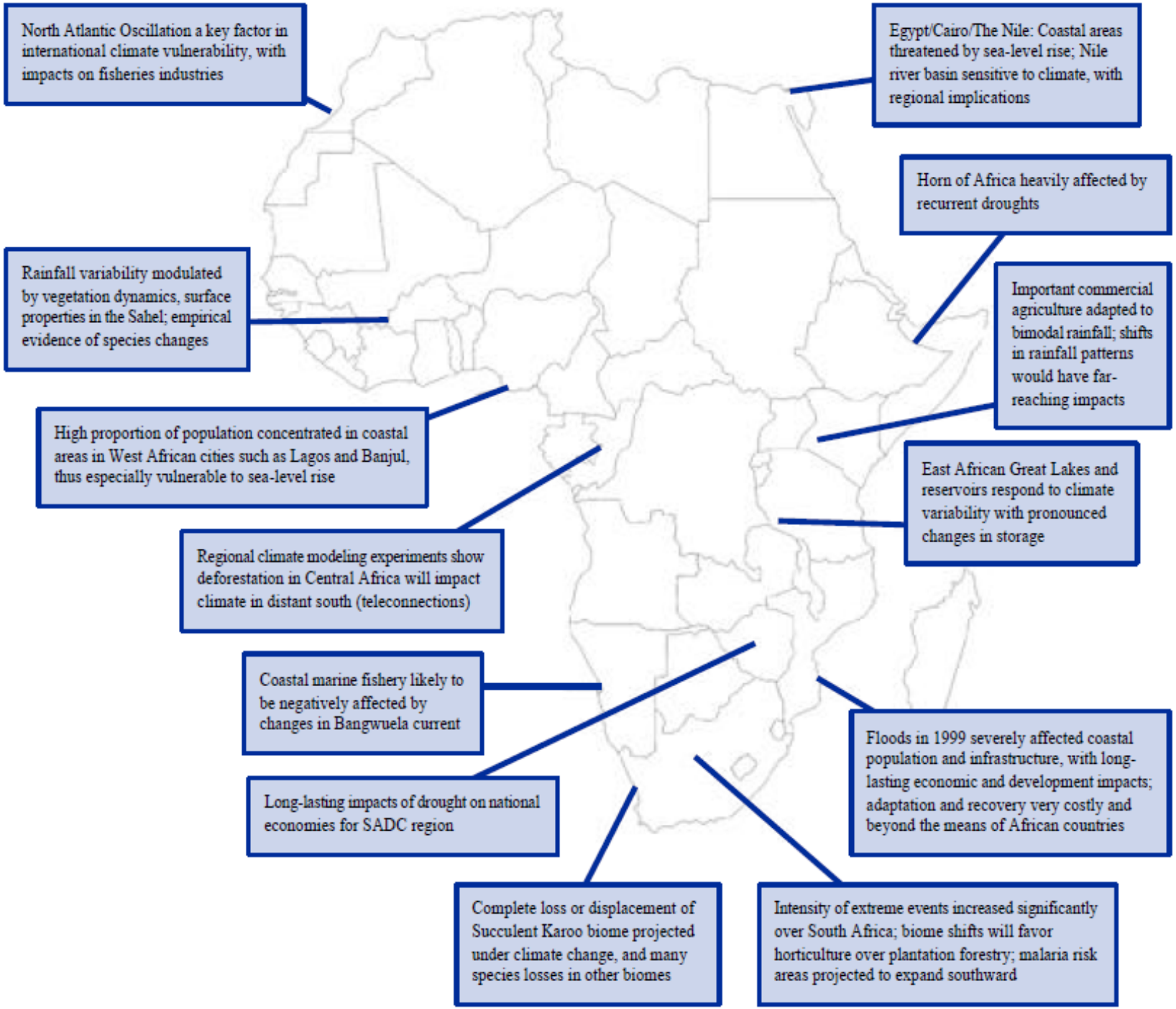
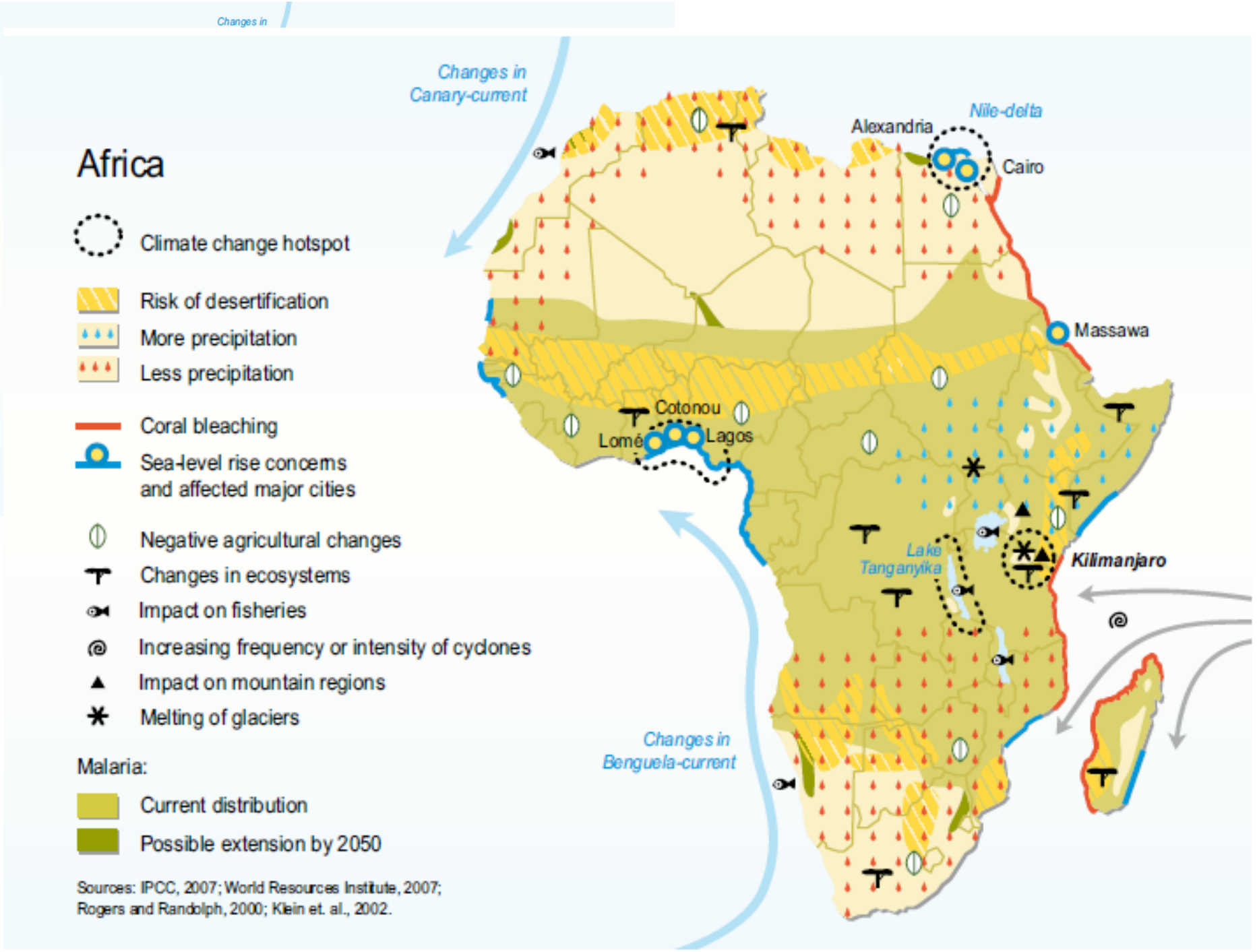
GRAPHIC DESIGN : PHILIPPE REKACEWICZ

Source: United States environmental protection agency (EPA).



† Significant is defined here as more than 40%. ‡ Based on average rate of sea level rise of 4.2mm/year from 2000 to 2080.


North Atlantic Oscillation a key factor in international climate vulnerability, with impacts on fisheries industries
Egypt/Cairo/The Nile: Coastal areas threatened by sea-level rise; Nile river basin sensitive to climate, with regional implications
Horn of Africa heavily affected by recurrent droughts
Rainfall variability modulated by vegetation dynamics, surface properties in the Sahel; empirical evidence of species changes
Important commercial agriculture adapted to bimodal rainfall; shifts in rainfall patterns would have far-reaching impacts
High proportion of population concentrated in coastal areas in West African cities such as Lagos and Banjul, thus especially vulnerable to sea-level rise
East African Great Lakes and reservoirs respond to climate variability with pronounced changes in storage
Regional climate modeling experiments show deforestation in Central Africa will impact climate in distant south (teleconnections)
Coastal marine fishery likely to be negatively affected by changes in Bangwuela current
Floods in 1999 severely affected coastal population and infrastructure, with long-lasting economic and development impacts; adaptation and recovery very costly and beyond the means of African countries
Long-lasting impacts of drought on national economies for SADC region
Complete loss or displacement of Succulent Karoo biome projected under climate change, and many species losses in other biomes
Intensity of extreme events increased significantly over South Africa; biome shifts will favor horticulture over plantation forestry; malaria risk areas projected to expand southward


Changes in
Changes in
Canary-current
Africa
Climate change hotspot
Risk of desertification
More precipitation
Less precipitation
Coral bleaching
Sea-level rise concerns
and affected major cities
Negative agricultural changes
Changes in ecosystems
Impact on fisheries
Increasing frequency or intensity of cyclones
Impact on mountain regions
Melting of glaciers
Malaria:
Current distribution
Possible extension by 2050
Sources: IPCC, 2007; World Resources Institute, 2007;
Rogers and Randolph, 2000; Klein et. al., 2002.
Nile-delta
Alexandria
Cairo
Massawa
Cotonou
Lomé
Lagos
Lake
Tanganyika
Kilimanjaro
Changes in
Benguela-current

Threatened deltas

Relative vulnerability of coastal deltas as indicated by the indicative population potentially displaced by current sea-level trends to 2050 (Extreme ≥ 1 million; high 1 million to 50,000; medium 50,000 to 5,000)

WMO

UNEP

Conclusions

Climate change impacts have the potential to undermine and even, undo progress made in improving the socio-economic well-being of many countries in Africa.