

KENYA: CLIMATE CHANGE IMPACTS, VULNERABILITY, MITIGATION AND ADAPTATION STRATEGIES

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Outline of Presentation

- ◆ Climate change evidence and impacts
- ◆ Climate change risks and vulnerability
- ◆ Climate change mitigation
- ◆ Climate Change adaptation strategies
- ◆ Conclusion

Evidence of Climate Change in Kenya

- Rising temperatures (max. 0.2-1.3°C, min. 0.7-2.0°C)
- Irregular and unpredictable rainfall
- Increased frequency of intense rainfall
- Melting and retreat of mountain glaciers;
- Increasing frequency of ENSO events (extreme climate events- Frequent occurrence of droughts and Floods)

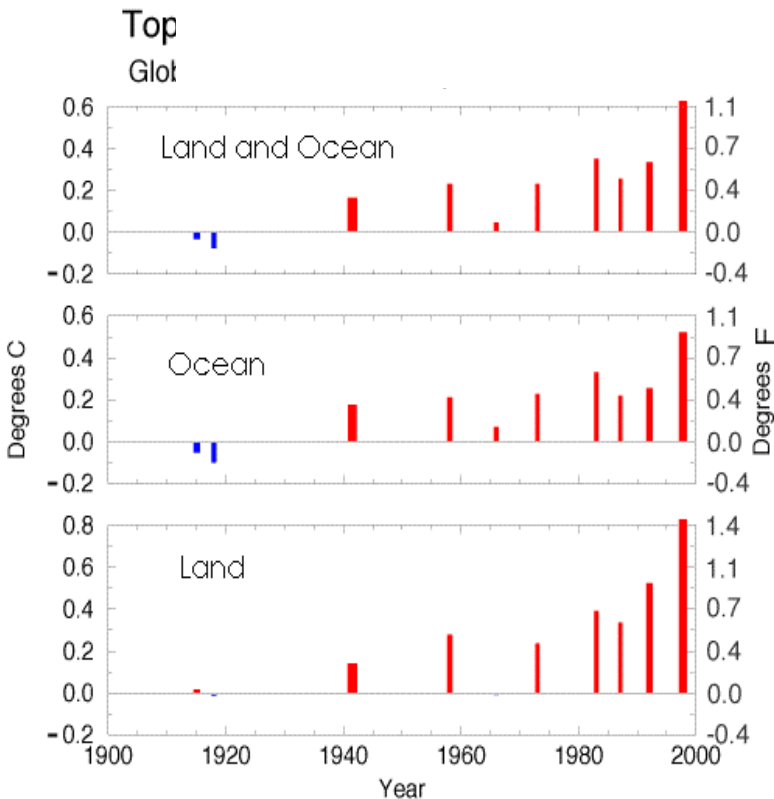
Impacts

- The climate change impacts are often compounded by anthropogenically driven local environmental degradation, and include:
- Increasing extent of arid and semi-arid land
- Loss of biodiversity
- Receding rangelands
- Loss of land, crops, coastal structures, ecosystems due to SLR
- Alteration, spatially and temporally, of water availability
- Droughts, reduced river flows and related crop failures, human-wildlife conflicts, and hydropower potential
- Spread of diseases such as malaria, cholera

Impacts – cont' d

- Population displacement and migration from climate related disaster prone areas
- Disruption/destruction of tourist attractions e.g. Snow capped mountains, wildbeast migration, coral bleaching
- Changes to or loss of fisheries
- Destruction of infrastructure by heavy rainfall

Flooding: ENSO and its Impact



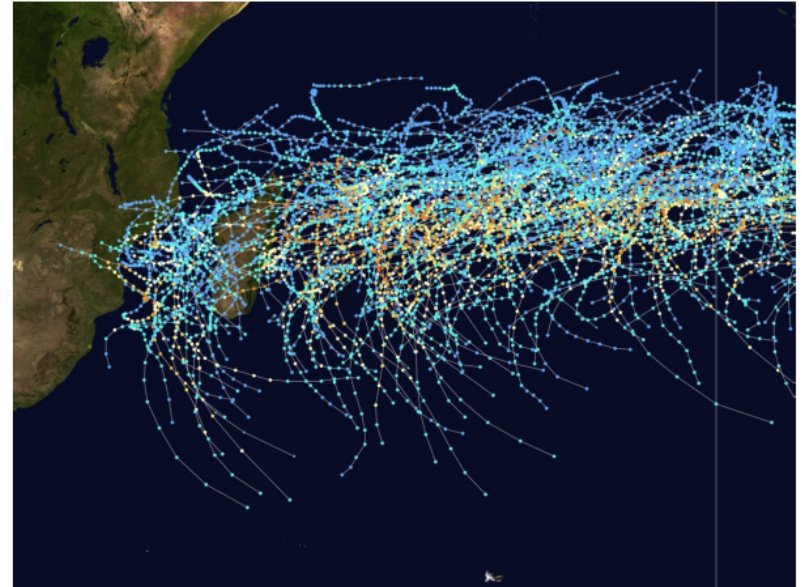
Top 10 El Niño Events in 20th Century. Note the increase in the frequency and intensity of ENSO particularly from 1980.

- In eastern Africa, the last strong ENSO in 1997/98 caused:
- widespread destruction and losses in the agricultural sector,
- destroyed critical infrastructure such as roads, railways and power supply systems by extensive flooding and localised landslides
- outbreak of climate and water related diseases,
- significant loss of human and other life,
- Loss of corals through bleaching
- Damage to telecommunications and transport infrastructure alone was estimated to be US\$ 1 billion

Risks

- Tropical cyclones

- ⇒ Power outages during storms disrupt transportation, economic activity and supply of potable water.
- ⇒ Physical destruction caused by storms is often extremely expensive to repair and results in fatalities and injuries to humans and wildlife.
- ⇒ Inundation of water during storms can contaminate water supplies with saltwater, chemicals and waterborne diseases.



Tracks of all tropical cyclones in the Southwest Indian Ocean from 1980 to 2005. 90° E longitude is marked (vertical blue line) as this is the eastern boundary of the basin. The points show the locations of the storms at six-hourly intervals (Source: Wikimedia Commons)

Heavy Precipitation Events



Nzoia river basin - Lower catchments
Main floods on the right side of the river
Source: UNEP & Government of Kenya, 2003

- ⇒ More frequent heavy precipitation events will have far-reaching economic and social implications throughout the urban environment, especially through **flooding** and **landslides**.
- ⇒ The frequency and severity of flooding has generally increased.
- ⇒ The risk from landslides is also likely to increase
- ⇒ Water supply as well as Sanitation systems are susceptible to damage by flooding/ landslides

Extreme Heat Events Particularly in Cities

- ⇒ Nairobi City is 2°C warmer than surrounding areas.
- ⇒ Increased incidents of heat stroke
- ⇒ The combination of urban population growth, changing local weather conditions, urban heat-island impacts and economic growth has the potential to substantially increase demand for energy

Vulnerability

- Poverty and natural resource dependent livelihoods underpin the vulnerability to climate change
- The increasing frequency and intensity of extreme climatic events and slow-onset changes will increase the vulnerability of urban and rural economic assets and, subsequently, the costs of doing business
- retail and commercial services, industry, tourism and insurance can all be affected
- Changes in the regulatory environment, including climate change mitigation policies (e.g. carbon tax and emissions targets) could potentially raise the costs of business for industries, especially if they are energy intensive.

Socio-Economic Vulnerability – cont' d

- Industries dependent upon climate-sensitive inputs are also likely to experience changes in the reliability, availability and cost of major inputs (e.g. timber) as a result of changes in climate and climate mitigation policies.
- The tourism industry is highly dependent upon reliable transportation infrastructure in at risk areas such as coastal zones
- The insurance industry is vulnerable to climate change, particularly extreme climate events that can affect a large area; the uncertainty surrounding the probability of high-loss events in the future is likely to place upward pressure on insurance premiums

Socio-Economic Vulnerability – cont' d

- Loss of ecosystem services, besides potentially affecting food provision and human health, can significantly reduce incomes/ revenue
- Extreme climate events can disrupt the ability of individuals and households to sustain livelihoods by destroying livelihood assets or the means of production available to individuals, households or groups
- Public health: destruction of e.g. water and sanitation systems, exposure to heat waves, etc.

Mitigation - CDM Activity in Kenya

- 7 CDM Projects Registered and Trading, 1,236,469 reductions traded as of March 2012.
 - ⇒ “35 MW Bagasse Based Cogeneration Project” by Mumias Sugar Company Limited (MSCL)
 - ⇒ Olkaria II Geothermal Expansion Project
 - ⇒ Olkaria III Phase 2 Geothermal Expansion Project in Kenya
 - ⇒ Aberdare Range / Mt. Kenya Small Scale Reforestation Initiative Kirimara-Kithithina Small Scale A/R Project
 - ⇒ Aberdare Range/ Mt. Kenya Small Scale Reforestation Initiative Kamae-Kipipiri Small Scale A/R Project
 - ⇒ Lake Turkana 310 MW Wind Power Project
 - ⇒ Redevelopment of Tana Hydro Power Station Project
- 17 CDM Projects were under Validation as of March 2012

What the Treasury is Doing

- Establishment of a Carbon Finance desk.
- Development of carbon finance and emissions trading national policy.
- Advocacy and awareness forums on carbon financing.
- Development of a climate change financing mechanism and a carbon trading platform.
- Increased communication campaigns on climate change and related risks and opportunities.
- Supporting climate investment policies i.e. guaranteed access to the grid for IPPs, creating financial incentives through Feed in Tariffs. (FiTs)
- Enforcing regulatory instruments, fiscal incentives for making climate related investment relatively more attractive.

Mainstreaming CCA - NCCRS

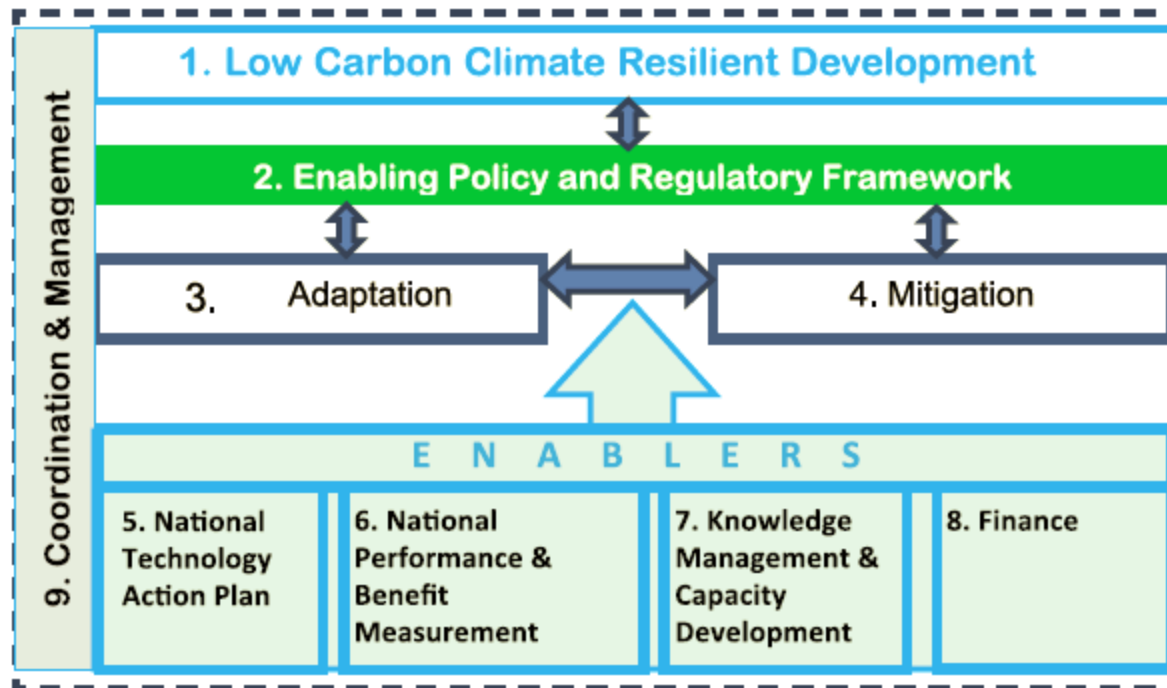
- National Climate Change Response Strategy (NCCRS) 2010 provides strategic direction for sector-oriented adaptation approaches, particularly: **health, agriculture, water, tourism and wildlife, fisheries, pastoralism/livestock, infrastructure sectors, and social amenities**
 - ⇒ Recognises key roles of Governance, Monitoring, Capacity Building and R&D within an adequately funded context

Adaptation Actions: Some Examples by Sector

- **Agriculture:** agroforestry, conservation tillage, drought-tolerant crops
- **Environment, Water & Sanitation:** increase tree cover to 10%, restore and protect water towers, improve waste management systems – gas capture
- **Infrastructure:** mainstream CC into development of facilities, develop renewable energy resources
- **Industry:** Enhance efficiencies
- **Health:** improved disease surveillance, improved access to water and sanitation

Mainstreaming CCA - NCCAP

- National Climate Adaptation Action Plan (NCCAP) 2013-17
 - ⇒ Operationalises the NCCRS 2010
 - ⇒ Multi-stakeholder and multi-sectoral consultations
 - ⇒ Wide ranging interventions to be implemented across public and private sectors



Mainstreaming CCA – cont' d

- Ministry of Planning
 - ⇒ County Integrated Development Plan (CIDP) –ministry of planning developed guidelines for mainstreaming CC. How different from the District Development Plans ?
 - ⇒ Threshold 21 (T21) Model – a tool to link costing to planning
 - ⇒ Kenya Human Development Report 2013 - Climate Change and Human development: harnessing emerging opportunities
- Climate Change Bill and Climate Change Policy

Conclusions

- Urgent action is required to be undertaken to mitigate the impacts of climate change
- To effectively address the threats and risks posed by climate change, there is need to:
 1. Provide an adequate knowledge base within which we can embed practical, low cost and sustainable solutions
 2. Harness coordinated funding to tackle the threats and risks
 3. Grow institutions that can manage multi-dimensional, multi-sectoral and multidisciplinary problems/issues that are associated with climate change
 4. Effectively pool together all stakeholders – policy and decision makers, practitioners, end-users and local communities to collectively address the imposed threats/risks
 5. Plan ahead, based on realistic scenarios, to mitigate and/or adapt to the impacts.

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