What does it mean for Uganda's development?

Session title: Key Economic Sectors and services

Presenter, Prof Joseph Hella – Sokoine University of Agriculture – Tanzania – **LA Chapter 10 AR5**

Date: 21st August 2014

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Economic Sectors & Services (ESS)

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In Chapter 10 of IPCC AR5 meant to assesses the implications of climate change on

- economic activity in key economic sectors and services,
- economic welfare, and
- economic development

What are these ESS

- Energy
- Water services
- Transport
- Other primary & Economic Activities
- Recreation & Tourism
- Insurance & Financial services
- Health services
- Market & Development
- Other related

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Key Drivers to Climate Change

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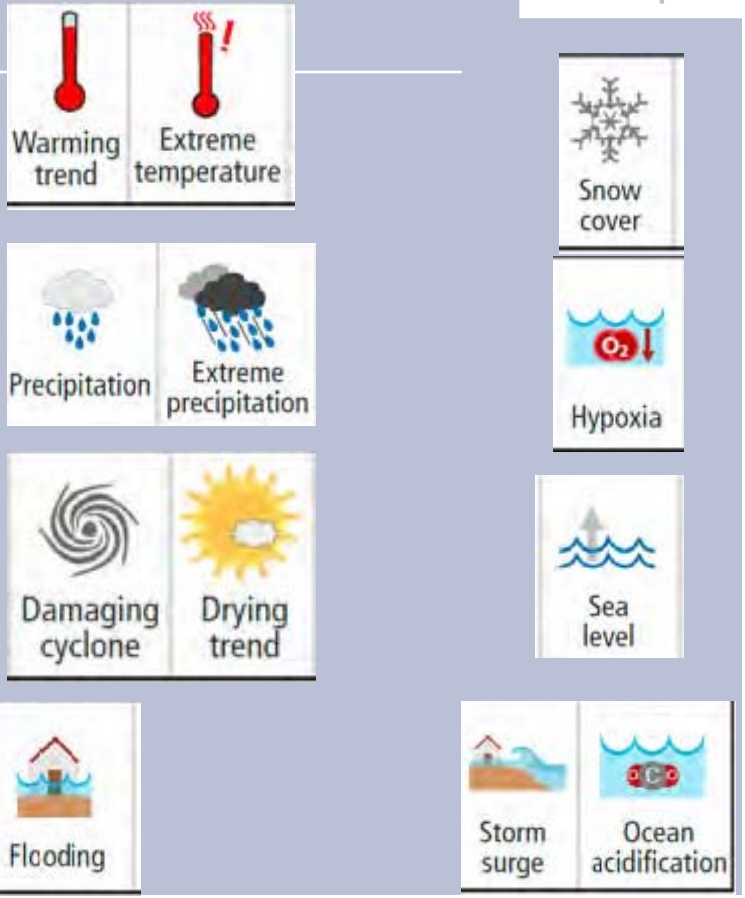
Gradual changes in various climate attributes (*temperature, precipitation, windiness, cloudiness, etc.*) and possible changes in the frequency and intensity of extreme weather events will progressively affect operation over time



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Climate Change ……

1) will reduce ENERGY demand for heating and increase energy demand for cooling in the residential and commercial sectors (*high agreement, robust evidence);*
2) will affect different ENERGY sources and technologies differently, depending on the resources (water flow, wind, insulation), the technological processes (cooling) or the locations (coastal regions, floodplains) involved (*high agreement, robust evidence).*
3) may influence the integrity and reliability of PIPELINES & ELECTRICITY grids (*medium agreement, medium evidence).*

Climate Change ……

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- will have impacts, positive and negative and varying in scale and intensity, on **WATER SUPPLY** infrastructure and water demand (*high agreement, robust evidence), but the economic implications are not* well understood.
- may negatively affect **TRANSPORT** infrastructure (*high agreement, limited evidence).*
- will affect **TOURISM RESORTS**, particularly ski resorts, beach resorts, and nature resorts (*high agreement, robust evidence) and tourists may spend their holidays at higher altitudes and latitudes (high agreement, medium evidence).*

Climate Change ……

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- will affect **INSURANCE SYSTEMS** (*high agreement, robust evidence).*
- will affect the **HEALTH SECTOR** (*high agreement, medium evidence).*
- may decrease **PRODUCTIVITY AND ECONOMIC GROWTH,** but the magnitude of this effect is not well understood (*high agreement, limited evidence).*
- Globally aggregated economic impacts of global warming are a small fraction of income up until 3°C [*medium evidence, high agreement]..*

Key Risk – reduction in crop yield

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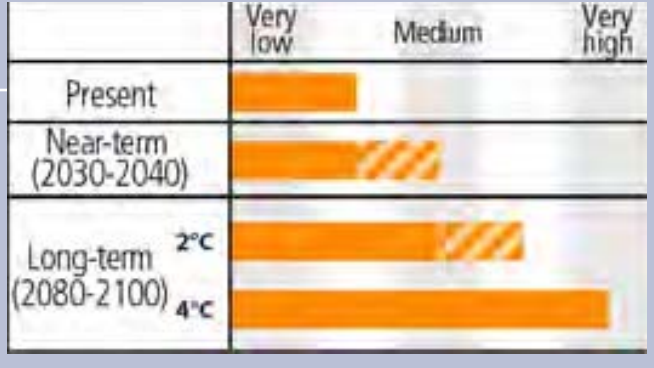

Reductions in mean crop yields because of climate change and increases in yield variability. (*high confidence*)

With or without adaptation, negative impacts on average yields become *likely* from the 2030s with median yield impacts of 0 to -2% per decade projected for the rest of the century, and after 2050 the risk of more severe impacts increases.

Key Risk – water supply

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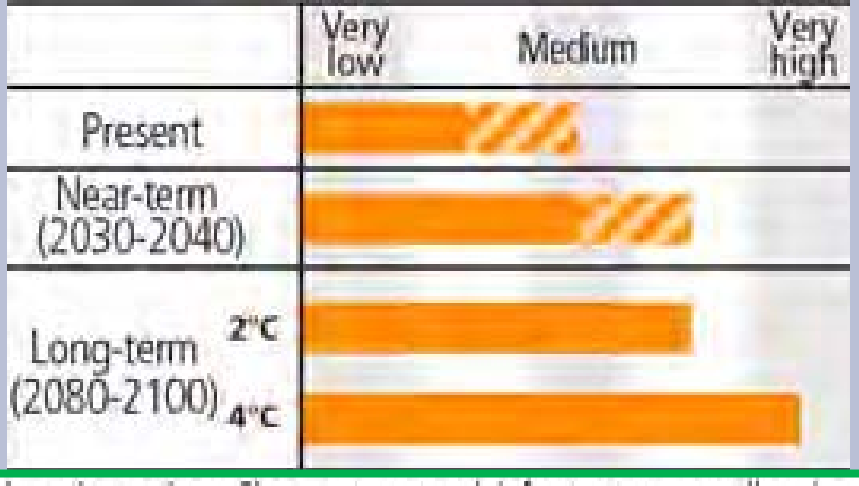
Urban risks associated with water supply systems (*high confidence*)



Adaptation options: Changes to network infrastructure as well as demand-side management to ensure sufficient water supplies and quality, increased capacities to manage reduced freshwater availability, and flood risk reduction.

Key Risk - housing

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Urban risks associated with housing *(high confidence)*

Poor quality, inappropriately located housing is often most vulnerable to extreme events. Adaptation options include enforcement of building regulations and upgrading. Some city studies show the potential to adapt housing and promote mitigation, adaptation, and development goals simultaneously. Rapidly growing cities, or those rebuilding after a disaster, especially have the opportunities to increase resilience, but this is rarely realized. Without adaptation, risks of economic losses from extreme events are substantial in cities with high-value infrastructure and housing assets, with broader economic effects possible.

Key Risk – human displacement

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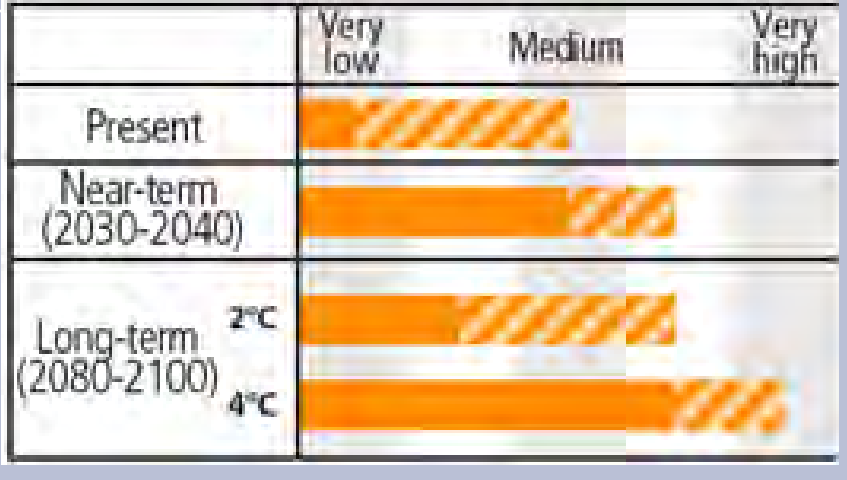
Displacement associated with extreme events (*high confidence*)



Adaptation to extreme events is well understood, but poorly implemented even under present climate conditions. Displacement and involuntary migration are often temporary. With increasing climate risks, displacement is more likely to involve permanent migration.

Key Risk - violent & conflicts

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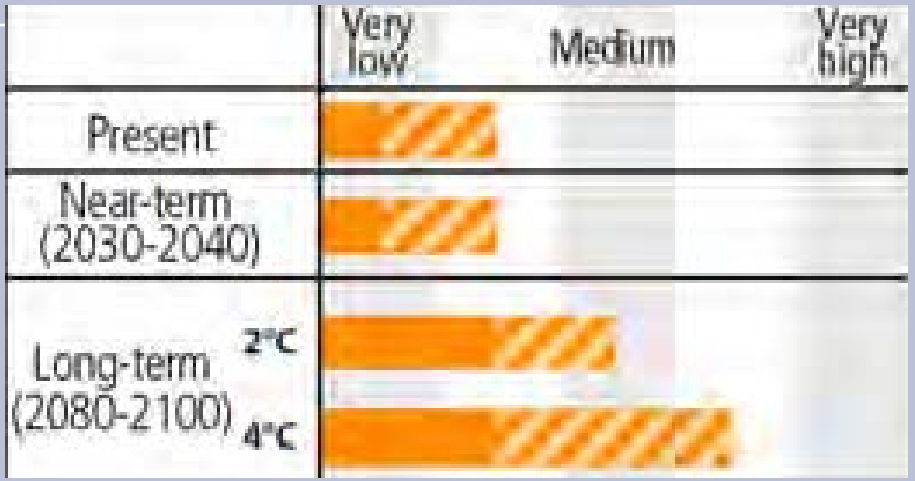
Violent conflict arising from deterioration in resource-dependent livelihoods such as agriculture and pastoralism (*high confidence*)



Adaptation options: Buffering rural incomes against climate shocks, for example through livelihood diversification, income transfers, and social safety net provision; Early warning mechanisms to promote effective risk reduction; Well-established strategies for managing violent conflict that are effective but require significant resources, investment, and political will.

"Despite its economic contributions and environmental advantages, pastoralism in Uganda is besieged by a series of difficult challenges, involving demographic change, land rights, the gazetting of land for protected areas and mineral exploration, and landscape conversion and fencing for areas under development. "

Source: USAID, 2010

"The degree of a country's or society's resilience is pivotal in determining the pathways toward or away from violence."

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"Conflict in Karamoja has roots in a widely shared, aggrieved sense of 'otherness' and marginalization."

"Conflict is almost always the result of the interactions of multiple political, economic, social, historical, and cultural factors, and these must be taken into account in any analysis."

Key Risk– declining work productivity

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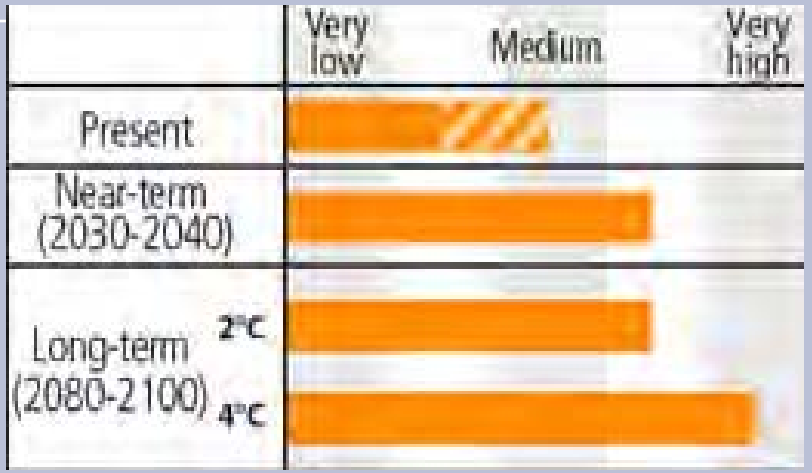
Declining work productivity, morbidity (e.g., dehydration, heat stroke, and heat exhaustion), and mortality from exposure to heat waves. Particularly at risk are agricultural and construction workers as well as children, homeless people, the elderly, and women who have to walk long hours to collect water (*high confidence*)



Adaptation options are limited for people who are dependent on agriculture and cannot afford agricultural machinery. Adaptation options are limited in the construction sector where many poor people work under insecure arrangements. Adaptation limits may be exceeded in certain areas in a +4°C world.

Key risk – Reduced access to water

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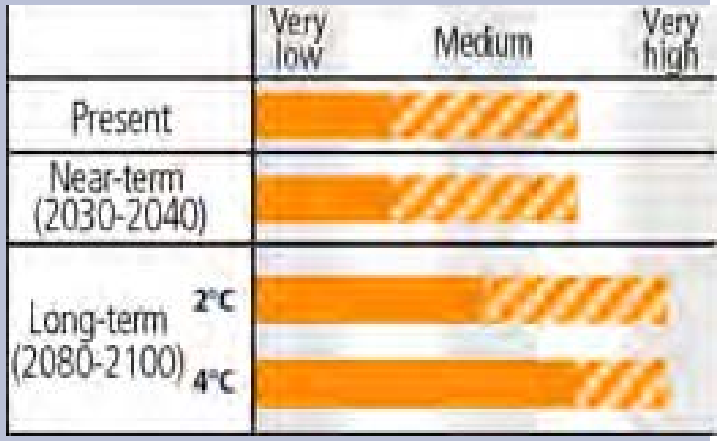
Reduced access to water for rural and urban poor people due to water scarcity and increasing competition for water (*high confidence*)



Adaptation through reducing water use is not an option for the many people already lacking adequate access to safe water. Access to water is subject to various forms of discrimination, for instance due to gender and location. Poor and marginalized water users are unable to compete with water extraction by industries, large-scale agriculture, and other powerful users.

Key risk – Compounded stress

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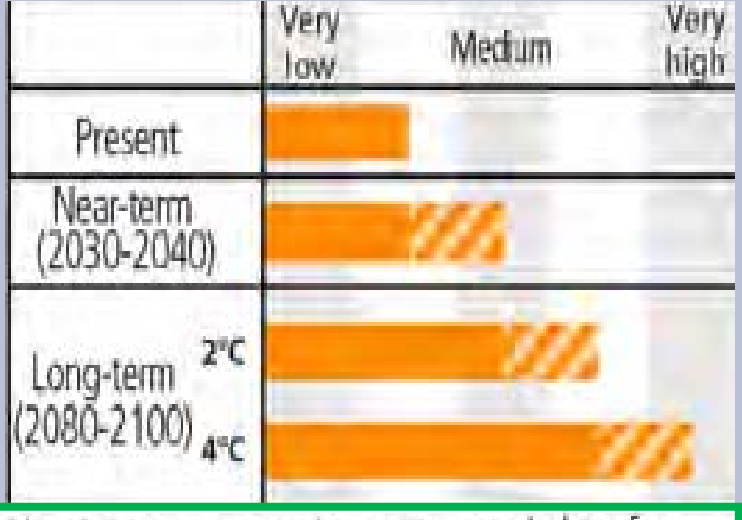
Compounded stress on water resources currently facing significant strain from overexploitation and degradation, and increased future demand, due to temperature rise and changes in precipitation, with highest risks for semi-arid regions (*high confidence*)



Reducing non-climate stressors on water resources is key for realizing adaptation co-benefits. Strengthening institutional capacities for demand management, groundwater assessment, integrated water-wastewater planning, and integrated land and water governance would advance adaptation planning.

Key Risk – Reduced crop productivity

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Reduced crop productivity with strong adverse effects on regional, national, and household food security, due to temperature rise and precipitation changes and to indirect impacts, such as increased pest and disease damage and flooding impacts on food system infrastructure (*high confidence*)

Adaptation options include embedding technological responses (e.g., stress-tolerant crop varieties, irrigation) within efforts to enhance smallholder access to credit and other critical production resources, efforts to diversify livelihoods, and efforts to strengthen institutions at local to regional levels that support agriculture.

Key risk – Disease causing vectors

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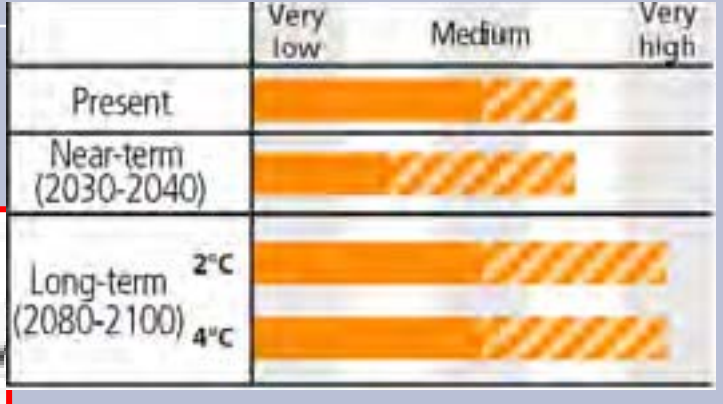

Changes in the incidence and geographic range of vector- and water-borne diseases due to changes in the mean and variability of temperature and precipitation, particularly along the edges of disease distributions (*medium confidence*)

Options: Achieving development goals, particularly improved access to safe water and improved sanitation, along with enhancement of public health functions; vulnerability mapping; early warning systems; coordination activities with other sectors.

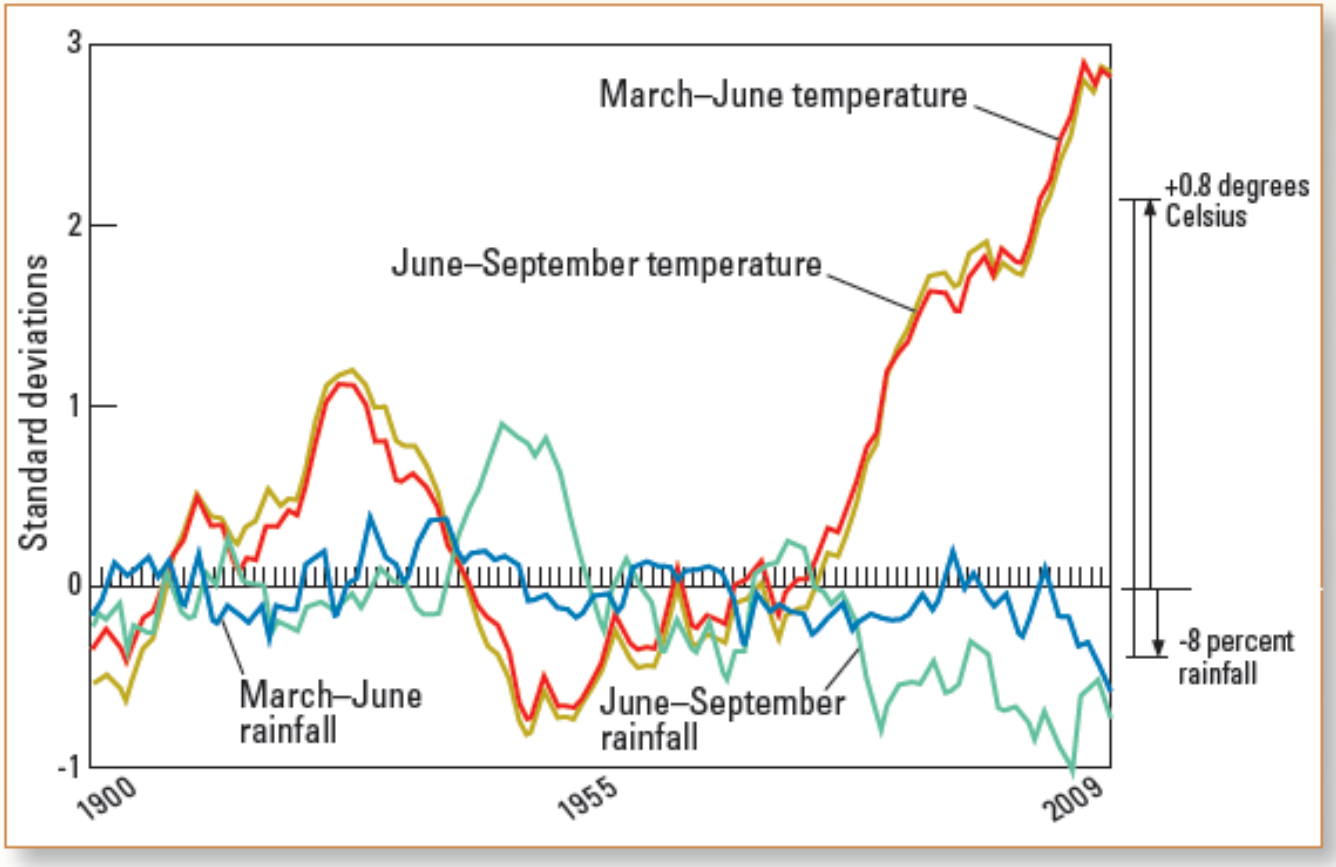

Figure 2. Smoothed 1900–2009 March–June and June–September rainfall and air temperature time series for crop-growing regions.

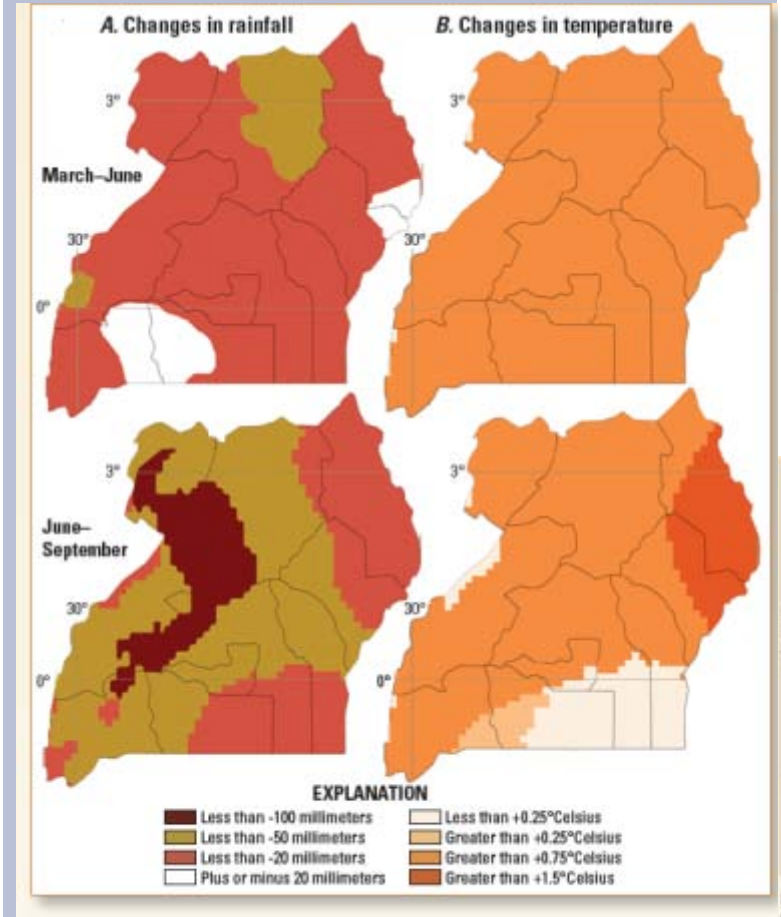

Figure 3. Observed (1960–2009) and projected (2010–2039) changes in March–June and June–September rainfall and temperature.

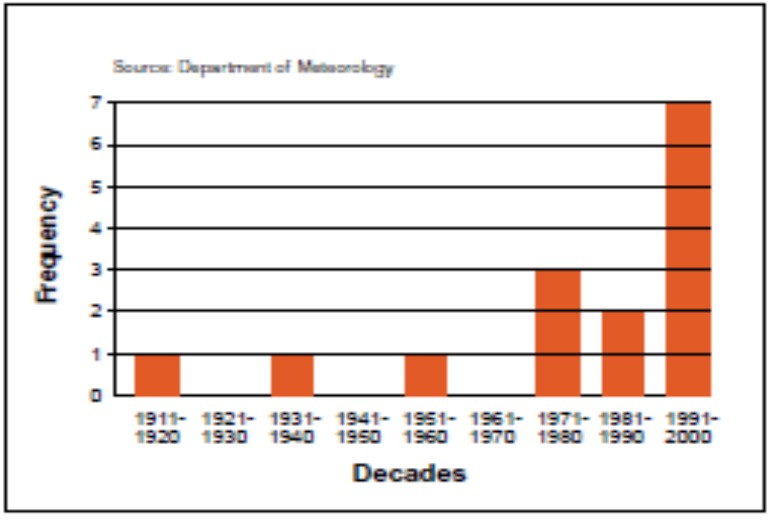

Figure 1: Occurrence of droughts in Uganda

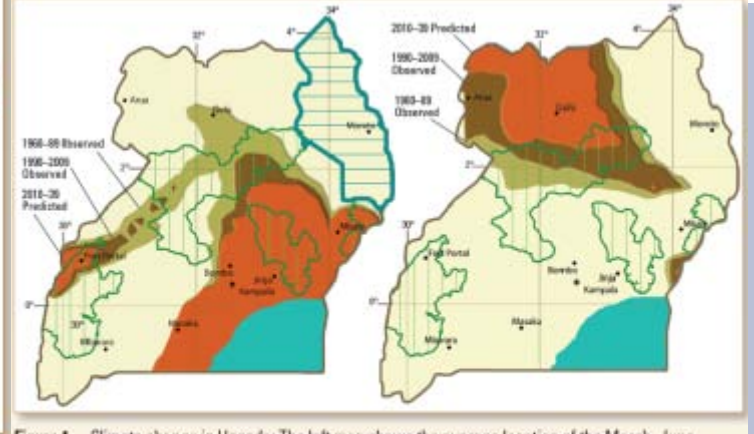

Figure 1. Climate change in Uganda: The left map shows the average location of the March–June 500 mm rainfall isohyets for 1960–1989 (light brown), 1990–2009 (dark brown), and 2010–2039 (predicted, orange). The green polygons in the foreground show the main maize surplus regions; these areas produce most of Uganda's maize. The blue polygon in the upper-right shows the Karamoja region. The right map shows analogous changes for the June–September 500 mm rainfall isohyets.

Effects to Uganda Economy

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- Climate change is one of the greatest challenges affecting Uganda & already causing,
  - ✓ Food insecurity,
  - ✓ Landslides and soil erosion,
  - ✓ Water shortages and quality changes,
  - ✓ Energy insecurity,
  - ✓ Biodiversity loss,
  - ✓ Climate-related disasters,
  - ✓ Conflict due to resource scarcity and forced migration,
  - ✓ Disease pattern shifts.

What should be done

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A. Vulnerability reduction through development and planning: *Including many low-regrets options*

B. Adaptation: *Including incremental and transformational adjustments*

C. Transformation

D. Mitigation

Options in totality

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- ✓Human development options
- ✓Poverty reduction option
- ✓Engineered & built-environmental options
- ✓Technological options
- ✓Ecosystems based options
- ✓Services options
- ✓Laws & regulations options
- ✓Governance policies & programmes
- ✓Educational options
- ✓Behavioral options
- ✓Political options
- ✓Personal options

Options in totality ……..

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- ✓Human development options
  - ➢Education, nutrition, health facilities, social support, reduce gender inequality & marginalization
- ✓Poverty reduction option
  - ➢Insurance schemes, social protection, disaster risk reduction, improve access & control of local resources, favourable land tenure
- ✓Livelihood security & Disaster management
  - ➢Income & assets diversification, improved infrastructures, access to technology, access to decision making fora, enhance agency

Options in totality cont…..

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- ✓Engineered & built-environmental options
  - ➢Flood/cyclone shelters, water serving, assisted migration/translocation, ex-situ conservation, green infrastructures,
- ✓Spatial land use planning
  - ➢Provision adequate houses, infrastructure & services, manage development high risk areas,
- ✓Ecosystems based options
  - ➢Ecological restoration, reforestation, green infrastructures (trees, shades), contrroling over fishing, maintain seed banks

Options in totality cont….

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- ✓Services options
  - Social safety nets; food banks; municipal services; water sanitations; vaccination programmes; public health; emergency medical services
- ✓Laws & regulations options
  - Land zoning, building standards, water regulations & agreements, laws to support disaster & risk mgt, law to encourage insurances plans, with defined property right & land tenure security, patent tools & technology transfer

CHRISTINE MATAYA

ABOVE: Thousands of bags of charcoal are trucked from Nakaseke to Kampala every day.

Options in totality ……

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- ✓ Governance policies & programmes
  - National, regional, county & village plans; urban up-grading plans; municipal water mgt plans; disaster planning & awareness; integrated water resource mgt; ecosystem based mgt; community based mgt
- ✓ Educational options
  - Awareness raising & integrate with education; gender equality; extension services; sharing local & traditional knowledge; participatory action research

Options in totality cont….

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- ✓ Behavioral options
  - ➢ Household preparation & evacuation plans; migration; SWC, livelihood diversification; change cropping, livestock, aquaculture practices, social networks
- ✓ Political options
  - ➢ Change system that contribute to risk & vulnerability; delay practical transformation
- ✓ Personal options
  - ➢ Individual & collective assumption; beliefs, values that influence climate change reponses

Role of markets, climate change & adaptation

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- Well-functioning markets provide an additional mechanism for adaptation and thus tend to reduce negative impacts and increase positive ones for any specific sector or country
- The impacts of climate on one sector of the economy of one country in turn affect other sectors and other countries though product and input markets. Markets increase overall welfare, but not necessarily welfare in every sector and country

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Conclusion

Climate change interacts with other factors/sectors and amplify existing stress on livelihoods, which will add to the vulnerability of those working in economic sectors (e.g. agriculture), thus will multiply existing threats to food, health, transport, financial services, energy, and economic security for the wider population:

THE FUTURE DEPEND ON WHAT WE DO NOW

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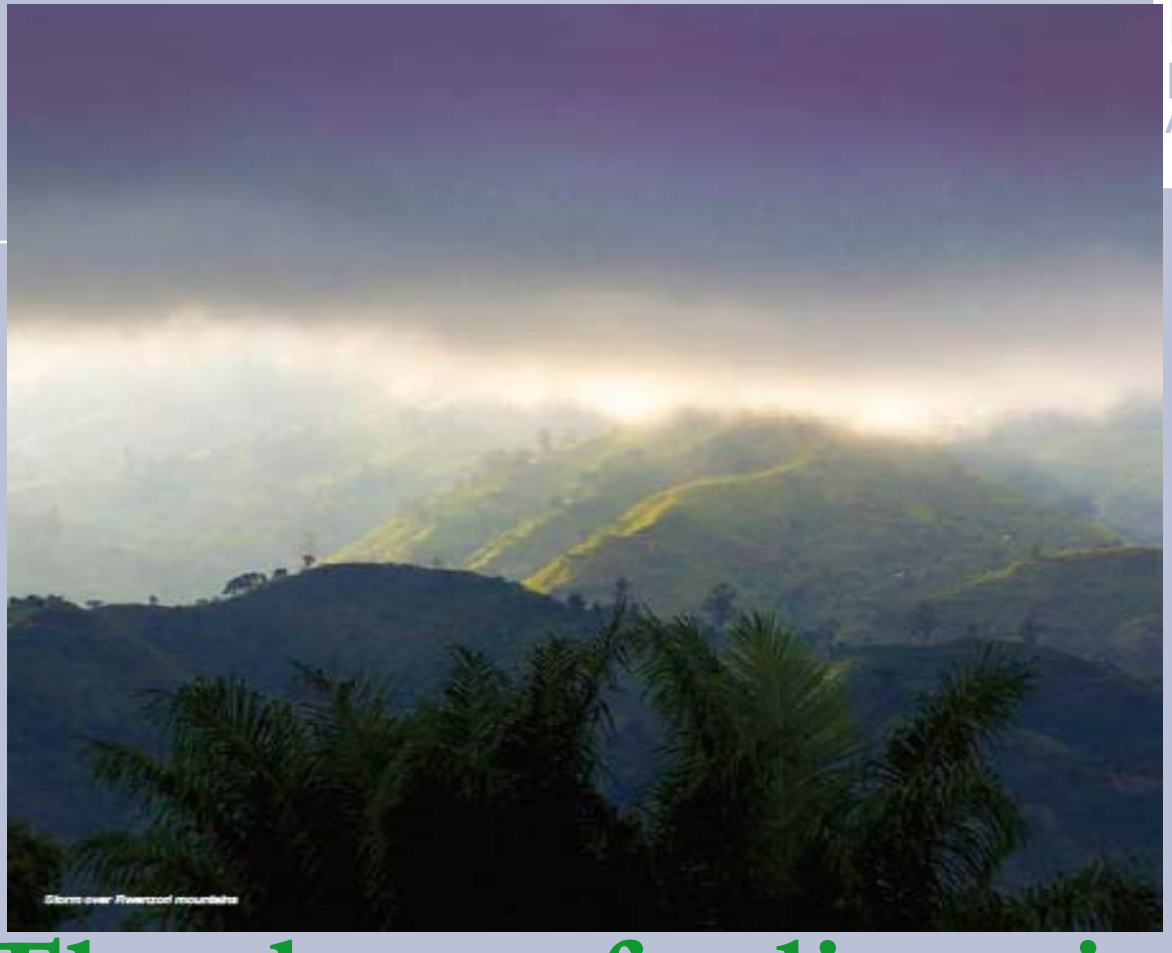

Thank you for listening