UNFCCC expert meeting on a range of approaches to address loss and damages associated with the adverse effects of climate change, including impacts related to extreme weather and slow onset events

Climate-related risks that are most relevant to African context

The IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation

Dr. Balgis Osman-Elasha
A changing climate leads to changes in extreme weather and climate events
Impacts from weather and climate events depend on:

- **nature and severity of event**
- **vulnerability**
- **exposure**
Socioeconomic development interacts with natural climate variations and human-caused climate change to influence disaster risk.

**Disaster Risk:**
the likelihood of severe alterations in the normal functioning of a community or society due to weather or climate events interacting with vulnerable social conditions.

**Vulnerability:**
the predisposition of a person or group to be adversely affected.
- **Drought**: Africa Sahel drought – severe famines, human losses, livestock losses.
- A 14% reduction in rainfall is projected to cause losses of around US$4.65 billion to Cameroon’s economy which is highly dependent on rain-fed.
- **Floods**: generally beneficial but with poor infrastructure and health services it can be devastating (Mozambique and Somali).
- **Heat Stress**: Particularly in urban areas- can impact agricultural crops and human health.
- **Tropical Cyclones**: largest increase in physical exposure to TC e.g. Madagascar & Mozambique)- projected SLR is expected to compound TC surge impacts.
Climate Extremes
Increasing frequency & intensity

• Disasters are appearing in everyday news
• in Africa the deadliest weather disasters are droughts followed by famines.
• From October 2010 to September 2011, a severe drought in the Horn of Africa caused widespread famine and large-scale migratory movements, particularly in Somalia and Kenya.
• Around 80 percent of the livestock of Somalia’s nomadic population died, some 13 million people required humanitarian aid, and an estimated 50,000 people lost their lives.
## Observed Changes in Climate Extremes Affecting Africa

Table 1 shows observed changes in temperature and precipitation extremes, including dryness in regions of Africa since 1960, with the period 1981-1990 used as a baseline (see Box 3.1 in Chapter 3 of SREX for more information).

<table>
<thead>
<tr>
<th>Region and Sub-region</th>
<th>Trends in Maximum Temperature (Warm and Cold Days)</th>
<th>Trends in Minimum Temperature (Warm and Cold Nights)</th>
<th>Trends in Heat Waves/Warm Spells</th>
<th>Trends in Heavy Precipitation (Rain, Snow)</th>
<th>Trends in Dryness and Drought</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Africa</td>
<td>Significant increase in temperature of warmest day and coolest day in large parts; insufficient evidence in others</td>
<td>Decreasing frequency of warm nights, decrease in cold nights in large parts; insufficient evidence in others</td>
<td>Insufficient evidence for most of the region</td>
<td>Precipitation from heavy rainfall events decreased in many areas, rainfall intensity increased</td>
<td>Increased dry spell duration, greater inter-annual variation in recent years</td>
</tr>
<tr>
<td>East Africa</td>
<td>Lack of evidence due to lack of literature and spatially non-uniform trends</td>
<td>Spatially varying trends in most areas, increase in warm nights in southern tip (decrease in cold nights)</td>
<td>Insufficient evidence</td>
<td>Insufficient evidence</td>
<td>Spatially varying trends in dryness</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Increase in warm days (decrease in cold days)</td>
<td>Increase in warm days (decrease in cold nights)</td>
<td>Insufficient evidence</td>
<td>Increase in warm spell duration</td>
<td>General increase in dryness</td>
</tr>
<tr>
<td>Sahara</td>
<td>Lack of literature</td>
<td>Increase in warm nights</td>
<td>Lack of literature on trends in cold nights</td>
<td>Insufficient evidence</td>
<td>Limited data, spatial variation of the trends</td>
</tr>
</tbody>
</table>
Projected Changes in climate extremes affecting Africa

Table 2 shows projected changes in temperature and precipitation extremes, including dryness, in Africa. The projections are for the period 2071-2100 (compared with 1961-1990) or 2080-2100 (compared with 1980-2000) and are based on GCM and RCM outputs run under the A2/A1B emissions scenario.

<table>
<thead>
<tr>
<th>Region and Sub-region</th>
<th>Trends in maximum temperature (the frequency of warm and cold days)</th>
<th>Trends in minimum temperature (the frequency of warm and cold nights)</th>
<th>Trends in heat waves/ warm spells</th>
<th>Trends in heavy precipitation (rain, snow)</th>
<th>Trends in dryness and drought</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Africa</td>
<td>Likely increase in warm days (decrease in cold days)</td>
<td>Likely increase in warm nights (decrease in cold nights)</td>
<td>Likely more frequent and/or longer heat waves and warm spells</td>
<td>Slight or no change in heavy precipitation indications in most areas</td>
<td>Consistent signal</td>
</tr>
<tr>
<td>East Africa</td>
<td>Likely increase in warm days (decrease in cold days)</td>
<td>Likely increase in warm nights (decrease in cold nights)</td>
<td>Likely more frequent and/or longer heat waves and warm spells</td>
<td>Decreasing dryness in large areas</td>
<td>Consistent increase in area of drought</td>
</tr>
<tr>
<td>Southern Africa</td>
<td>Likely increase in warm days (decrease in cold days)</td>
<td>Likely increase in warm nights (decrease in cold nights)</td>
<td>Likely more frequent and/or longer heat waves and warm spells</td>
<td>Low agreement in signal for region as a whole</td>
<td>Consistent increase in area of dryness, except eastern part</td>
</tr>
<tr>
<td>Sahara</td>
<td>Likely increase in warm days (decrease in cold days)</td>
<td>Likely increase in warm nights (decrease in cold nights)</td>
<td>Likely more frequent and/or longer heat waves and warm spells</td>
<td>Increase in dryness, except eastern part</td>
<td>Low agreement</td>
</tr>
</tbody>
</table>

Inconsistent signal
Weather and climate related disasters and regional average impacts (damages in US$ billion) from 2000-2008
Risk Factors

- rapid growth of informal settlements
- weak building construction
- settlements built near rivers and blocked drainage areas

Risk Management/Adaptation

- reduce poverty
- strengthen buildings
- improve drainage and sewage
- early warning systems

Projected: likely increase in heavy precipitation in East Africa
Risk Factors

- more variable rain
- population growth
- ecosystem degradation
- poor health and education systems

Risk Management & Adaptation

- improved water management
- sustainable farming practice
- drought-resistant crops
- drought forecasting

Projected: low confidence in drought projections for West Africa
Risk Management & Adaptation

Key messages
The need to integrate DRM& CCA in the development processes.
Trends in vulnerability and exposure are major drivers of changes in disaster risk 
(high confidence)

- Understanding the multi-faceted nature of both vulnerability and exposure is a prerequisite for designing and implementing effective adaptation & DRM strategies.
- Vulnerability reduction is a core common element of adaptation and disaster risk management.
Integration of local knowledge with external scientific and technical knowledge can improve local participation in DRR& CC adaptation (high agreement, robust evidence)

- Community-Based adaptation can benefit management of DR and climate extremes, but is constrained by the availability of human and financial capital and of DR and climate information customized for local stakeholders.

Local community from W,Sudan
Explicit characterization of uncertainty and complexity strengthens risk communication.

Effective risk communication requires exchanging, sharing, and integrating knowledge about climate-related risks among all stakeholder groups.

Among individual stakeholders and groups, perceptions of risk are driven by psychological and cultural factors, values, and belief.
Inequalities influence local coping and adaptive capacity, & pose challenges to DRM & adaptation (high agreement, robust evidence)

- These inequalities reflect socioeconomic, demographic, and health-related differences and differences in access to livelihoods and entitlements.

A woman from East Sudan  
A woman carrying Barely-Souss-Morocco  
Nomads in Central Sudan
Risk sharing and transfer mechanisms can increase resilience to climate extremes at local, national, and international scales

- Insurance and other forms of risk transfer are linked to DRR& CC adaptation by providing means to finance relief, recovery of livelihoods, and reconstruction, reducing vulnerability & providing knowledge and incentives for reducing risk.
- Uptake of formal risk sharing and transfer mechanisms is unequally distributed across regions and hazards
Attention to the **temporal & spatial dynamics of vulnerability & exposure** is important given that the design & implementation of adaptation & DRM strategies can **reduce risk in the short term, but may increase vulnerability & exposure over the longer term.**

*(high agreement, medium evidence)*

patterns that may increase risk in the long-term
Low-regrets measures for current DRM are entry points for addressing projected trends in exposure, vulnerability, as they have the potential to offer benefits now and lay the foundation for addressing projected changes (high agreement, medium evidence).

- Many of these low-regrets strategies produce co-benefits, help address other development goals, such as improvements in livelihoods, human well-being, and biodiversity & help minimize the scope for maladaptation.
Closer integration of DRM & Adaptation, along with the incorporation of both into local, national, & international development policies & practices, will provide benefits at all scales (high agreement, medium evidence)
Thanks

for more information

http://www.ipcc.ch/