

Climate Change Adaptation and ICTs

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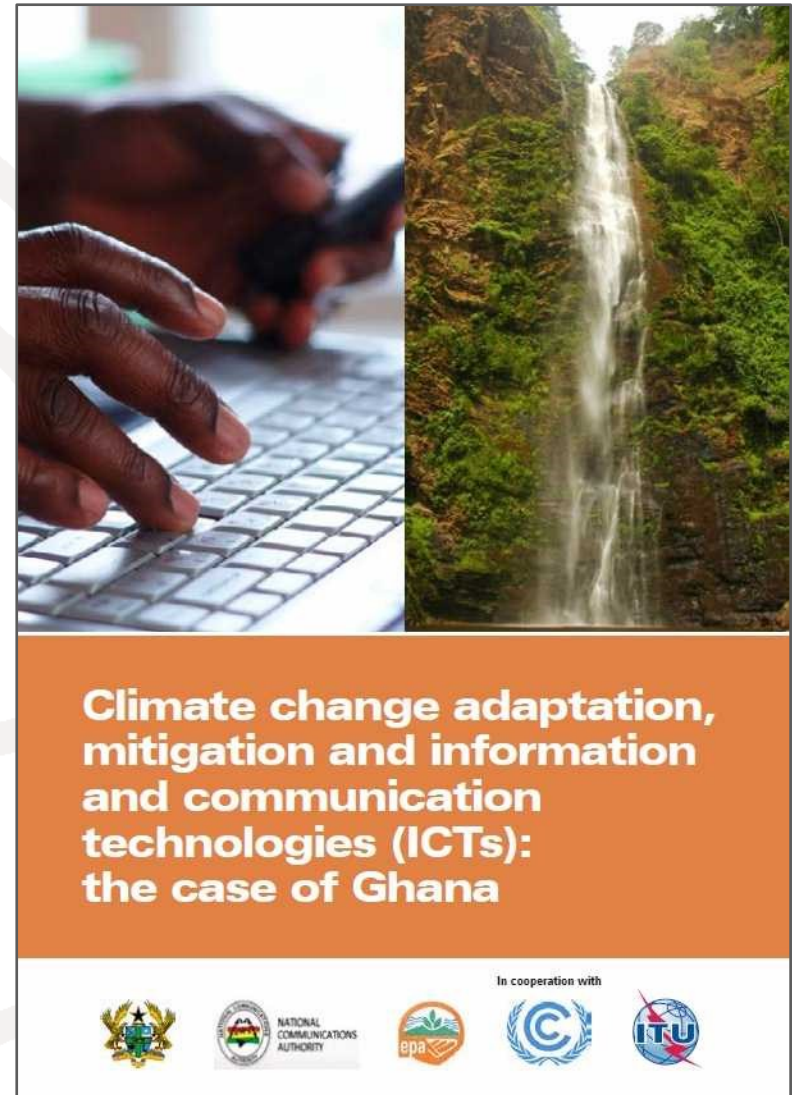
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Objectives

- Present results of the report “Climate Change Adaptation and ICTs: the Case of Ghana”
- Request input to a draft report “Resilient Pathways: the Adaptation of the ICT Sector to Climate Change”

<http://www.itu.int/ITU-T/climatechange/report-ghana.html>



“Climate Change Adaptation and ICTs: the Case of Ghana”



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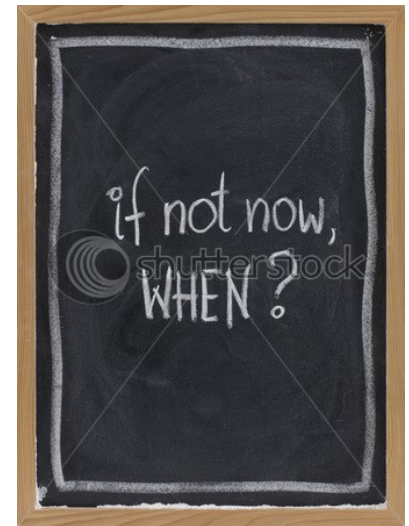


Background

ICT plays a critical role for:

- Mitigation
- **Adaptation**
- Capacity building
- Technology transfer

Overall ICT impacts every facet of human life – it is a driving engine for socio-economic development



Background

- ITU's Sixth Symposium on ICTs, the Environment and Climate Change, Ghana, 7th-8th July 2011.
- Accra Call to Action: Recognition of ICT's role in Adaptation, Mitigation, Capacity Building and Technology Transfer:

- *Enhance the transformational role of ICT for climate change adaptation and disaster risk reduction, will require the use of three technology types: **telecommunication systems, observation systems, and information systems.***
- *Recognize that there is **need to build capacities** in developing countries to support ICT as tool for climate change adaptation and DRR. Capacity development is required in three dimensions - **institutional development, human resources enhancement and systems development**, in particular, relating to **legislative and regulatory frameworks.***
- ***Forge partnerships** and engage all stakeholders to address climate change, due to its multi-disciplinary nature, is critical.*

ITU Project in Ghana

**“Climate Change
Adaptation, Mitigation
and ICTs:
The Case of Ghana”**



Key Stakeholders:

Agencies



International
Telecommunication
Union (ITU)



Republic of Ghana

Ministry of
Communications



NATIONAL
COMMUNICATIONS
AUTHORITY



Environmental
Protection Agency

Sponsors



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“Climate Change **Adaptation**, and ICTs: the Case of Ghana”

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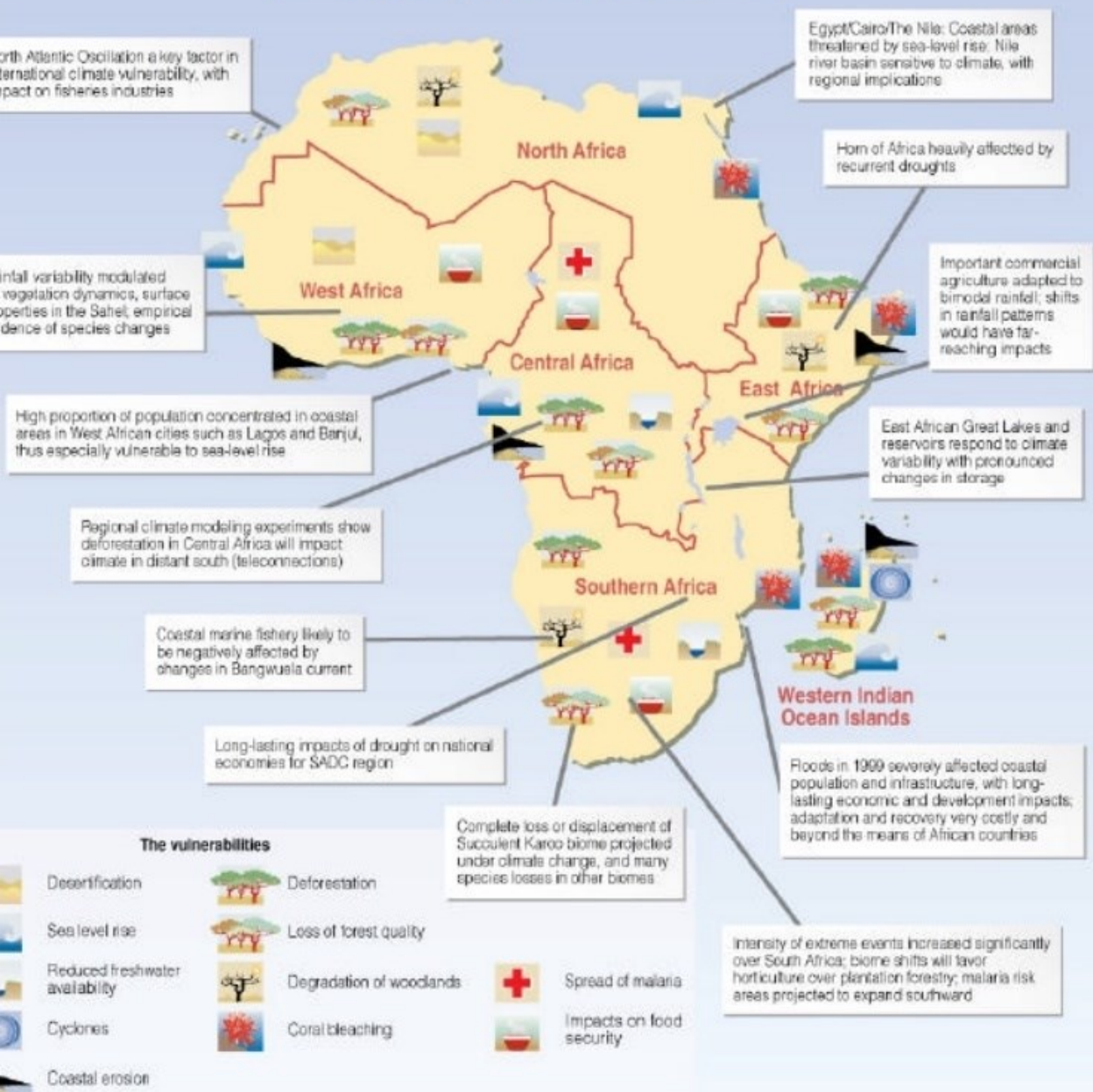


Climate Change: What is Adaptation?

- Adaptation (UNFCCC): Actions taken to help communities and ecosystems cope with changing climate conditions, such as
 - construction of flood walls to protect property from stronger storms and heavier precipitation
 - planting of agricultural crops and trees more suited to warmer temperatures and drier soil conditions

Source: <http://www.eird.org/cd/on-better-terms/docs/Organisation-of-Economic-Co-operation-and-Development.pdf>

Climate Change Vulnerability in Africa



Impacts of climate change



Climate change projections for Ghana (AR4)

- Temperature projected increase
 - 1.0 to 3.0°C by the 2060s
 - 1.5 to 5.2°C by the 2090s
 - more rapid changes will be in the north rather than in the coastal region
- Precipitation
 - half the models project an increase
 - half project a decrease
 - But - We expect and are experiencing more irregular and extreme wet and dry seasons
- Sea-level rise
 - 0.13 to 0.56 metres by 2090 (relative to 1990)
 - But – storm surges will be more severe



Climate change impacts for Ghana

*"Africa's contribution to greenhouse gases is low; however the continent is suffering the most in terms of the **effects of climate change.**"*

***Cocoa** for instance could become a rare crop in the next 15 years if something is not done to reverse the effects of climate change."*

H.E. John Dramani Mahama, President, Ghana

- The **rainfall pattern** is affecting **cocoa** and maize production, among others, affecting **livelihoods and food security.**
- Pressure on **water resources**
- Human **health and infrastructure**





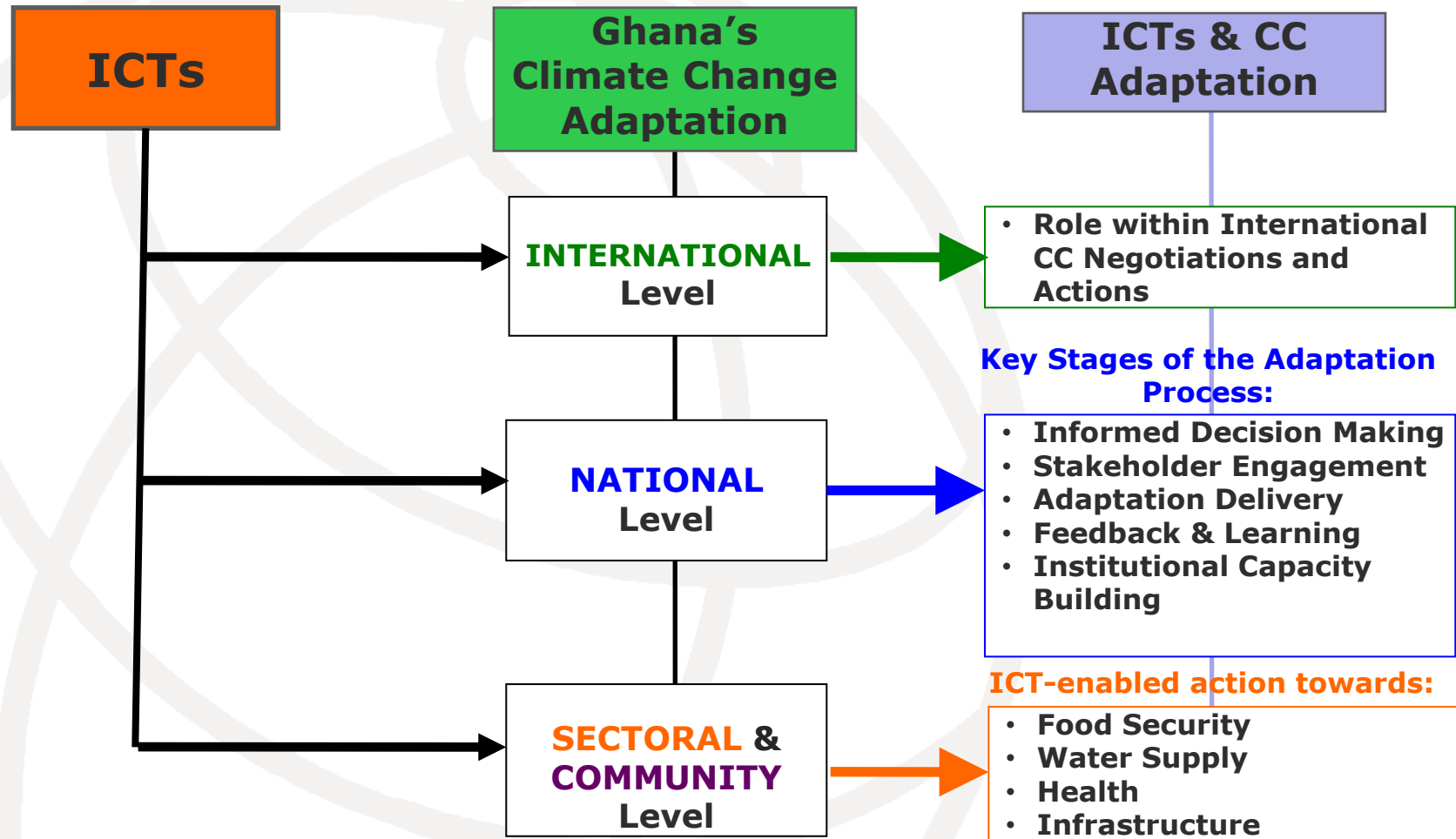
Ghana & UNFCCC

- Ghana signed the United Nations Framework Convention on Climate Change (UNFCCC) at the Rio de Janeiro Earth summit in June 1992 and ratified same on 5 September 1995.
- The Kyoto Protocol to the UNFCCC was also ratified on 16 November 2002. The instrument of ratification was deposited at the United Nations Headquarters in New York in March 2003.

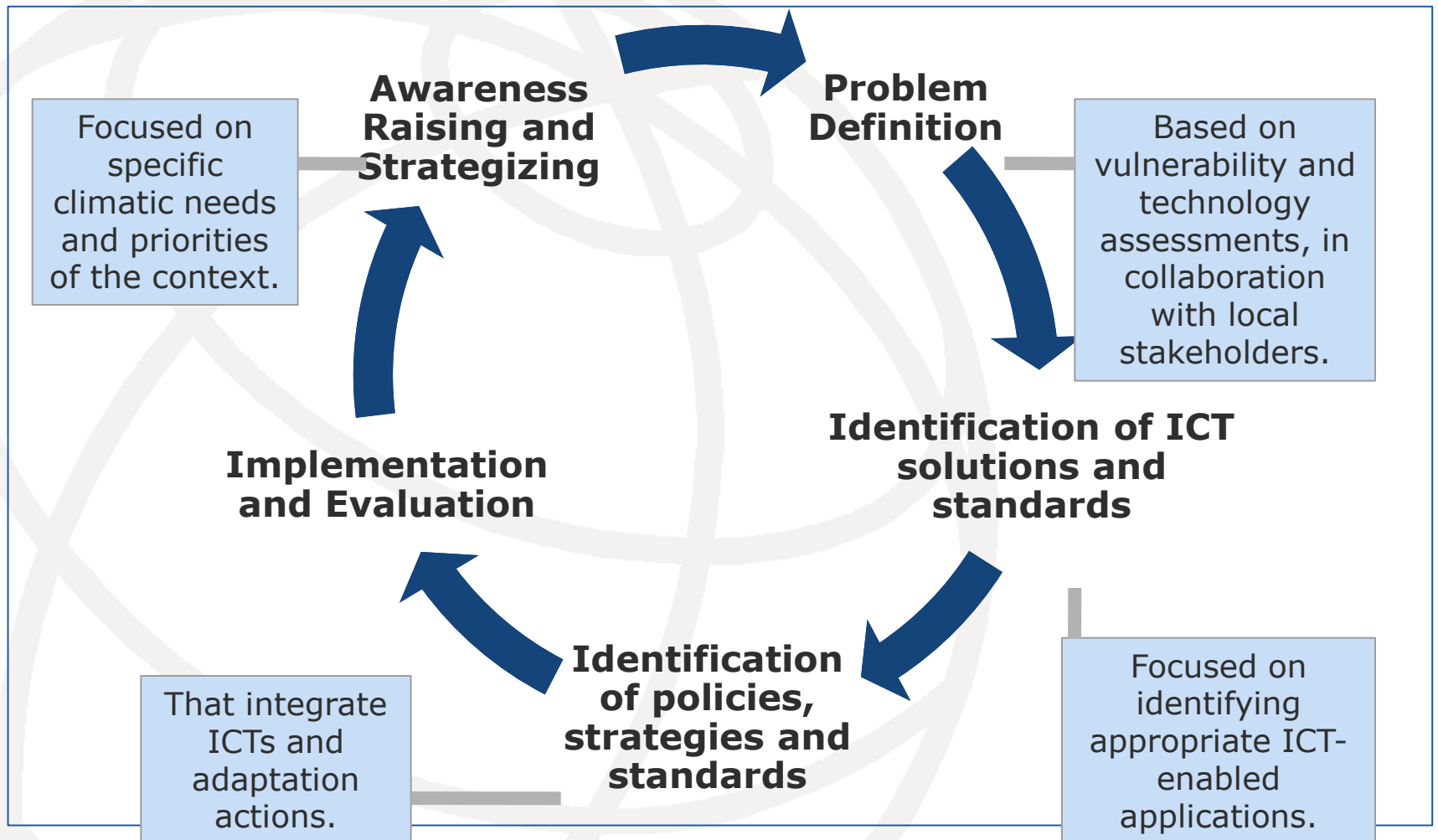
Key ICT Sector Developments

- Rapid growth in **mobile penetration**
- Increasing availability of, and falling prices for, **international bandwidth**
- Development of the **Ghana Internet Exchange (GIX)**
- New **e-government** telecommunications infrastructure
- Deployment of the Ghanaian government's new **data centre**

ICT and CC Adaptation at Different Levels: The Case of Ghana



Policy Process for the Integration of ICTs and CC



New mandated work that will require ICTs

Cancun Adaptation Framework

National Adaptation Plans (NAPs)

- Medium- and long-term adaptation
- National level comprehensive planning and implementation
- NAP guidelines, possibility for embracing appropriate and context specific ICTs e.g. community radio, cell phones, etc.

Work Programme on Loss and Damage

- Strong early warning component
- Potential for ICTs as a means to rapidly communicate about extreme events.

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How does ICT feature in climate change adaptation?

- ICT provides the fastest and most reliable way of gathering and disseminating information concerning adaptation to climate change to those who need it
 - E.g. satellite monitoring of the earth for weather forecasting
 - E.g. alerting communities of extreme weather and/or long term trends
- ICT is used to optimise the performance of physical systems in a changing climate-e.g. water management
 - E.g. Routing of fresh water supplies from reservoirs using sluice gates (to avoid overflow and wastage)
 - E.g. Automatic crop watering systems to avoid wastage

ICT and Climate Change: Where next for Africa?

- Adaptation
 - Good communications are needed throughout to allow populations and communities to increase their knowledge and minimise climate change risks
 - Plan ahead for the next 100 years of climate change
 - Ensure that UNFCCC, ITU (and other) regional reports on climate change adaptation are interpreted for use by local communities
 - Make maximum use of mobile telephony systems
 - Aim for 100% coverage. Use satellite for 'not-spots'
 - Use both narrowband (e.g. for alerts) and broadband solutions (e.g. for capacity building)
 - Plan for ubiquitous use of smart phones

Network evolution options for 'Capacity Building'

- Extend the coverage of mobile networks to rural areas
 - E.g. high antenna location, high antenna gain
 - powered by solar arrays, wind turbines, renewable diesel
 - or use VSAT for community WiFi
- Upgrade the existing mobile infrastructure for broadband
 - adopting renewable power sources
- Extend electricity supply network together with fibre optic cable, sharing cost of infrastructure
 - use WiFi to share services at the edge of the network

Conclusion: Key Areas of Action

- **No single ICT solution**, but flexible, combined approaches that prioritize the most appropriate technologies for the local context.
- **Key ICT functions:** observation, analysis, planning, implementation and management, capacity building and networking.
- **Design and implementation of long-term strategies** that integrate issues of ICT and climate change **content, structures** and **process**.
- Continue to **raise awareness** on ICTs' adaptation and mitigation potential.

Next Steps

- **Monitor, document, improve** ICTs' integration into CC adaptation strategies: **Research AND Practice**
- **Support other developing countries/case studies:** good practices, alternative approaches and areas for future action.
- Continue to **raise awareness** and to **build multi-sectorial partnerships** to strengthen ICTs and climate change adaptation strategies.

Way Forward

- **Success of ICT in climate change solutions will depend to a large degree on stronger cooperation**
 - increased cooperation between governments and the private sector
 - necessary policies and public finance to drive creativity.
 - frameworks and partnerships especially as it concerns adaptation - at community and local level.
 - ITU, is the global platform
- ICT is critical in assisting countries to fulfil policy goals in a standardized, accountable and verifiable way
 - ITU-T Q15/5

Links & Additional Information

- Report
<http://www.itu.int/ITU-T/climatechange/report-ghana.html>
- ITU-T and climate change
<http://www.itu.int/ITU-T/climatechange>
- ITU Symposia & Events on ICTs and Climate Change
<http://www.itu.int/ITU-T/worksem/climatechange>

Climate Change Adaptation- ICT Sector

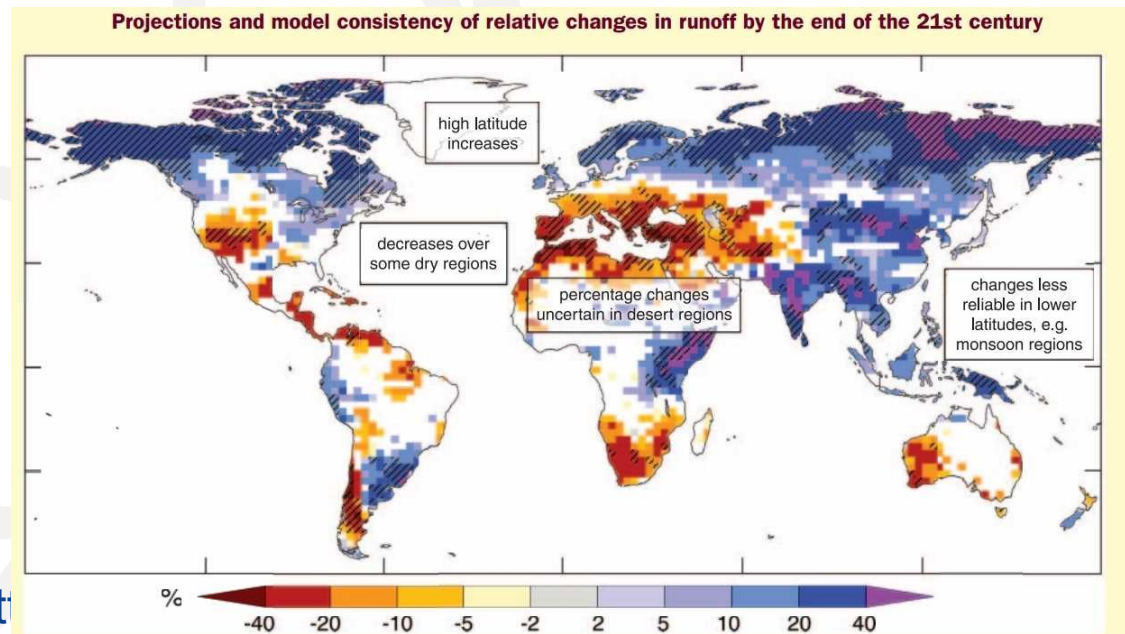
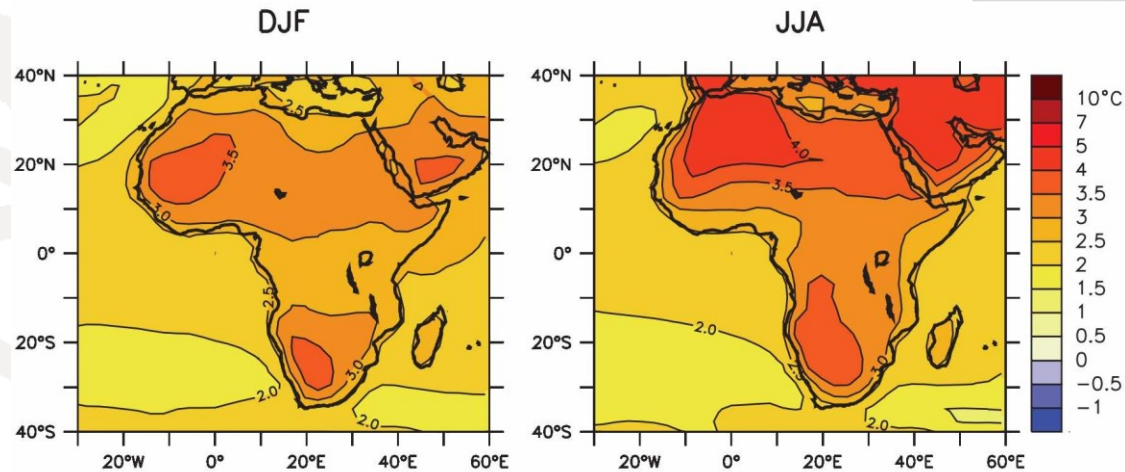
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Climate Change Adaptation- ICT Sector

- Why Consider it?
 - We are dependent on ICT for implementation and maintenance of services across all sectors
 - If ICT fails many other services will fail too
 - Resilience of ICT infrastructure needs to be checked regularly
 - Can it cope with increasingly extreme weather events and long term climate trends?

Climate Change Adaptation-ICT Sector (AR4)

- Possible Impacts on ICT Infrastructure: Some examples
 - Storm/Flood: storm surge, landslide, subsidence
 - Heat wave: solar gain, subsoil cracking, off-mains water, air-conditioning unit loading and servicing
 - Extreme Wind: wind loading, panel and antenna security, tree proximity
 - Humidity control range: Electrical and human limits
- Any one of these can trigger failure of ICT-based services



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Climate Change Adaptation- ICT Sector

- Commissioned by Deutsche Telekom
- Work carried out by University of Manchester and Climate Associates including:
 - Policy perspective
 - ICT impacts
 - Examples of resilience in ICTs
- Would like to include more examples of:
 - Climate Change Risk Assessment Checklists
 - Best Practices (e.g. to ensure resilience)

Resilient Pathways:
The adaptation of the ICT
sector to climate change

A Definition of “Resilience”

- Resilience is understood as the ability of a system or a sector to withstand, recover, adapt, and potentially transform in the face of stressors such as those caused by climate change impacts.
 - Source: Adapted from Ospina and Heeks (2010).

What can we do?

- Ensure that the ICT infrastructure can cope with more severe ranges of temperature, rainfall, wind speed, etc
- Share know how
 - Best Practices (e.g. for increased resilience)
 - Risk assessments
- Carry out Risk Assessments
 - Use a Climate Adaptation Risk Assessment Checklist
- Agree a “Climate Change Adaptation Plan”

Climate Change Risk Assessment Checklists

- Categories
 - Buildings and HVAC
 - Infrastructure and access to it
 - Power Supplies
 - ICT Devices and Systems
 - Routing and End-End Reliability
 - IT Services
 - Workforce
 - Vehicles
 - Propagation (wireless and satellite)
 - Supply Chain
 - ICT end-user services and equipment
- This example is for buildings (Page 1)
 - It is the only category which exists at the moment
- Do you have any examples of CC risk assessments for ICT sector?

ICT Buildings and HVAC

As stated in Section 4.2.1 of this report, an important function of ICT buildings (such as data centres and central offices) is to maintain electronics at a safe operating temperature. Heating, ventilation and air-conditioning systems (HVAC) play a key role in that regard, and should be designed and maintained to keep the ICT equipment within the temperature and humidity limits specified by the manufacturers.

Example

Climate Adaptation Risk Assessment: ICT Buildings and HVAC.

Scope: Exchanges, base stations for mobiles, data centres, repeater stations, transmitter stations.

Risk Assessment to climate extremes.

A1. Flood.

A1(i) Do you have a list of buildings which are vulnerable to flood and a Plan of Action in event of flooding?

A1(ii) Are any of your buildings near or on a slope which could subside?

A1(iii) Does your organization have measures in place to cope with extreme rainfall? (e.g. regularly inspect and clear drains).

A2. Drought

A2(i). Do you have buildings which on land which is liable to crack and become unsafe during an extended heat wave? (e.g. brick buildings)

A2(ii). Do you have sufficient off-mains water to cope with extended drought? (e.g. ponds for use by fire pumps)

A3 Extreme Heat

A3(i). Do you have ICT equipment operating in rooms with windows facing the sun?

A3(ii). Do you have blinds fitted in ICT equipment rooms with windows facing the sun?

A3(iii). Are your air-conditioning units serviced regularly?

A3 (iv). Does the power load in the equipment room exceed the capacity of the air conditioning unit to remove the heat produced?

Can You Help?

- Share examples of:
 - Measures introduced to make your ICT more resilient to climate change - best practices?
 - Climate Change Risk Assessments for ICT
 - Action Plans
- Selected examples will be used to illustrate measures that the sector is undertaking in the field of climate change adaptation in the Report and in ITU-T Recommendations

Can You Help?

Send them to:

david0.faulkner0@ties.itu.int

By 31 October 2013

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