Climate Change and Development: The Adaptation Challenge

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Climate Change and Development: The Adaptation Challenge

- The climate is changing
- Mitigation is critical, but adaptation still needed
- The link with economic growth and development
- Building resilience into development: adaptation in practice
  - Sustainable agriculture
  - Water resource management
  - Disaster risk reduction
The Climate Is Changing

Source: IPCC Synthesis 2007
Risks from climate change, by reason for concern—2001 compared with updated data.

TAR (2001) Reasons For Concern

- Risks to Many
- Large Increase
- Negative for Most Regions; Positive for Others
- Net Negative in All Metrics
- Higher

Updated Reasons For Concern

- Risks to Many
- Large Increase
- Negative for Most Regions; Positive for Others
- Net Negative in All Metrics
- High

Increase in Global Mean Temperature above circa 1990 (°C)

Risks to Some
- Increase
- Distribution of Impacts
- Aggregate Impacts
- Risks of Large Scale Discontinuities
- Risks to Unique and Threatened Systems

Future

Past

Getting to 2 degree trajectory critical, but hard

![Projected annual total global emissions (GtCO₂e)](chart)

- **Business as usual (~5°C)**
- **2°C trajectory**

Developing countries are most at risk

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<th>Drought</th>
<th>Flood</th>
<th>Storm</th>
<th>Coastal 1m</th>
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</table>

Source: World Bank

Low Income

Middle Income
Economic development and growth is critical

In the developing world…

• One quarter live on less that $1.25/day
• 1 billion lack clean drinking water
• 1.4 billion lack electricity
• 3 billion lack sanitation
• One quarter of children malnourished

….and a changing climate will make development even harder…. 
Economic development and growth is critical

As countries and people get richer…

• Economies are less reliant on climate sensitive sectors
• Better functioning private sector
• Stronger government institutions and capabilities
• Enhanced family and community capacity to cope

….but a changing climate will demand new ways of approaching development, with a focus on building resilience and planning for uncertainty
Adaptation in practice

- *Sustainable agriculture*
- Water resource management
- Climate disaster risk reduction
Climate change will depress agricultural yields in most countries by 2050

Improved agricultural and land-use practices can be part of the solution

Global CO2e emissions by sector

Source: IPCC 2007a, figure 2.1.
Sustainable Agriculture: feeding 3 billion more people in a harsher climate

• Boost productivity…..

  » Sustainable practices: zero-tillage; precision fertilizer/water
  » Drought and flood resistant crop varieties
  » Revamped agricultural subsidies
  » Improved water storage and irrigation practices
  » Information: remote sensing; water monitoring; early warning
  » Incentives for soil carbon sequestration, a co-benefit

• While managing the agriculture/forest interface

  ….and investing in indigenous knowledge; research, development and dissemination; policies and incentives
Water availability is projected to change dramatically by the middle of the 21st century.

Adaptation in practice

• Sustainable agriculture

• *Water resource management*

• Climate Disaster risk reduction
The world will also experience more intense rainfall events

Water resource management will be more challenging

- River Basins losing natural supply from ice and snow
- Flooding from deforestation, intense rains and tidal surge
- Reduced run-off and reduced aquifer re-charge
- Greater uncertainty and need for new forms of risk management
- Strategies need to change
  - Need to be robust across a range of future options
  - Increased demand for water storage and flood protection (and multi-purpose use for irrigation and energy)
  - Eco-system approaches (upstream re-forestation)
  - Better information: monitoring systems
Water Resource Management: coping with glacial retreat

Water Resource Management: co-benefits from hydropower in Africa

1.4 Billion poor are without access to modern energy – 585 million live in Africa
Adaptation in practice

- Sustainable agriculture
- Water resource management
- Climate disaster risk reduction
Climate Disaster Risk Reduction: The number of people affected by climate-related disasters is increasing

Climate disaster risk reduction

- “Hard” Measures
  - Smarter infrastructure
  - Eco-systems services: mangroves/re-forestation
  - Coastal zone management and land use planning
- “Soft” Measures
  - Early warning systems
  - Safety nets
  - Community-driven solutions
  - Insurance markets
Climate Disaster Risk Reduction: building coastal resilience in Bangladesh

Climate Disaster Risk Reduction: building coastal resilience in Bangladesh

“Hard” measures

- Rehabilitation of embankments
- Greenbelts to protect embankments from tidal surges
- Improved water supply and sanitation systems
- Climate resilient roads, markets and housing
- Cyclone shelters

“Soft” measures

- Social safety nets that can expand (feeding programs, food for work)
- Community based early warning systems, using cell phones and radios
Climate Disaster Risk Reduction: catastrophic insurance in the Caribbean

Source: Caribbean Catastrophic Risk Insurance Facility (CCRIF) “Enhancing the climate risk and adaption fact base for the Caribbean” (preliminary results of ECA study) August 2010
Climate Disaster Risk Reduction: smarter urban development in East Asia

Sample of Current and Planned Real Estate Projects in Southeast Asia Overlaid on Areas Exposed to Climate Hazards

Notes: Current and planned real estate development projects of the top 11 companies by market capitalization in the region based on best available information from company Web sites and annual reports. This is not a robust mapping of all real estate development projects constructed by these or other companies; it is meant to serve as a sampling of where real estate development is occurring and to demonstrate the presence of current and planned real estate projects in areas exposed to the trends discussed in this report. Please see Appendix 2 for the company data used for this map.

Adaptation: what will it cost?

- $75 - $100 billion/year
  - Equal to today’s global foreign assistance spending
  - Highest overall cost in East Asia and the Pacific, driven by the cost of urban infrastructure
  - Highest cost as a percent of GDP in Sub-Saharan Africa
- Least Developed Countries are looking for financial support
  - They did not cause the problem, but will bear the consequences
What was agreed in Cancun

- A way forward on mitigation – not enough, but a start
- Principles for adaptation responses
- Financing for mitigation and adaptation