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UNEP

Scaling up investment for climate change

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Impacts on Asia and the needs for adaptation

Impacts of climate change in Asia

Agriculture and food supply

Decrease in crop yields up to 30% in Central & South Asia by 2050



Water management

Decrease of freshwater availability affecting more than a billion people by 2050 and changes in river runoff affecting hydropower output



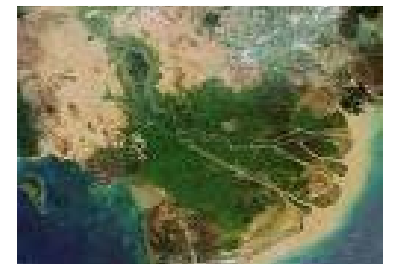
Human health

Endemic morbidity and mortality due to diarrhoeal disease and exacerbation of abundance / toxicity of cholera in South Asia



Coastal areas

Coastal erosion and inundation in heavily-populated megadeltas



Adaptation strategies (1)

Developing **knowledge** on impacts and vulnerabilities

Integrating adaptation in wider policies

Improving **disaster preparedness** and management

Informing and **educating** to enhance the level of awareness and understanding

Improving **health care** systems

Promoting **good governance** including responsible decision making and communities empowerment

Adapting strategies (2)

Adapting agriculture



- Changing crop species
- Changing the allocation of agricultural land
- Improving irrigation systems

Protecting against floods & preventing water scarcity



- Reservoirs and dykes
- Warning systems
- Restoring vegetation
- Reusing wastewater

Investment needs for adaptation

More **extensive adaptation** than is currently occurring is required to reduce vulnerability to future climate change

Comprehensive **estimates** of adaptation costs and benefits are still needed

- For a one-metre sea level rise, global protection costs could amount to \$1 trillion

✘ Poverty is the largest barrier to developing the capacity to cope and adapt

Adaptation is necessary to address impacts resulting from the warming which is already unavoidable due to past emissions

But **adaptation alone cannot cope** with all the projected impacts of climate change

► **Need for a mix of strategies including adaptation and mitigation of GHG emissions**

The needs for mitigation

Stabilisation scenarios

Global mean temp. increase (°C)	Stabilization level (ppm CO ₂ -eq)	Year CO ₂ needs to peak
2.0 – 2.4	445 – 490	2000 – 2015
2.4 – 2.8	490 – 535	2000 – 2020
2.8 – 3.2	535 – 590	2010 – 2030
3.2 – 4.0	590 – 710	2020 – 2060



All stabilisation levels assessed can be achieved by deployment of a portfolio of **technologies that are currently available or expected to be commercialised** in coming decades

This assumes appropriate and effective **incentives** are in place for their development, acquisition, deployment and diffusion



Scale of investment needs in energy

To meet growing demand, **\$20 trillion** will be invested in energy supplies up to 2030 globally

- Projected cumulative investments in energy supply infrastructure amounts to \$3.7 trillion in China and \$1.2 trillion in India over 2006-2030, $\frac{3}{4}$ in the power sector*

Significantly de-carbonising power production would require incremental investments of up to **\$40 billion** per year globally, of which \$30 billion per year in non-OECD countries

- This would be offset by the reduced investment requirements resulting from improved end-use efficiency

Key areas of investment needs

Energy efficiency

- An increased investment of \$2.4 trillion in improved efficiency would be more than offset by \$3 trillion savings in supply investments

Renewable energy

- In China, renewable energies are expected to provide more than 30% of needs by 2050

Clean power generation

- China's and India's reliance on coal makes future implementation of CCS essential

The role of Clean Development Mechanism (CDM)

In rapidly developing countries, the CDM is currently the **principal economic incentive** to de-carbonise new investments

The structure of power sectors could be radically different depending upon the **value of Certified Emission Reduction (CER)** units

- CER of 20 \$/tCO₂ from 2006 onwards could drive a radical switch of investment from new coal plants to natural gas and renewables in developing Asia
- This would represent a large saving in CO₂ emission, but also a totally different capital endowment that would sustain far lower emission trajectories after 2030

Role of stakeholders

Regulation has been the major growth driver for many clean technologies and helped to bring costs down

- Growing price of carbon on EU carbon market has encouraged businesses to consider new opportunities, driving Europe towards technological leadership

Private capital represents 90% of all investment capital in clean and renewable energy*

- Stakeholders must create an environment that attracts private sector investment required into clean energy*

Development finance institutions must play a prominent role in helping developing countries stimulate greater investment flows into clean energy and mitigating associated risks*

*There are risks and costs
to a program of action.
But they are far less than the
long-range risks and costs
of comfortable inaction.*

*- John F.
Kennedy*