



Climate Change Adaptation

Understanding adaptation and its current challenges – An overview

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...not just adaptation



- What is adaptation?
- IPCC: The process of adjustment to actual or expected climate and its effects
- Consider the issue of weather proofing yourself from increasing frequency of droughts
 - land and water resource conservation, tree plantations, diversify livelihoods
- Have benefits in the absence of climate change, but more so with climate change

Development to Adaptation



FIGURE 1. A Continuum of Adaptation Activities: From Development to Climate Change



Source: McGray et al. (2007, p. 18)

...therefore 'adaptation' is not just adaptation!

Unwrapping adaptation



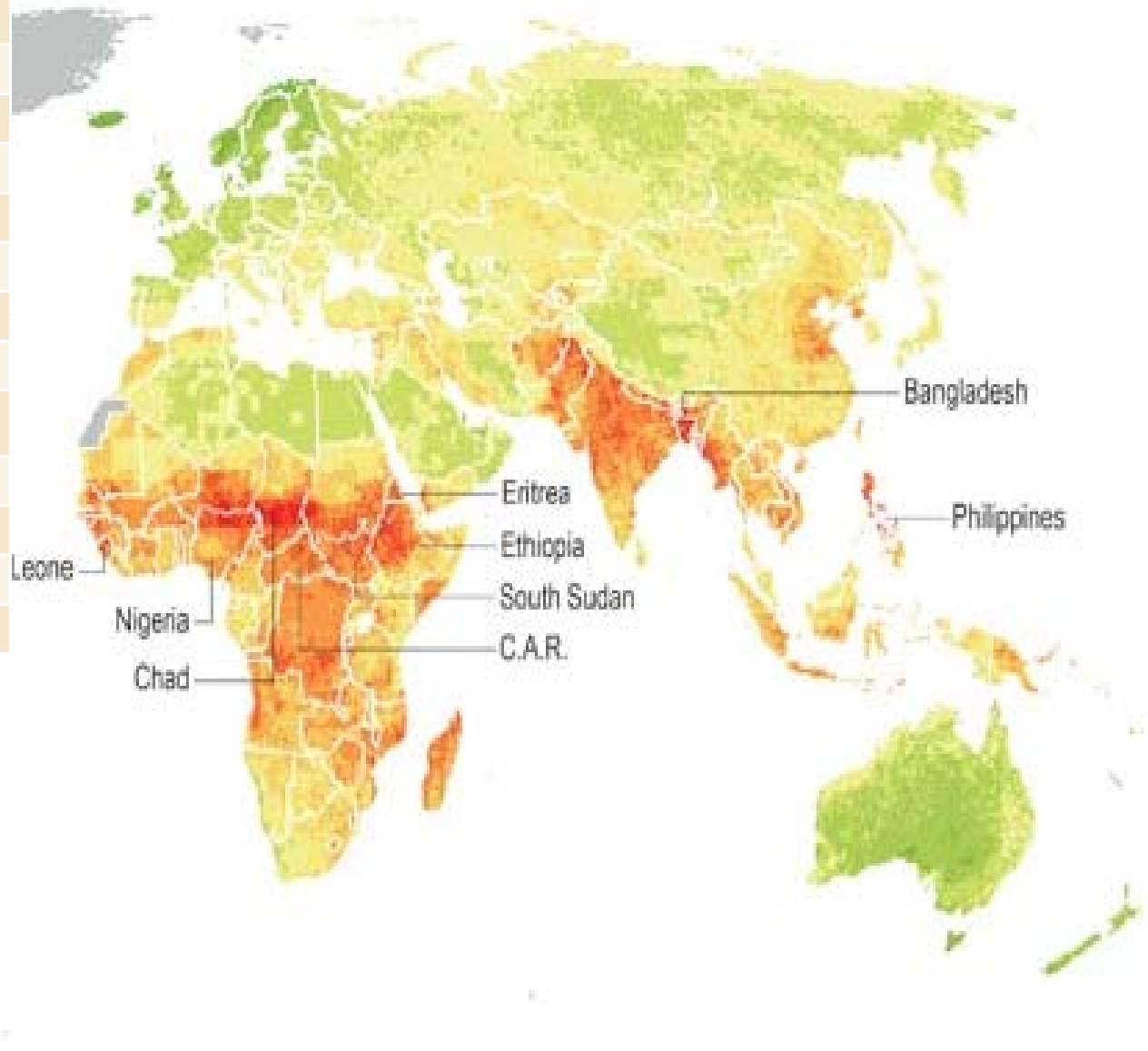
- Understand the effects of climate change
 - what are the areas that are going to be affected, in what way and how badly (vulnerability)

Where?

Climate Vulnerability Risk 2015



Rank	Country	Category
1	Bangladesh	Extreme
2	Sierra Leone	Extreme
3	South Sudan	Extreme
3	Nigeria	Extreme
5	Chad	Extreme
6	Haiti	Extreme
7	Ethiopia	Extreme
8	Philippines	Extreme
9	Central African Republic	Extreme
9	Eritrea	Extreme
13	India	Extreme
19	Myanmar	Extreme
24	Pakistan	Extreme



Legend

Red	Extreme Risk
Orange	High Risk
Yellow	Medium Risk
Green	Low Risk
Grey	No data

In what way?

Extreme weather events: 2000-2010



Major weather events cited in the World Meteorological Organisation study

US 2011

A series of storms moved across the south-eastern US spawning a record number of tornadoes and killing hundreds of people, including nearly 100 in Joplin, Missouri

CANADA 2005

The warmest summer on record in Canada

UK 2000

Widespread flooding in October and November during the wettest autumn in England and Wales since records began in 1766

EUROPE 2003

Record heatwave in France and other parts of Europe. Some 35,000 people are estimated to have died from heat-related causes

CHINA 2010

Torrential rain in China causes landslides. Some 1,500 people killed in one mudslide in north-west China

US 2005

Most active hurricane season on record. Hurricane Katrina hits New Orleans causing extensive flooding and killing more than 1,300 people

BRAZIL 2005

Worst drought in 60 years in Brazil caused by lowest Amazon flow in 30 years

RUSSIA 2010

Extreme heatwave sees temperatures soaring in Moscow, which was badly affected by surrounding wildfires

KEY

-  Heatwaves
-  Severe drought
-  Extreme flooding
-  Hurricanes
-  Tornadoes

ARGENTINA 2009

An exceptional heatwave in northern and central Argentina sees record temperatures of 40C over large areas

HORN OF AFRICA 2006

Long-term drought followed by torrential downpours produce worst flooding for 50 years

PAKISTAN 2010

Worst floods in Pakistan's history affecting some 20 million people. Many hundreds die

AUSTRALIA 2010

Worst floods in more than 50 years affect north-eastern Australia, causing devastation across area the size of France and Germany combined

In what way?

Ex: Vulnerability in South Asia



	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
Sea Level Rise	No	Yes	No	Yes	Yes	No	Yes	Yes
Glacier Retreat	Yes	Yes	Yes	Yes	No	Yes	Yes	No
Increase in intensity of Floods	Not so far	Yes	Yes	Yes	Yes	Yes	Yes	Not so far
Increase in Intensity of Droughts	Yes	In some parts	No	Yes	No	No	Yes	No
Temperature Rise	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

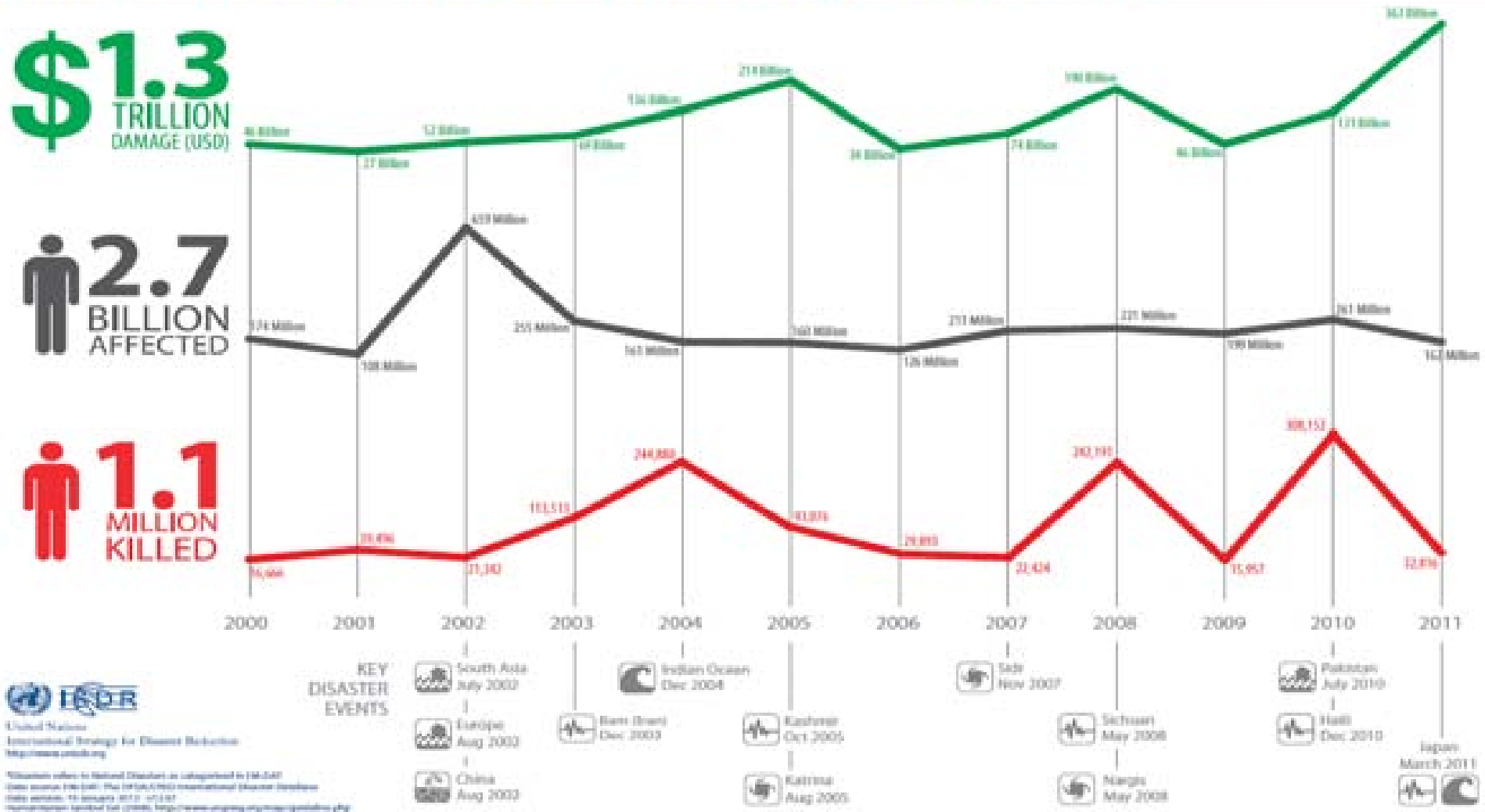
Source: IPCC AR4

How badly?

DISASTER LOSSES AND IMPACTS



The Economic and Human Impact of Disasters* in the last 12 years





What is being done/what needs to be done
to address these vulnerabilities

Adaptation initiative & planning



Region	Highlights of Actions
Africa	National governments are initiating governance systems for adaptation. Disaster risk management, adjustments in technologies and infrastructure, ecosystem-based approaches, basic public health measures, and livelihood diversification are reducing vulnerability , although efforts to date tend to be isolated.
Europe	Adaptation policy has been developed across all levels of government , with some adaptation planning integrated into coastal and water management, into environmental protection and land planning, and into disaster risk management.
Asia	Adaptation is being facilitated in some areas through mainstreaming climate adaptation action into subnational development planning , early warning systems, integrated water resources management, agroforestry, and coastal reforestation of mangroves
Australasia	Planning for sea level rise, and in southern Australia for reduced water availability , is becoming adopted widely. Planning for sea level rise has evolved, although its implementation remains piecemeal.

Adaptation initiative & planning



Region	Highlights of Actions
North America	Governments are engaging in incremental adaptation assessment and planning, particularly at the municipal level . Some proactive adaptation is occurring to protect longer-term investments in energy and public infrastructure.
Central and South America	Ecosystem-based adaptation including protected areas, conservation agreements, and community management of natural areas is occurring . Resilient crop varieties, climate forecasts, and integrated water resources management are being adopted within the agricultural sector in some areas.
Arctic	Some communities have begun to deploy adaptive co-management strategies and communication infrastructure, combining traditional and scientific knowledge.
Small islands	Have diverse physical and human attributes; community-based adaptation has been shown to generate larger benefits when delivered in conjunction with other development activities.
Ocean	International cooperation and marine spatial planning are starting to facilitate adaptation to climate change, with constraints from challenges of spatial scale and governance issues.

Comparison of estimates of adaptation funding needs in developing countries by 2030 (\$billion)



Sector	Study		
	UNFCCC (2007)	Parry et al. (2009)	World Bank (2010a)
Agriculture, forestry, fisheries	\$7	\$7	\$6
Water resources	\$9	Much higher than other two studies	\$11
Human health	\$5	At least \$10	\$3
Coastal zones	\$5	\$10	\$29
Infrastructure	\$22–41	\$65–154	\$29
Extreme events	\$2	\$2	\$7
Fisheries	\$2	\$2	\$2
Ecosystems	\$2	\$33–40a	\$2
Total	\$54–73	> \$129–225	\$60–90b

a. Parry et al. (2009) reported a global estimate of \$65–80 billion. We assume that half of this amount is in developing countries.

b. Range is from the World Bank (2010a) report. Estimates by sector are based on reported numbers for the 2020s and 2030s.

Source: Smith et al., 2011.

Adaptation Constraints



Adaptation constraints comprise of factors which restricts/make it harder to plan and implement adaptation actions:

- ***Physical constraints***
- ***Biological constraints***
- ***Economic constraints***
- ***Financial constraints***
- ***Human Resource constraints***
- ***Social and cultural constraints***
- ***Governance and Institutional constraints***

Adaptation Sectoral synthesis: Opportunities, Constraints and Limits



Sectors			
Sectors (chapter)	Opportunities	Constraints	Limits
Freshwater (3)			
Terrestrial (4)			
Coastal (5)			
Ocean systems (6)			
Food systems (7)			
Urban areas (8)			
Rural areas (9)			
Human health (11)			
Human security (12)			

Adaptation Regional synthesis: Opportunities, Constraints and Limits



Regions			
Regions (chapter)	Opportunities	Constraints	Limits
Africa (22)			
Europe (23)			
Asia (24)			
Australasia (25)			
North America (26)			
Central & South America (27)			
Polar regions (28)			
Small islands (29)			
Open oceans (30)			

Icon legend														
Awareness	Capacity	Tools	Policy	Learning	Innovation	Economic	Human capacity	Social/cultural	Governance	Financial	Information	Physical	Biological	Biophysical

Where do we go from here



- Lima
- Paris

Adaptation in climate negotiations



- **Adaptation fund situation – US\$99 disbursed 31/03/14** (149 countries that are eligible to access it)
- **Criteria for prioritisation and allocation of funds**
- **Future of Adaptation Fund-** especially with uncertain future of Carbon markets and yet-to-be operationalised Green Climate Fund
- **Limits to adaptation** – losses will need to be compensated through effective L&D mechanism