



IPCC and Adaptation

Is the IPCC no longer fit for purpose?

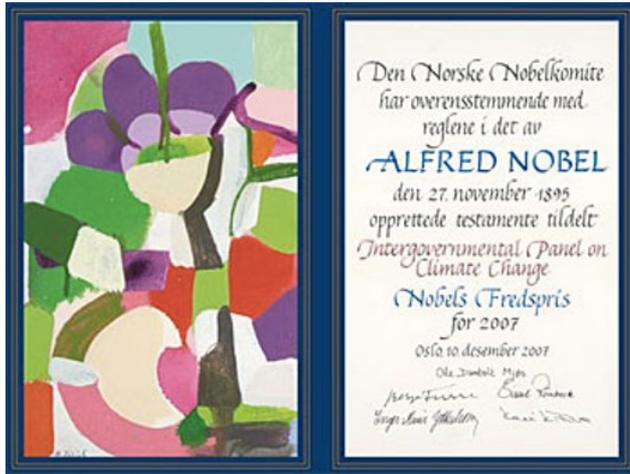
Ian Noble

Monash Sustainability Institute

Currently Green Climate Fund, UNEP PROVIA, Adaptation Gap Initiative, Global Adaptation Index, **Retired?**

Ex IPCC (AR2, AR3, AR5), World Bank, IGBP, Researcher Australian National University (25 years)

IPCC's purpose and accomplishments

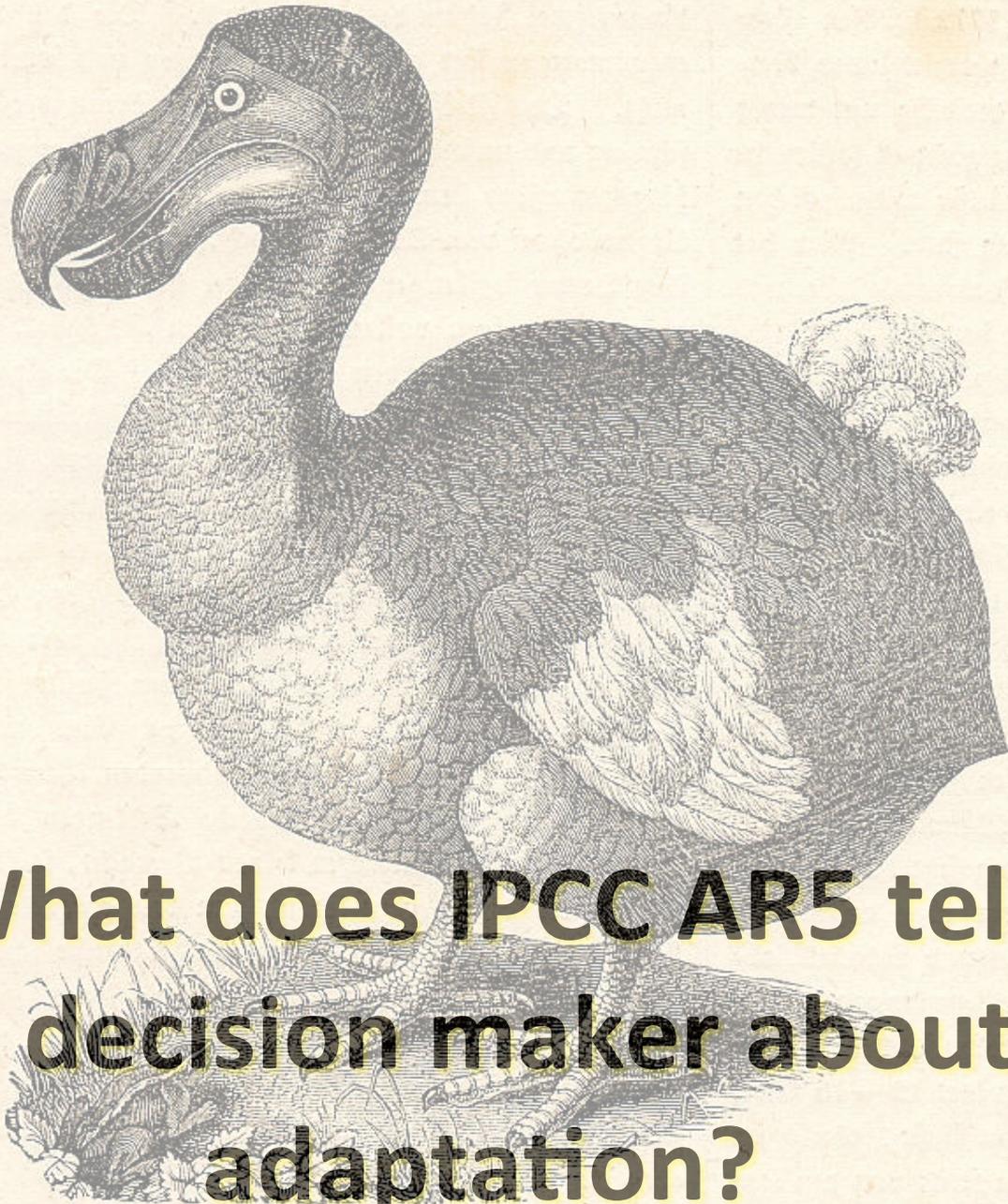


The IPCC was created in 1988 ... to prepare, based on available scientific information, and assessments on all aspects of climate change and its impacts, with a view to formulating realistic response strategies.

“Policy relevant, but not prescriptive”

Actual Text

- “IPCC reports should be neutral with respect to policy, although they may need to deal objectively with scientific, technical and socio-economic factors relevant to the application of particular policies.”



**What does IPCC AR5 tell
a decision maker about
adaptation?**

Fig. 1795. — Dronce.

From the SPM AR5 WG II

“Adaptation Experience”

- Adaptation is becoming **embedded** in some planning processes, with more limited implementation of responses
- Adaptation experience is accumulating across regions in the public and private sector and within communities (high confidence). Governments at various levels **are starting to develop adaptation plans** and policies and to integrate climate-change considerations into broader development plans.
- Responding to climate-related risks involves decision-making in a changing world, **with continuing uncertainty** about the severity and timing of climate-change impacts and with limits to the effectiveness of adaptation (high confidence).
- Adaptation and mitigation choices in the **near-term** will affect the risks of climate change throughout the 21st century (high confidence).
- **Uncertainties** about future vulnerability, exposure, and responses of interlinked human and natural systems are large (high confidence). This motivates exploration of a wide range of socioeconomic futures in assessments of risks.

Key Risks across Sectors and Regions

- Increasing magnitudes of warming increase the likelihood of severe, pervasive, and irreversible impacts.
- The overall risks of climate change impacts can be reduced by limiting the rate and magnitude of climate change.
- For the major crops (wheat, rice, and maize) in tropical and temperate regions, climate change **without adaptation** is projected to negatively impact production for local temperature increases of 2°C or more above late-20th-century levels, although individual locations may benefit (medium confidence).
- All aspects of food security are potentially affected by climate change, including food access, utilization, and price stability (high confidence).
- Many global risks of climate change are concentrated in **urban areas** (medium confidence). Steps that build resilience and enable sustainable development can accelerate successful climate-change adaptation globally.
- **For most economic sectors, the impacts** of drivers such as changes in population, age structure, income, technology, relative prices, lifestyle, regulation, and governance are **projected to be large relative to the impacts of climate change** (medium evidence, high agreement).
- Global economic impacts from climate change are difficult to estimate.
- Throughout the 21st century, **climate-change impacts are projected to slow down economic growth, make poverty reduction more difficult**, further erode food security, and prolong existing and create new poverty traps, the latter particularly in urban areas and emerging hotspots of hunger (medium confidence).

Principles for Effective Adaptation

- Adaptation is place and **context specific**, with no single approach for reducing risks appropriate across all settings (high confidence).
- Adaptation planning and implementation can be enhanced through complementary **actions across levels**, from individuals to governments (high confidence).
- A first step towards adaptation to future climate change is **reducing vulnerability and exposure to present climate variability** (high confidence). Strategies include actions with co-benefits for other objectives.
- Adaptation planning and implementation at all levels of governance are contingent on **societal values, objectives, and risk perceptions** (high confidence). Recognition of diverse interests, circumstances, social-cultural contexts and expectations can benefit decision making processes.
- Decision support is most effective when it is **sensitive to context** and the diversity of decision types, decision processes, and constituencies (robust evidence, high agreement).
- Existing and emerging **economic instruments** can foster adaptation by providing incentives for anticipating and reducing impacts (medium confidence).
- **Constraints** can interact to impede adaptation planning and implementation (high confidence).
- Poor planning, overemphasizing short-term outcomes, or failing to sufficiently anticipate consequences can result in **maladaptation** (medium evidence, high agreement).
- **Limited evidence indicates a gap** between global adaptation needs and the funds available for adaptation (medium confidence).
- **Significant co-benefits, synergies, and tradeoffs exist between mitigation and adaptation** and among different adaptation responses; interactions occur both within and across regions (very high confidence).

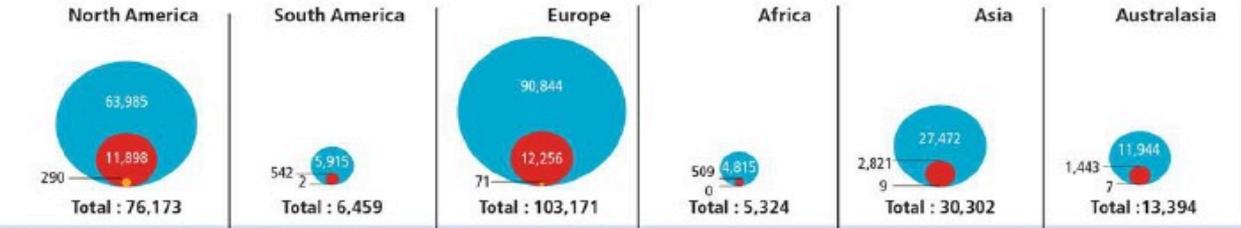
Highlighted statements (i.e. what the decision makers' advisors might read)

Four adaptation chapters and two SPM sections (random order, personal assessment)

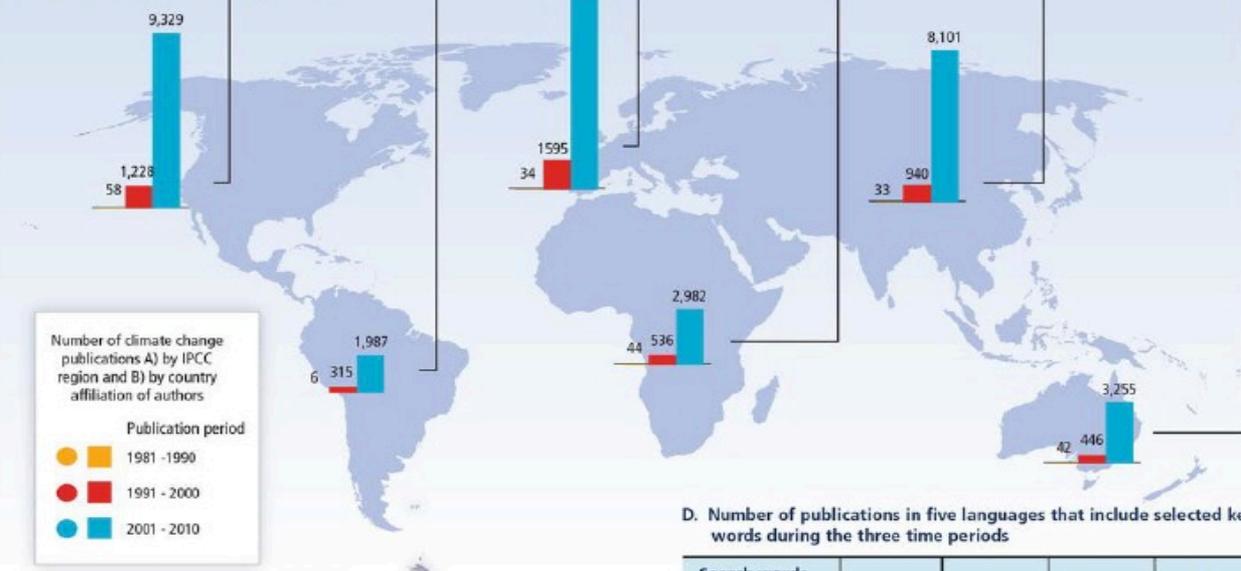
Actionable (iF ... Then ...)	Informative (This is established / possible)	Obvious (Duh!)	Potentially misleading (Are you for real?)
X	Potential of enhancing the role of Local Govt and Private Sector	Increased awareness is often not translated into action	Adaptation is context specific
X	XXXX	XXXXX	Adaptation is just moving from awareness to planning
X	XXXXX X	XXXXX X	XX
X	X XX	XXX X	XX
2.0 (4%)	16.5 (40%)	22.0 (50%)	3.5 (7%)

Literature Assessment

A. Author affiliation



B. Climate change literature by IPCC region

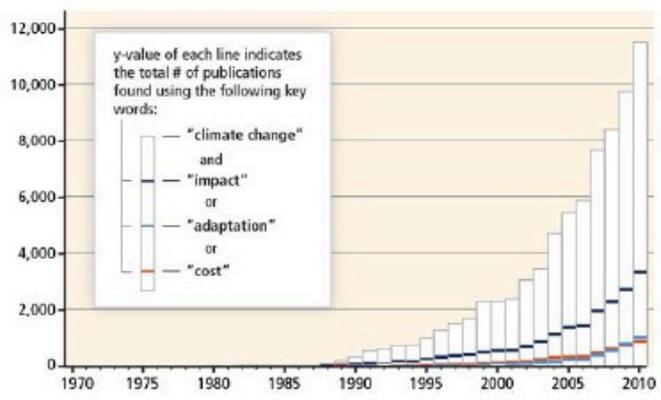


Number of climate change publications A) by IPCC region and B) by country affiliation of authors

Publication period

- 1981 -1990
- 1991 - 2000
- 2001 - 2010

C. Climate change literature in English, total and for selected topics (1970-2010)



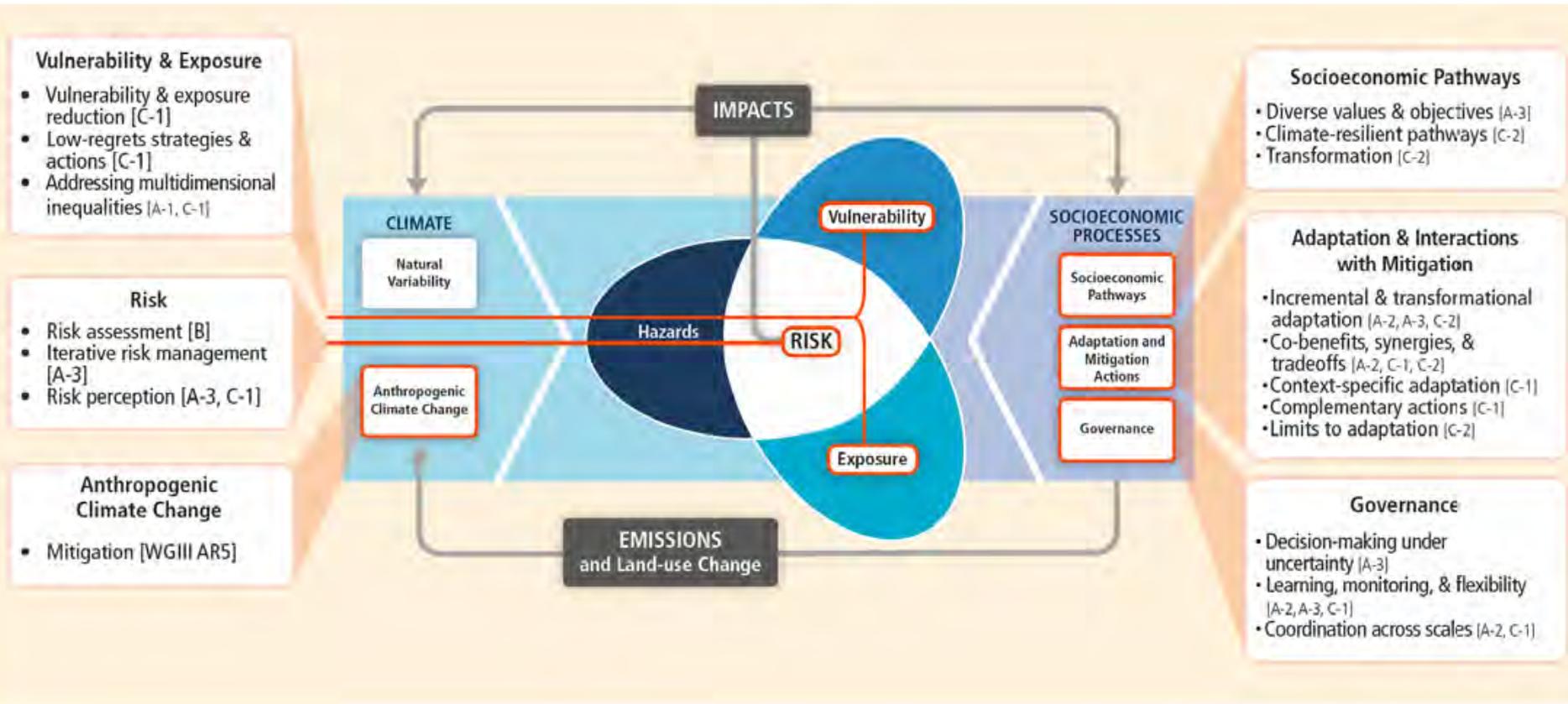
D. Number of publications in five languages that include selected key words during the three time periods

Search words (translated)	Language	1981-1990	1991-2000	2001-2010
"climate change"	English	990	12,686	61,485
	Chinese	1,454	6,353	22,008
	French	1	108	815
	Russian	67	210	1,443
	Spanish	3	82	1,381
"climate change" and "impacts"	English	232	3,001	16,218
	Chinese	133	515	1,780
	French	0	1	95
	Russian	0	72	403
"climate change" and "adaptation"	English	14	373	3,661
	Chinese	6	58	321
	French	0	7	110
	Russian	0	7	44
"climate change" and "cost"	English	24	699	4,099
	Chinese	1	22	162
	French	0	7	36
	Russian	0	1	24
	Spanish	0	2	11

D. Number of publications in five languages that include selected key words during the three time periods

Search words (translated)	Language	1981-1990	1991-2000	2001-2010	Increase 90s to 00s	% English
"climate change"	English	990	12,686	61,485	x 5	70%
	Chinese	1,454	6,353	22,008		
	French	1	108	815		
	Russian	67	210	1,443		
	Spanish	3	82	1,381		
"climate change" and "impacts"	English	232	3,001	16,218	x 5	87%
	Chinese	133	515	1,780		
	French	0	1	95		
	Russian	0	72	403		
	Spanish	0	7	103		
"climate change" and "adaptation"	English	14	373	3,661	x 10	86%
	Chinese	6	58	321		
	French	0	7	110		
	Russian	0	7	44		
	Spanish	0	5	103		
"climate change" and "cost"	English	24	699	4,099	x 6	95%
	Chinese	1	22	162		
	French	0	7	36		
	Russian	0	1	24		
	Spanish	0	2	11		

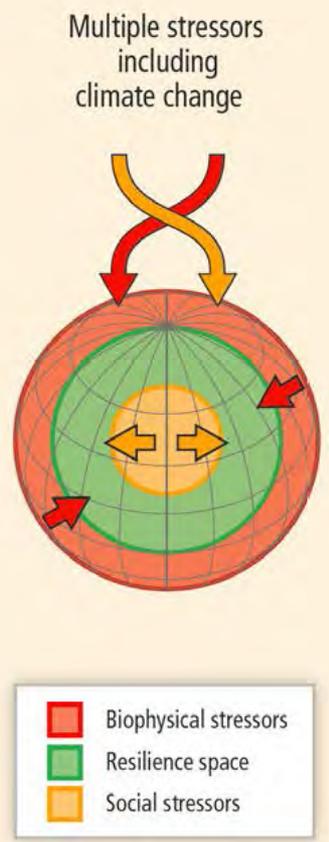
Link to DRM and the SREX Report



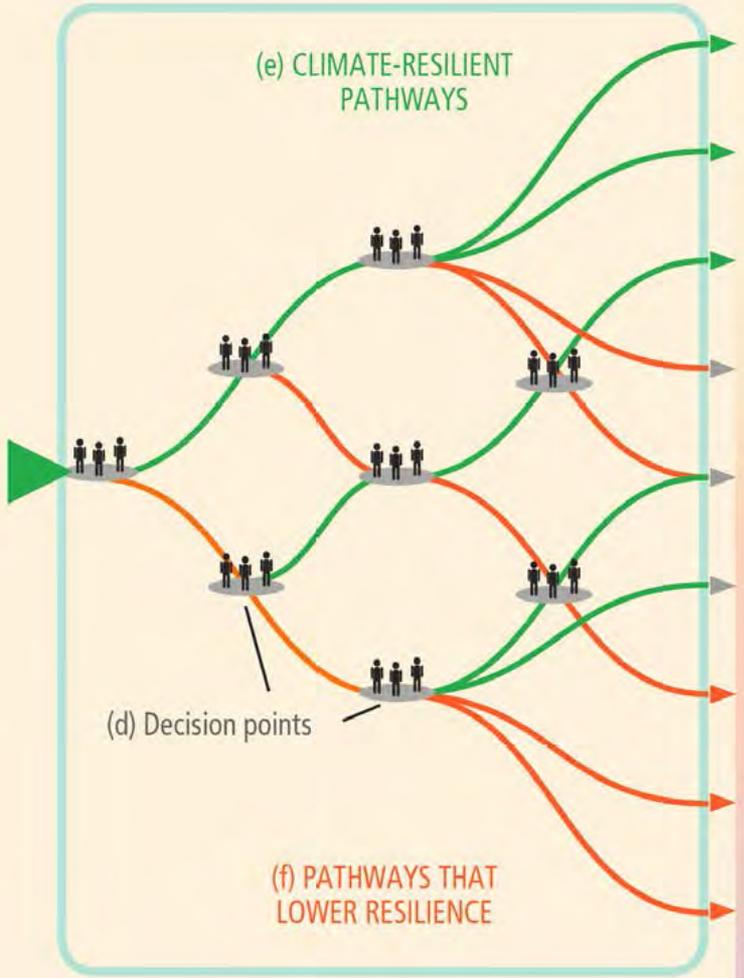
New Imagery

Linking adaptation to multiple stressors and the irreversibility of some decisions

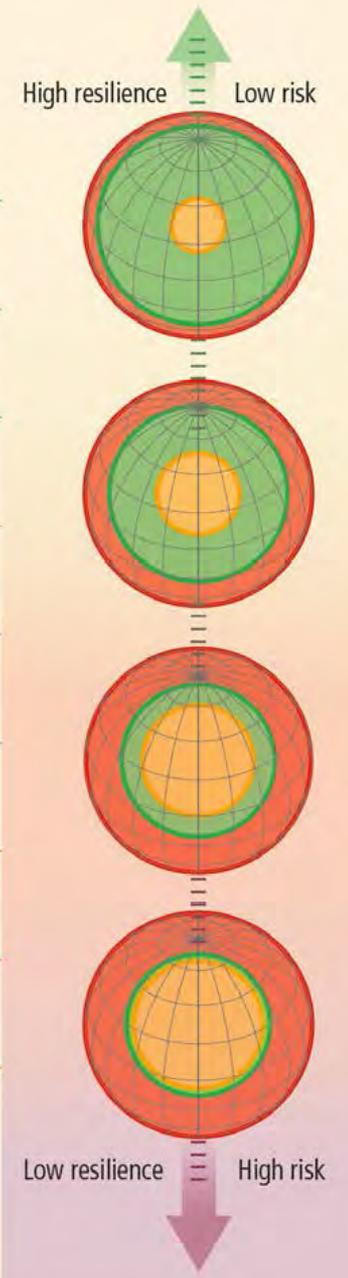
(a) Our world



(b) Opportunity space



(c) Possible futures



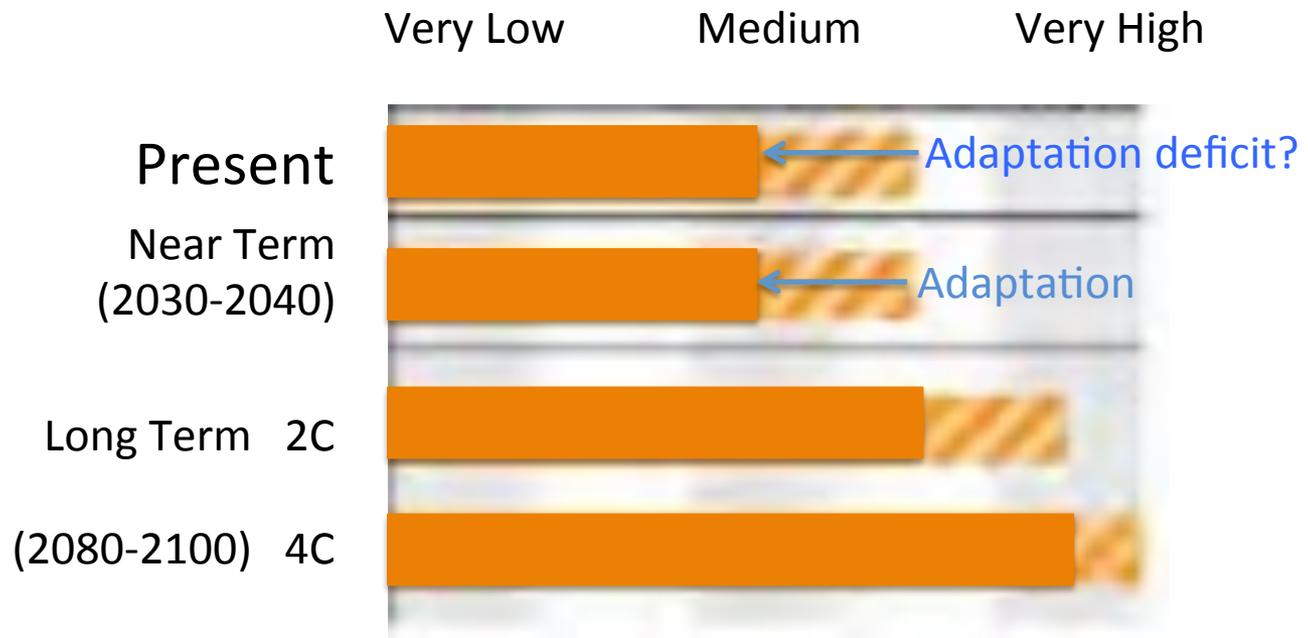
Some “brave” summaries that will be used by decision makers

North America

Key risk	Adaptation issues & prospects	Climatic drivers	Timeframe	Risk & potential for adaptation
<p>Wildfire-induced loss of ecosystem integrity, property loss, human morbidity, and mortality as a result of increased drying trend and temperature trend (<i>high confidence</i>)</p> <p>[26.4, 26.8, Box 26-2]</p>	<ul style="list-style-type: none"> Some ecosystems are more fire-adapted than others. Forest managers and municipal planners are increasingly incorporating fire protection measures (e.g., prescribed burning, introduction of resilient vegetation). Institutional capacity to support ecosystem adaptation is limited. Adaptation of human settlements is constrained by rapid private property development in high-risk areas and by limited household-level adaptive capacity. Agroforestry can be an effective strategy for reduction of slash and burn practices in Mexico. 			
<p>Heat-related human mortality (<i>high confidence</i>)</p> <p>[26.6, 26.8]</p>	<ul style="list-style-type: none"> Residential air conditioning (A/C) can effectively reduce risk. However, availability and usage of A/C is highly variable and is subject to complete loss during power failures. Vulnerable populations include athletes and outdoor workers for whom A/C is not available. Community- and household-scale adaptations have the potential to reduce exposure to heat extremes via family support, early heat warning systems, cooling centers, greening, and high-albedo surfaces. 			
<p>Urban floods in riverine and coastal areas, inducing property and infrastructure damage; supply chain, ecosystem, and social system disruption; public health impacts; and water quality impairment due to sea-level rise, extreme precipitation, and cyclones (<i>high confidence</i>)</p> <p>[26.2-4, 26.8]</p>	<ul style="list-style-type: none"> Implementing management of urban drainage is expensive and disruptive to urban areas. Low-regret strategies with co-benefits include less impervious surfaces leading to more groundwater recharge, green infrastructure, and rooftop gardens. Sea-level rise increases water elevations in coastal outfalls, which impedes drainage. In many cases, older rainfall design standards are being used that need to be updated to reflect current climate conditions. Conservation of wetlands, including mangroves, and land-use planning strategies can reduce the intensity of flood events. 			

Risk and potential for adaptation

Wild-fire induced loss of ecosystem integrity, property loss, human morbidity and mortality as a result of increased drying trend and temperature trend (*high confidence*)



Changing the definition of adaptation

AR4

Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, **which moderates** harm or exploits beneficial opportunities.

SREX

In human systems, the process of adjustment to actual or expected climate and its effects, **in order to moderate** harm or exploit beneficial opportunities.

AR5

The process of adjustment to actual or expected climate and its effects. In human systems, adaptation **seeks to moderate** harm or exploit beneficial opportunities.

The logo features a large, thick, dark red circular ring. A solid blue horizontal bar crosses the center of the ring. The words "MIND THE GAP" are written in white, bold, uppercase letters across the blue bar.

MIND THE GAP

Development community

The aftermath of a natural disaster often gives decision makers an opening to push through corrective and preventive actions. Resilience goes beyond risk migration; it increases not just preparedness but also capacity to respond to a disaster and swiftly recover from it.

DIRECTIONS IN DEVELOPMENT
Environment and Sustainable Development

Building Urban Resilience

Principles, Tools, and Practice

Abhas K. Jha, Todd W. Miner, and Zuzana Stanton-Geddes,
Editors

Communal toilets elevated against flooding in Cambodia





Over ‘academicization’

opinion & comment

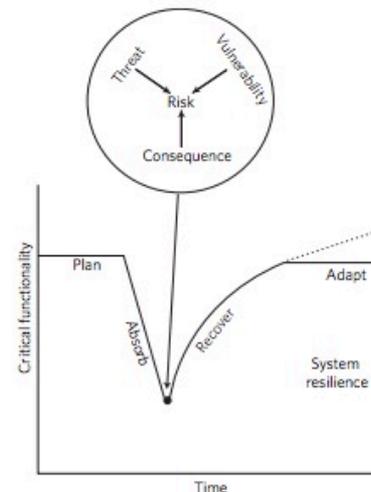
COMMENTARY:

Changing the resilience paradigm

Igor Linkov, Todd Bridges, Felix Creutzig, Jennifer Decker, Cate Fox-Lent, Wolfgang Kröger, James H. Lambert, Anders Levermann, Benoit Montreuil, Jatin Nathwani, Raymond Nyer, Ortwin Renn, Benjamin Scharte, Alexander Scheffler, Miranda Schreurs and Thomas Thiel-Clemen

Resilience management goes beyond risk management to address the complexities of large integrated systems and the uncertainty of future threats, especially those associated with climate change.

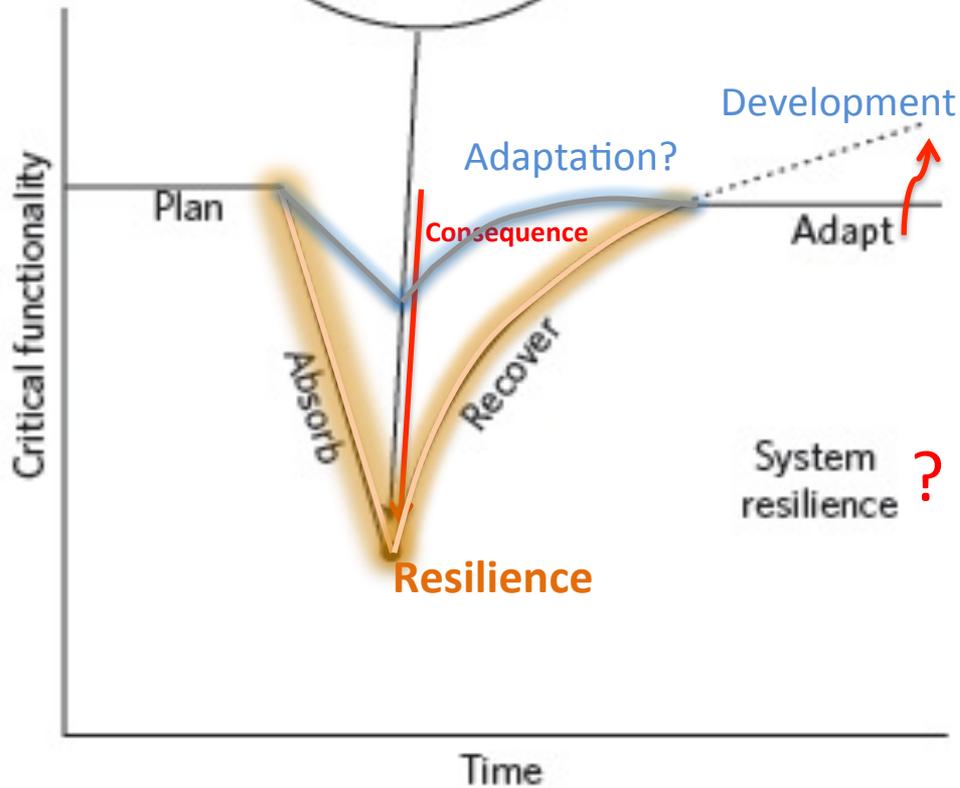
The human body is resilient in its ability to persevere through infections or trauma. Even through severe disease, critical life functions are sustained and the body recovers, often adapting by developing immunity to further attacks of the same type. Our society’s critical infrastructure — cyber, energy, water, transportation and communication — lacks the same degree of resilience, typically losing essential functionality following adverse events. Although the number of climatic extremes may intensify or become more frequent¹, there is currently no scientific method available to precisely predict the long-term evolution and spatial distribution of tropical cyclones, atmospheric blockages and extratropical storm surges; nor are the impacts on society’s infrastructure in any way quantified². In the face of these unknowns, building resilience becomes the optimal course of action for large complex systems.



associated with the vulnerabilities of these systems, combined with the unpredictability of climatic extremes, challenges our ability to understand and manage them. To address these challenges, risk analysis should be used where possible to help prepare for and prevent consequences of foreseeable events, but resilience must be built into systems to help them quickly recover and adapt when adverse events do occur.

A roadmap for enabling the development of such capability should include: (1) specific methods to define and measure resilience; (2) new modelling and simulation techniques for highly complex systems; (3) development of resilience engineering; (4) approaches for communication with stakeholders. Strategies for communicating with policy makers are needed to support the shift to resilience management by legislative, regulatory and other means.

The National Academy of Sciences (NAS) defines resilience as “the ability to manage



Missed opportunities e.g. The PPCR

Pilot Program for Climate Resilience

- A program initiated by the MDBs, to pilot what was to become the Green Climate Fund
- Eventually funded to \$1.3 Billion – 18 countries
- Focus on making climate risks part of development planning
- Greatly exceeds any other singular adaptation financing in total amount and amount per supported country
- Approaching 6 years of experience – many lessons – good and bad – especially for the GCF – comprehensively documented
- *Substantially mentioned in only one chapter of the AR5*

What are policy makers asking?

- Better forecasts!
- Which interventions and processes are most likely to build adaptive capacity / resilience and in which circumstances?
- Do we need transformative changes in our approach? What is transformative change?
- How can we measure the effectiveness of adaptation efforts?



I DON'T BELIEVE IN
GLOBAL WARMING



Tony's challenge

- How do we communicate our results, particularly in the event of significant uncertainty?
- How do we translate information across communities (e.g., from impacts models to integrated assessment models to social cost of carbon models)?
- How do we address catastrophic impacts and extreme events?
- What is the right scale for impacts assessment? And, how do we link across scales?
- How do we develop models that are useful for adaptation decisions?

Uncertainty, uncertainty everywhere, but nary a fact to think

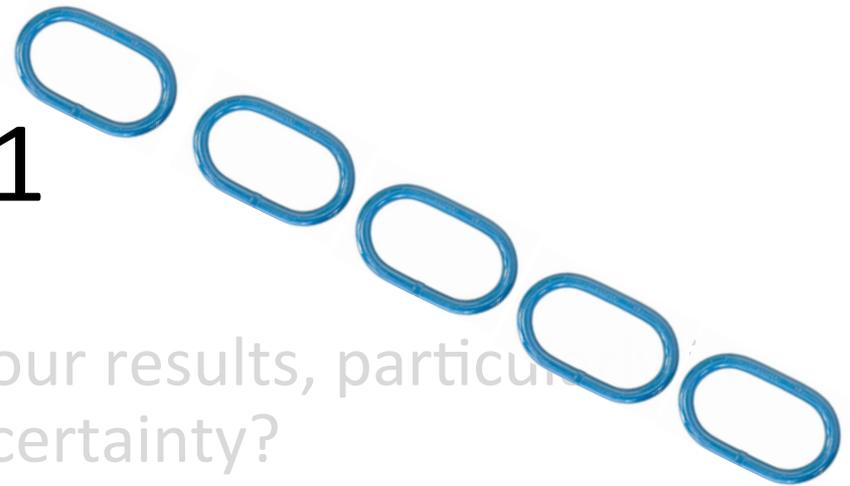
- How do we communicate our results, particularly in the event of significant uncertainty?
- How do we translate information across communities (e.g., from impacts models to integrated assessment models to social cost of carbon estimates)?
- How do we address extreme events?
- What is the right scale for decision-making, and how do we link across scales?
- How do we develop adaptation decisions?

**Start telling
people what
we do know**

What do we know?

- Adaptation is essential - everywhere.
- Adaptation is about taking opportunities that will allow human livelihoods to continue to improve.
- The most appropriate actions (if ever knowable) will be context specific.
- Engaging the full range of stakeholders in an informed and empowered way is the ideal - try to get as close to that ideal as feasible.
- Actions must focus on both the short and long term.
- There are sufficient uncertainties that some form of iterative decision making or adaptive management will be needed (c.f. management of economies).
- Institutions must be structured such that these course corrections are not seen as failures.
- Adaptation is linked to DRM, local and global economies and development goals. It should be an integral part of the broader societal debate and decision making process. We (the science community) should be presenting and positioning it this way and not as a stand alone issue.
- 'Resilience' is a good idea and the debate was useful, but what is resilience? Maybe it's time to erase the term and start thinking more concretely. (C.f. dropping of the term 'autonomous adaptation', and the very meaning of adaptation and maladaptation themselves).

A chain – version 1



- How do we communicate our results, particularly in the event of significant uncertainty?
- How do we translate information across communities (e.g., from impacts models to integrated assessment models to social cost of carbon models)?
- How do we address catastrophic impacts and extreme events?
- What is the right scale for impacts assessment? And, how do we link across scales?
- How do we develop models that are useful for adaptation decisions?

Preparing for the worst while forgetting the grinding down of repeated “minor” setbacks

- How do we communicate our findings about the event of significant uncertainty?
- How do we translate information from models (e.g., from impacts models to integrated assessment models to social cost of carbon models)?
- How do we address catastrophic impacts and extreme events?
- What is the right scale for impacts assessment? And, how do we link across scales?
- How do we develop models that are useful for adaptation decisions?



From



to



to



- How do we communicate our results, particularly in the event of significant uncertainty?
- How do we translate information across communities (e.g., from impacts models to integrated assessment models to social cost of carbon models)?
- How do we address catastrophic impacts and extreme events?
- **What is the right scale for impacts assessment? And, how do we link across scales?**
- How do we develop models that are useful for adaptation decisions?



Over to you

Communicate our results
Significant uncertainty?
Translate information across
Scales models to integrate
Full cost of carbon models



- How do we address catastrophic impacts and extreme events?
- What is the right scale for impacts assessment? And, how do we link across scales?
- How do we develop models that are useful for adaptation decisions?



**Have our realities
diverged?**