



# The Adaptive Challenge of Climate Change

**Karen O'Brien**

Professor


Department of Sociology and Human Geography

University of Oslo, Norway

[karen.obrien@sosgeo.uio.no](mailto:karen.obrien@sosgeo.uio.no)

# Outline

- What do I mean by adaptation?
- Technical problems vs. adaptive challenges
- Responding to adaptive challenges
- Examples from Norway
- Implications for adaptation research, policy and practice



**Adaptation:** Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory, autonomous and planned adaptation (IPCC WGII Glossary, 2007)

**Adaptation:** The process of changing to suit different conditions (Cambridge Online Dictionary)

# Overshoot, adapt and recover

We will probably overshoot our current climate targets, so policies of adaptation and recovery need much more attention, say **Martin Parry, Jason Lowe and Clair Hanson.**

If policy-makers are to reach international agreement on greenhouse-gas emissions at the United Nations Framework Convention on Climate Change conference in Copenhagen in December, they need to be optimistic that their decisions could have swift and overwhelmingly positive effects on climate change. The reality is less certain, but no less urgent.

Even the most restrictive emissions policies proposed to date leave a sizeable chance that significant climate change will occur over the next several decades, probably surpassing the 2°C warming target adopted by the European Union and held by many as a dangerous limit beyond which we should not pass<sup>1</sup>. We must



policy would mean continual 3% year-on-year emissions reductions that could, after several centuries, lead to greenhouse gas concentration of about 350 parts per million (p.p.m.) of carbon dioxide equivalents. A new and useful approach for quantifying long-term emission targets is presented in two new pieces of work published in this issue (pages 1158 and 1163).

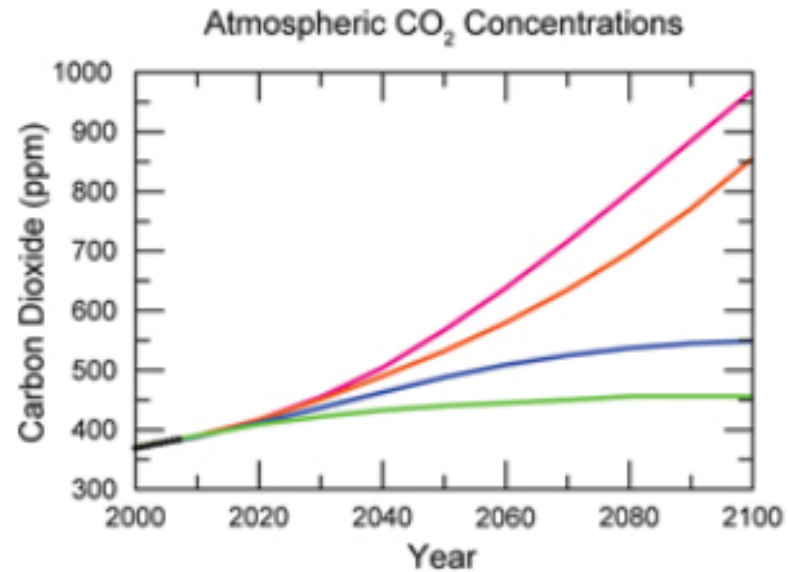
We have simulated the outcomes of this 3%-per-year reduction strategy with a simple Earth system model<sup>2</sup> and have plotted them on a table of projected effects that we constructed, with other Intergovernmental Panel on Climate Change Working Group II authors, for the IPCC 2007

With the same 3%-per-year long-term emissions reductions but a slower start, peak temperatures would rise substantially and the overshoot would extend. For example, delaying mitigative action by ten years and so reversing emissions trends by 2025 would raise peak median temperature by about 2.5°C; delaying by a further ten years (a 2035 downturn) would mean a rise of about 3°C, with much longer recovery.

**"We should be planning to adapt to at least 4°C of warming."**

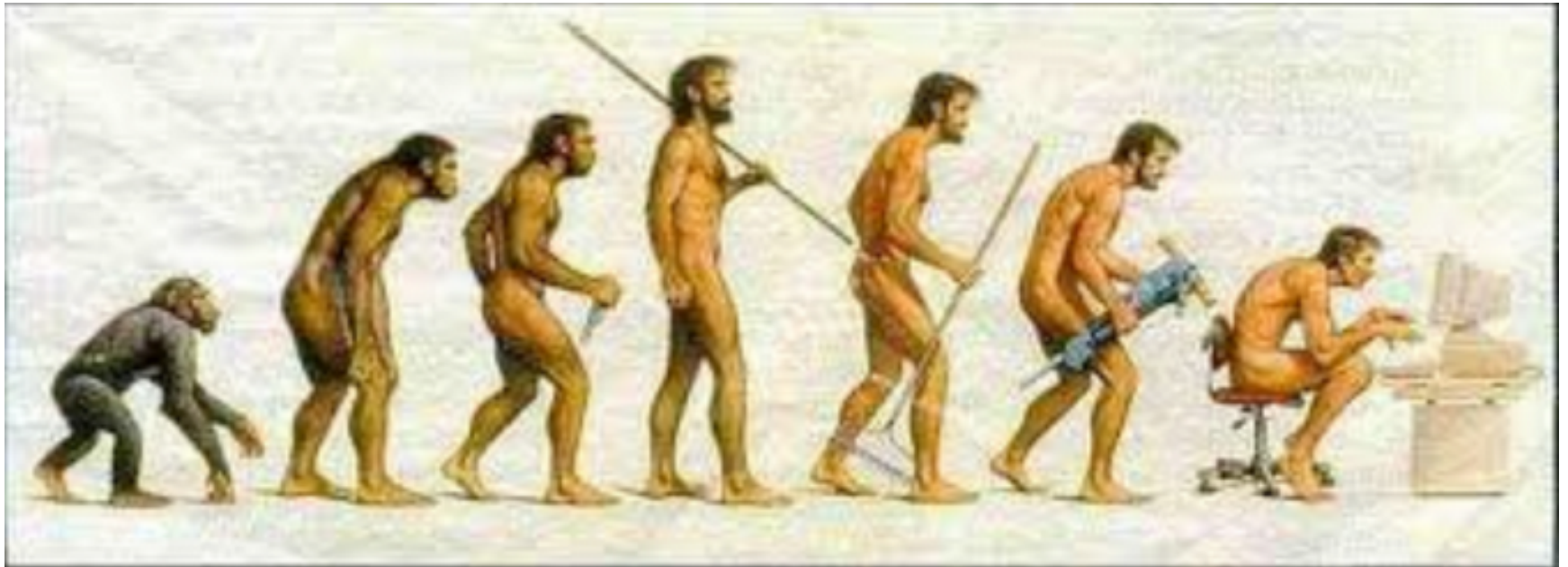
The damage from these levels of warming could be substantial, placing billions more people at risk of water shortage and millions more at risk of coastal flooding. To avoid such damage will require massive investment

# Climate change

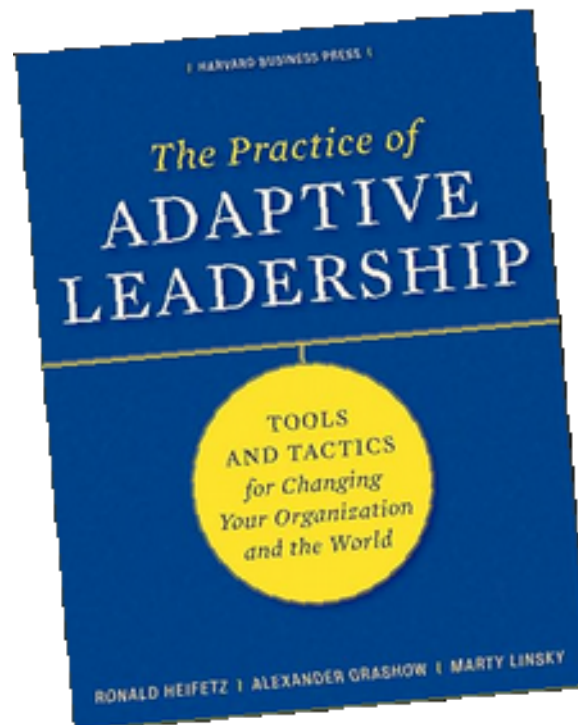


- Even higher emissions scenario (A1FI)
- Higher emissions scenario (A2)
- Lower emissions scenario (B1)
- Stabilization 450 ppm
- Observations

# Adaptation



How are we framing the problem?



# Technical problems

- Problems that can be diagnosed and solved, generally within a short time frame, by applying established knowledge and know-how.
- They are amenable to authoritative expertise and management of routine processes, building on current structures, procedures, and ways of doing things.
- Not limited to technological problems; can also include institutional, managerial, and behavioral changes.

(Heifetz et al. 2009)

# Examples:

- Developing effective early warning systems;
- Building robust sea walls;
- Desalinating water;
- Producing meat in a laboratory;
- Inventing fabrics that cool the body;
- Revising building codes;
- Changing zoning laws;
- Revising insurance policies;
- Etc.

# Adaptive challenges

- Can only be addressed through changes in people's assumptions, beliefs and worldviews and through changes in priorities, habits and loyalties.
- They involve shedding some entrenched ways of thinking and being, tolerating disequilibria and losses, and generating the capacities needed to collectively thrive.
- There is no clear, linear pathway to follow when resolving adaptive challenges.

(Heifetz et al. 2009)



## Mechanical System

- ❖ Static
- ❖ Linear causes and effects
- ❖ Predictable
- ❖ Clearly defined boundaries
- ❖ Complicated
- ❖ Well understood
- ❖ Can be taken apart and analyzed through reductionist method
- ❖ One solution exists and problem can be fixed by experts



**Technical Problem**  
Can be fixed or solved




## Dynamic System

- ❖ Dynamic
- ❖ Non-linear causes and effects
- ❖ Sensitive to initial conditions
- ❖ Blurry boundaries (nested systems)
- ❖ Complex
- ❖ Ill-defined ("messes")
- ❖ Whole complexity embraced by focusing on interactions between parts
- ❖ Multiple ways to address issues by investigating diverse worldviews



**Adaptive Challenge**  
Should be 'outgrown' or 'dissolved'

- 
- Most adaptive challenges also have technical dimensions to them.
  - Heifetz et al. (2009) warn that addressing an adaptive challenge as only a technical problem is destined for failure.
  - Fortunately, we can identify some typical characteristics of adaptive challenges.

# 1) A persistent gap between aspirations and reality

## Global carbon emissions hit record high in 2012

BY NINA CHESTNEY

LONDON Mon Jun 10, 2013 5:05am EDT

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Smog rises from a chimney next a Chinese traditional gate in Beijing February 19, 2013.

CREDIT: REUTERS/KIM KYUNG-HOON

## 2) Responses within the current repertoire are inadequate

### Warsaw Climate Talks Likely to End with Disappointment

By: Karl Ritter  
Published: November 22, 2013



Members of NGOs walk out of United Nations Climate Change Conference COP 19 in Warsaw on November 21, 2013.  
(Janek Skarzynski/AFP/Getty Images)

### 3) Difficult learning is required



# Hyper-complex problems

- *Dynamic complexity*: results when the causes and consequences are distributed over space and type, creating a lag between actions and outcomes.
- *Social complexity*: linked to diverse stakeholders with different values and interests who view climate change and its solution quite differently.
- *Emergent complexity*: associated with non-linear changes that can result in new and surprising properties.
- *Human complexity*: cognition, perception, emotions, identities, and interests influence the way that changes in systems are perceived and addressed.

## 4) New stakeholders across boundaries need to be engaged



5) A longer timeframe is necessary



## 6) Disequilibrium experienced as a sense of crisis is starting to be felt



Charlie Saceda / Reuters



<http://www.flickr.com/photos/oxfam/10911483345/>

7) You are convinced that everyone else needs to change or adapt



# Why do we resist adaptive challenges?

- They create discomfort or disequilibria
- They involve real or potential losses
- They are difficult
- They call for deeper change

# How do we resist adaptive challenges?



Diversion of attention



Displacement of responsibility

# How do we respond to adaptive challenges?

- Learn to recognize the adaptive elements of the problem;
- Explore individual and collective blind spots;
- Recognize and work with different worldviews;
- Identify hidden assumptions and beliefs;
- Connect with the core values of others;
- Focus on the «adaptive work» rather than only the technical aspects of climate change.

# Norway: High Adaptive Capacity?

- One of the wealthiest countries in the world: GDP = 55,000 USD (2012)
- Human development (HDI ranked as #1 in 2012)
- Egalitarian (Gini Index = 25)
- Gender equity: GII = 0.075 (2011)
- Official development assistance (0.95% of GNP)
- High levels of education
- Low levels of corruption,
- Etc. etc.





### Consequences of Climate Change in Norway:

- Higher Temperatures
- More Rain
- Shorter Snow Seasons
- Higher sea levels
- Increased runoff

HEY! THIS WILL BE GREAT FOR NORWAY!

*Michael*

# - Norge tåler klimaendringene

Knut Alfsen er ikke redd for at flom eller tørke skal gjøre Norge ubeboelig. -Vi klarer oss. Det er verre med den tredje verden, sier Cicero-sjefen, som nå skal forske på alternativ energi.

AGNAR KAARBØ  
OLAV OLSEN (foto)

Publisert: 19.nov. 2011 00:09 Oppdatert: 18.okt. 2011 03:29



Den som internasjonale politikere ikke setter i verk tiltak som gjør at klimautslippene reduseres radikalt fra 2020, og den globale oppvarmingen passerer rundt 2 grader ved midten av århundret, kan Norge tjene på det. ©1998 Home Photo News

## Økologisk klimakrise kan bli norsk gullgruve

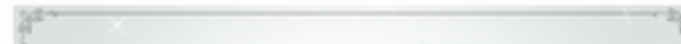
Nordmenn tjener 7 mrd. på å gi blaffen.

Janneke

# Norge slipper lettere unna endret klima

„Ikevel gjøres det minimalt for å begrense skadene av de klimaendringene forskerne vet rammer oss allerede nå. Det mener to av Norges fremste og mest profilerte vitenskapsfolk.

Janneke



# «We can adapt!»

- Winter temperature increases of 2.5 – 4°C by 2100;
- 40% decrease in number of days with suitable skiing conditions by 2050 (compared to 1981-1999 period)



# Traditional values

- Snow cover is important to local and national identity
- **Technical Problem:** transform livelihoods, sustain rural populations, address psychological factors
- **Adaptive Challenge:** maintain cultural heritage and identity (through stories, art, museums)



# Modern values

- Snow cover as a medium for winter sports (an important economic sector)
- **Technical problem:** snow-making technologies, indoor snow domes, artificially cooled ski tracks; new sports
- **Adaptive challenge:** reconstruct or reinvent identity, find new or niche markets



# Post-modern values

- Snow cover as a component of ecosystem integrity; systemic changes; distant impacts of climate change also a concern
- **Technical problem:** adaptive management, building resilience, promoting sustainability.
- **Adaptive challenge:** recognition of mitigation as a critical form of adaptation



# Connecting with people's values



(Finesh.) ..... 6.  
 Det Korn og Rug som Vort Aar er Avlet paa Gaaarden Gøter  
 fik hos i Brug.

1818	73 Tønder og 5 Høller
1819	105 do " "
1820	124 do 4 do
1821	104 Tønder 3 Høller
1822 Solgt 20 Maal	110 af det Øvrige "
1823 Kuns Svagt	88 Tønder og 3 Høller
1824	131 do 8 do
1825	124 Tønder 9 Høller
1826	101 Tønder 5 Høller
1827 Solgt 12 Maal	87 Tønder 9 Høller
1828	120 Tønder ---"
1829	130 Tønder 6 Høller
1830 Kuns Svagt	96 Tønder 3 Høller
1831	83 Tønder 6 Høller
1832	135 Tønder ---"
1833	82 Tønder ---"
1834	125 Tønder 9 Høller
1835	155 Tønder 2 Høller
1836	50 Tønder og noget Svagt
1837	88 Gaaarden 3 Høller

# Implications for adaptation

- Meeting adaptive challenges requires an **adaptive formulation of the problem** (i.e., we need to see exactly how the challenge comes up against the current limits of our own mental complexity), **and an adaptive solution** (i.e., we ourselves need to adapt in some way)

# Implications for adaptation

- We need to adapt from the «inside-out» *first* if we want to successfully adapt the world «out there» to climate change.
- It is difficult to change others «from the inside-out» (this can be oppressive and unethical).
- It is more effective to build your own capacity to do «adaptive work» , i.e., help others deal with the adaptive challenge of climate change.

# Adaptation is not neutral

- "The educated individual is the adapted person, because she or he is better "fit" for the world. Translated into practice, this concept is well suited to the purposes of the oppressors, whose tranquility rests on how well people fit the world the oppressors have created, and how little they question it. The more completely the majority adapt to the purposes which the dominant minority prescribe for them (thereby depriving them of the right to their own purposes), the more easily the minority can continue to prescribe."
- "... the oppressors develop a series of methods precluding any presentation of the world as a problem and showing it rather as a fixed entity, as something given—something to which people, as mere spectators, must adapt."

*Paolo Freire, 1970, Pedagogy of the Oppressed*