# How to handle the issue of uncertainty in Local Climate Change Adaptation Policymaking – summing up the models and approaches developed in Clim-ATIC

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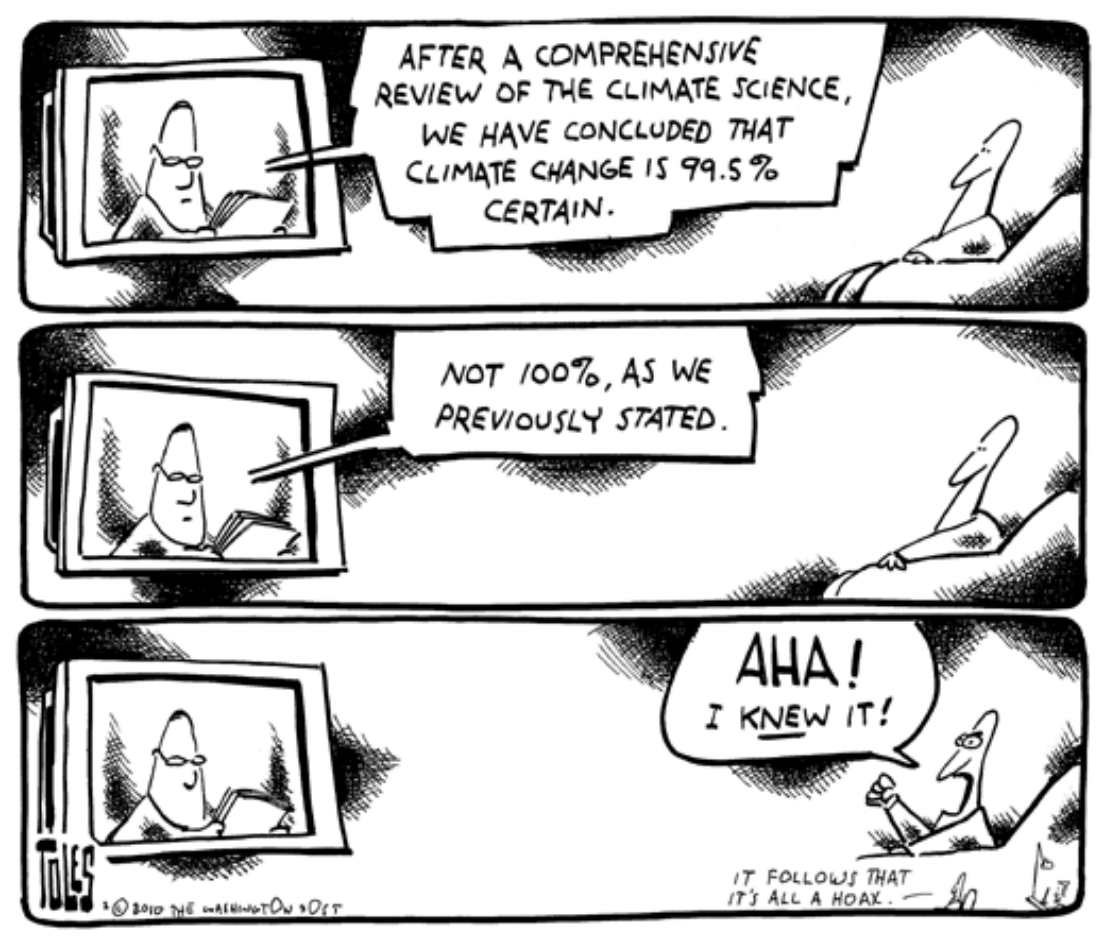
# Outline

1. What is uncertainty in the climate change context?
2. A suggested typology of uncertainty
3. Some practical experiences from trying to cope with uncertainty in local climate change adaptation
4. How important is uncertainty as a hindrance for local action on climate change adaptation?
5. Suggestions on new approaches which might handle the issue of uncertainty in a better way

# Uncertainty and climate change




**….it has to do with the <u>questions</u> we ask and the <u>answers</u> we try to give!**

# The six basic questions in the climate change adaptation debate

Is: Is the climate changing?

Why: Why is the climate changing?

How: How is the climate changing?

Where: Where does specified climate changes take place?

In: In what ways may climate change affect us?

What: What can we do about the effects of climate change?

***The four <u>instrumental</u> questions in climate change adaptation which I will discuss***

# The “uncertainty explosion”

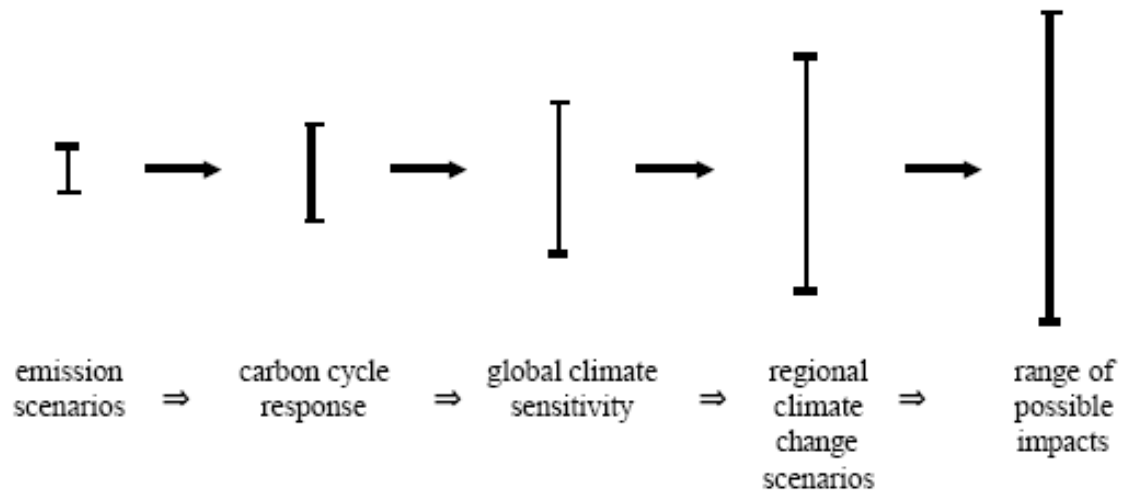



Figure 1. Range of major uncertainties typical in impact assessments showing the “uncertainty explosion” as these ranges are multiplied to encompass a comprehensive range of future consequences, including physical, economic social and political impacts and policy responses (modified after Jones, 2000, and the "cascading pyramid of uncertainties" in Schneider, 1983).

Does this insight lead to “action” or “paralysis”?

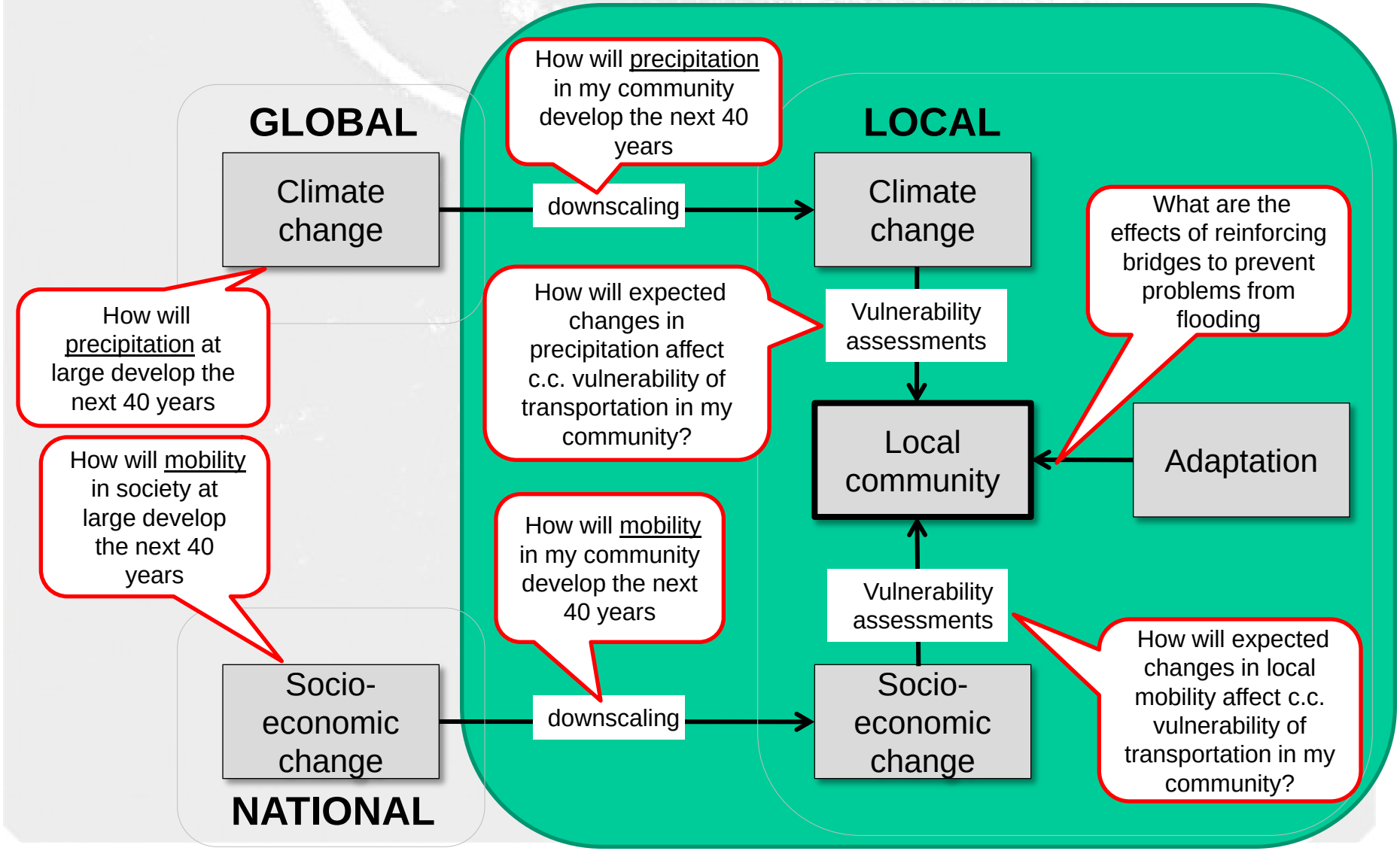
# Trying to “normalize” the issue of uncertainty

- **How to describe the complexity of uncertainty?**
  - Can we describe uncertainty in more ways than just differing between “low” and “high” uncertainty!
- **How to make decisions with uncertainty?**
  - Do uncertainties relating to climate change adaptation policymaking differ substantial from uncertainties relating to other policy areas?

# A typology of uncertainty

- **Nature of uncertainty**
  - Theories: We do not know the basic cause-effect mechanisms
  - Models : Our models are not good enough
  - Data : We do not have sufficient data
  - Variability: Natural variations are difficult to predict
- **Location of uncertainty**
  - In the chain of cause-effect: Climate change, impact on nature and society, effectiveness in adaptation measures
  - In scale: Downscaling from global to local level.
- **Communication of uncertainty**
  - Hot and cold problem: How to balance between scientific accuracy (“cold”) and relevance for decision making (“hot”)
  - Time problem: Short-term costs and long-term benefits are typical of c.c. adaptation, and with current methods of cost/benefit (c/b) analysis c.c. adaptation will often come with a very bad c/b ratio

## Most relevant for local climate change adaptation policymaking



# Some experiences from trying to cope with uncertainty in local climate change adaptation

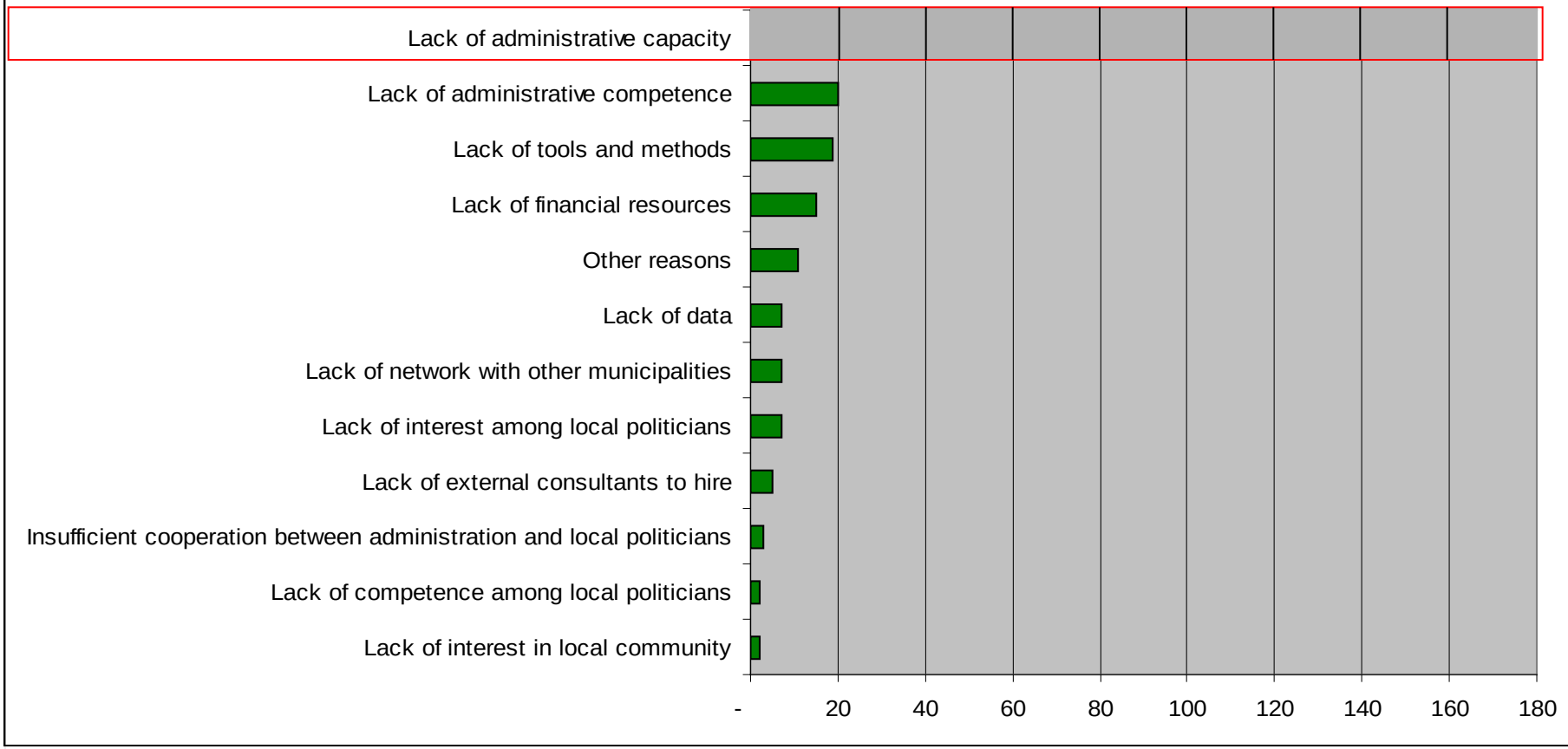
- **Global climate change scenarios**
  - Will we get more “wind”?
    - **Theoretical** uncertainty: need for basic research

- **Downscaling climate change scenarios**
  - Will we get more rain?
    - **Basic** (or **model**?) uncertainty regarding regional distribution of precipitation: an uncertainty we have to live with? (an issue of special importance for Norway)
  - What are the “best” and “worse” case values?
    - **Communication** uncertainty: downscaling often limited to an average between “best” and “worse” case values from different climate models, whereas user groups often need the extreme values as well

# Some experiences from trying to cope with uncertainty in local climate change adaptation

- **Interaction between climate and societal change**
  - Will expected changes in society make us more or less vulnerable to climate change?
    - **Communication** uncertainty: the one-sided approach (that is – looking only at the partial effect of climate change on future society) is often applied, and well known methods of long-term planning is often not applied in the case of climate change adaptation – which could enable us to apply the two-sided approach
  - Will climate change mitigation policies make us more or less vulnerable to climate change?
    - **Communication** uncertainty: climate change mitigation and adaptation policies are often not linked with each other, thus increasing the danger of negative feed-back mechanisms between the two policy areas taking place (that is – mitigation creating higher vulnerability as well as the possibilities that adaptation might create higher GHG emissions)

## Number of informants stating the three most important hindrances in working with environmental policy




258 answers from informants in 97 municipalities taking part in a survey among two major Norwegian network projects (“Livskraftige kommuner” and “Green energikommuner”)

# Suggestions on new approaches which might handle the issue of uncertainty in a better way

- **Connecting in a better way climate change mitigation and adaptation**
- **Differing between four modes of climate vulnerability**
- **Differing between four modes of climate adaptation**
- **Identifying a set of “rules of the thumb” for prioritizing climate adaptation options**

# Connecting in a better way climate change mitigation and adaptation

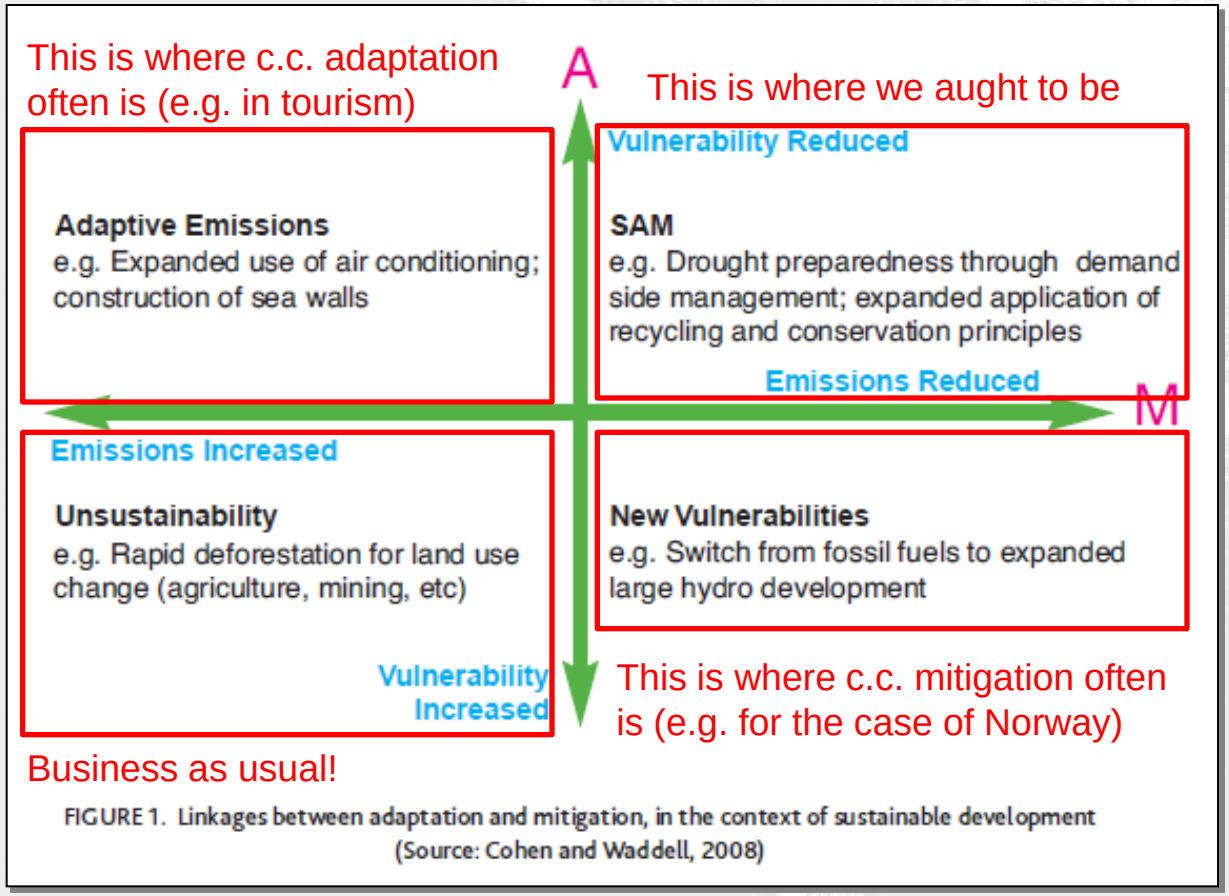
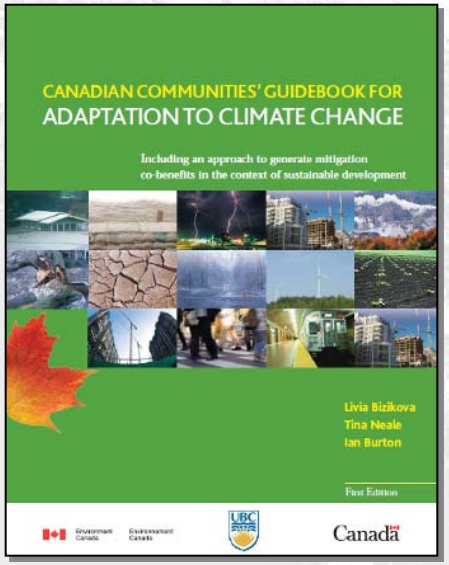
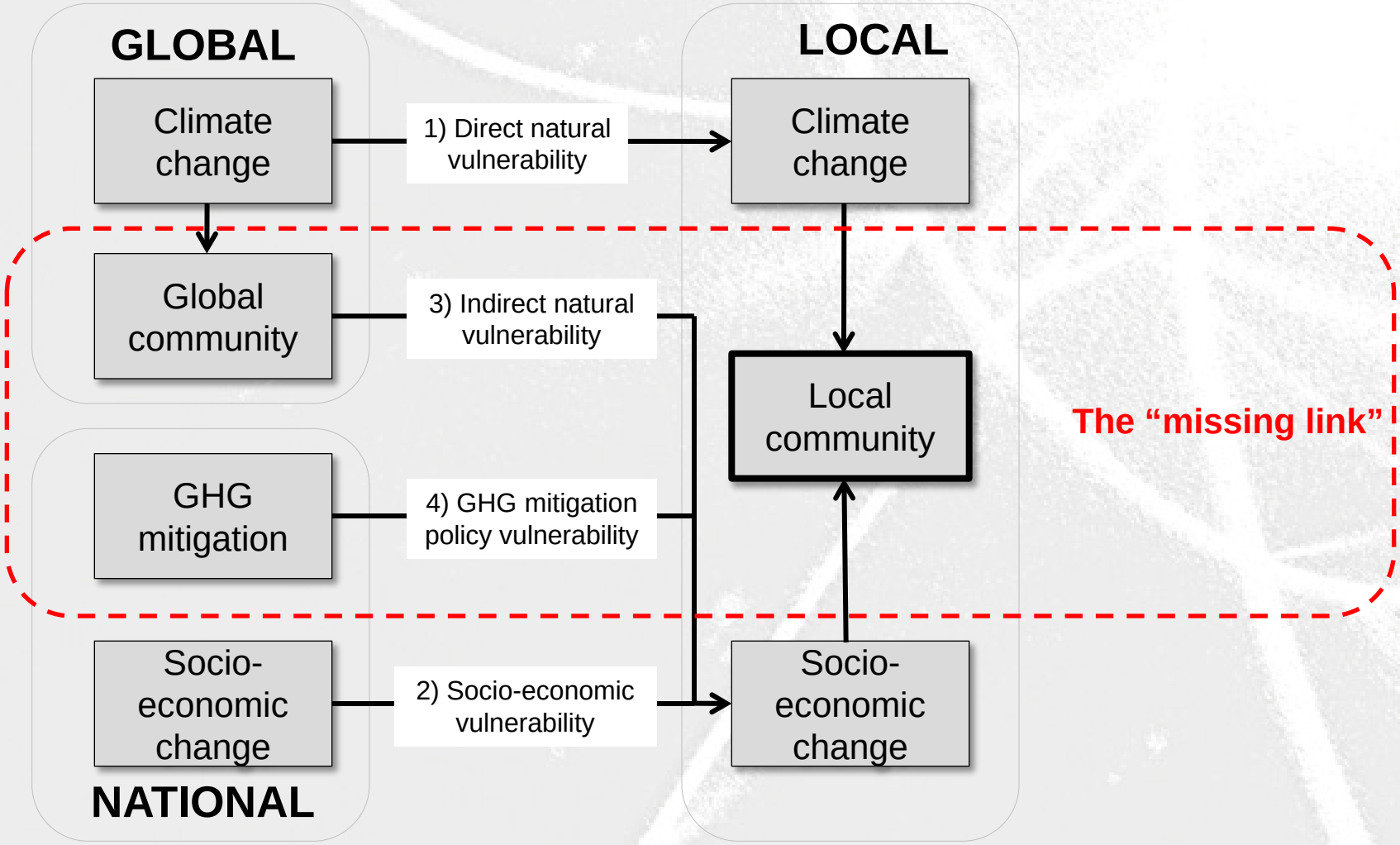



FIGURE 1. Linkages between adaptation and mitigation, in the context of sustainable development (Source: Cohen and Waddell, 2008)




Source: http://www.forestry.ubc.ca/LinkClick.aspx?fileticket=xsexCSatHjo%3d&tabid=2455&mid=5415&language=en-US

# Four modes of climate vulnerability



# Four modes of climate adaptation

1. **Effect oriented adaptation to local climate change**
   - E.g. build flood protection
2. **Cause oriented adaptation to local climate change**
   - E.g. change location of areas for new housing development
3. **Indirect oriented adaptation to climate change taking place elsewhere**
   - E.g. protect farmed land from housing or road development
4. **Climate change mitigation policy adaptation**
   - E.g. secure access to public transportation in tourism development

# Suggested “rules of the thumb” for prioritizing climate adaptation options

1. **Adapt to today's climate**
   - In this case the uncertainties are more or less “known”
2. **Further analyze climate vulnerabilities**
   - Applying all four modes of vulnerability assessments
3. **Secure sufficient institutional capacity**
   - That is; sufficient administrative capacity and sufficient competence within both administrative personnel and elected representatives
4. **Prioritize planning before acting**
   - Local conditions could alter this suggested prioritizing!
5. **Prioritize cause-directed before effect-directed strategies and means**
   - Local conditions could alter this suggested prioritizing!

# Thank you for your attention!

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