



enhance  
Partnership for Risk Reduction



# A (physical) science perspective of Loss and Damage decision making

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## Science and L&D decision making



- What are L&D decisions?
- What information is needed ?
- What information is available ?
- What about uncertainties and attribution?



Surminski, Swenja and Lopez, Ana (2015)  
*Concept of loss and damage of climate  
change – a new challenge for climate  
decision-making? a climate science  
perspective.* *Climate and Development*,  
7 (3). pp. 267-277



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## L&D decision making



### Three possible goals:

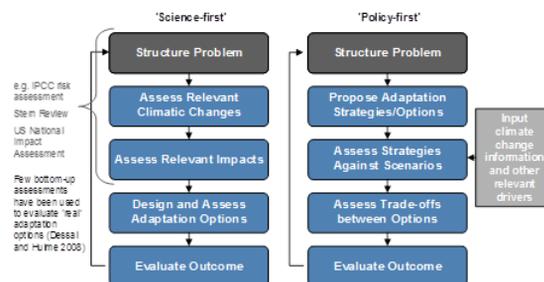
- To **create awareness** about the sensitivity of human and natural systems to climate, and the need to respond with appropriate mitigation, adaptation and DRR policies.
- To **plan risk reduction and risk management**, with the goal to enhance adaptation to reduce vulnerability and build resilience.
- To **inform compensation** arrangements for L&D.

## The purpose of assessing L&D

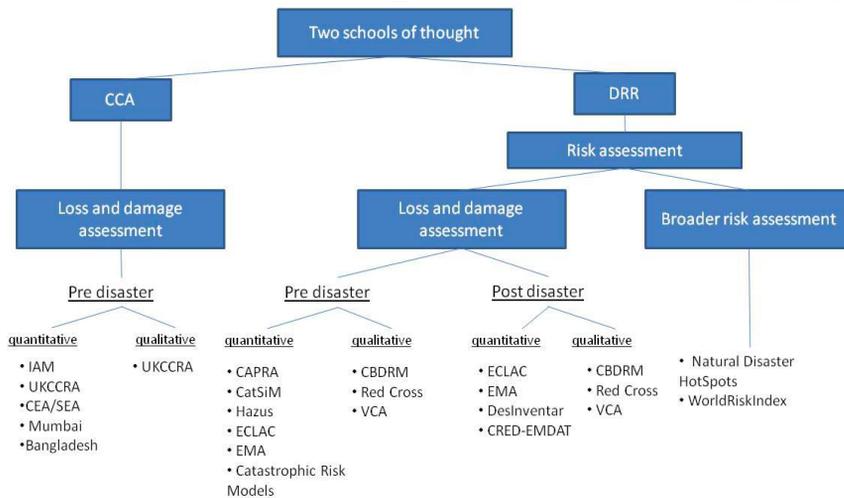


A risk assessment informs decision-making by providing information about the possible consequences of decisions.

➤ What are the L&D objectives and interests?



## Schools of thought



Surminski, Lopez, Birkmann and Welle (2012) for UNFCCC



## Challenges



- Direct and indirect losses & growing interconnectedness of impacts (such as cascading effects) are recognized, but no clear methodology exists
- Non-economic losses: Quantification poses challenges, but can be addressed pragmatically (See: Vivid Economics 2013)
- Slow onset changes require a different perspective
- Linking qualitative and quantitative assessment approaches necessary
- From global to local: different scales of data and assessment are needed
- We need to understand vulnerability and effectiveness of adaptation, as well as limits to adaptation
- Climate signal often weak or unclear

## L&D and uncertainty

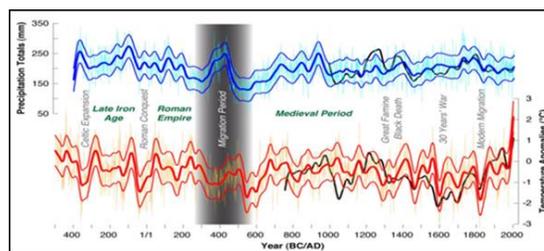


- Any assessment of L&D from climate change needs to incorporate information about the climatic hazard, including current climatic variability and possible future climatic changes; and information about the vulnerability and exposure.
- A significant challenge for L&D is the uncertainty in this information. The climate dimension just adds to the uncertainty derived from the wide range of socio-economic and environmental factors considered, often referred to as the 'cascade of uncertainty' (Schneider, 1983) or the 'uncertainty explosion' (Henderson-Sellers, 1993).

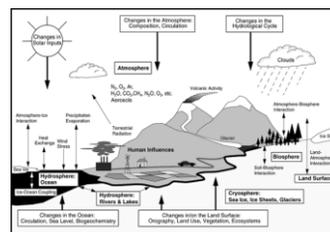
## Attribution of INDIVIDUAL events is hard (impossible?)



- Climate varies continuously at all time scales, therefore there is always a chance that weather extreme event occurs *naturally*.
- Usually there are *many causal factors* underlying an extreme event.



Buntgen et al, Science (2011)



## Attribution of changing meteorological risk?



**Can we instead ask:** What is the change in the probability of occurrence of a weather event due to anthropogenic climate change?

**To answer this question:** need to rely on climate models to simulate a world with and without climate change

But given climate modelling uncertainties: are the resulting probabilities robust estimates of changing risk?

Attribution of weather event does not imply attribution of actual impact. From rainfall to landslides -> cascade of uncertainties.

**This links to miss-conceptions of risk:** attribution of meteorological hazard does not imply attribution of total risk (that includes exposure and vulnerability).



## Loss and Damage Network

*... a network of scientists, policymakers and practitioners informing the Loss and Damage debate*

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Thank you for your attention.

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