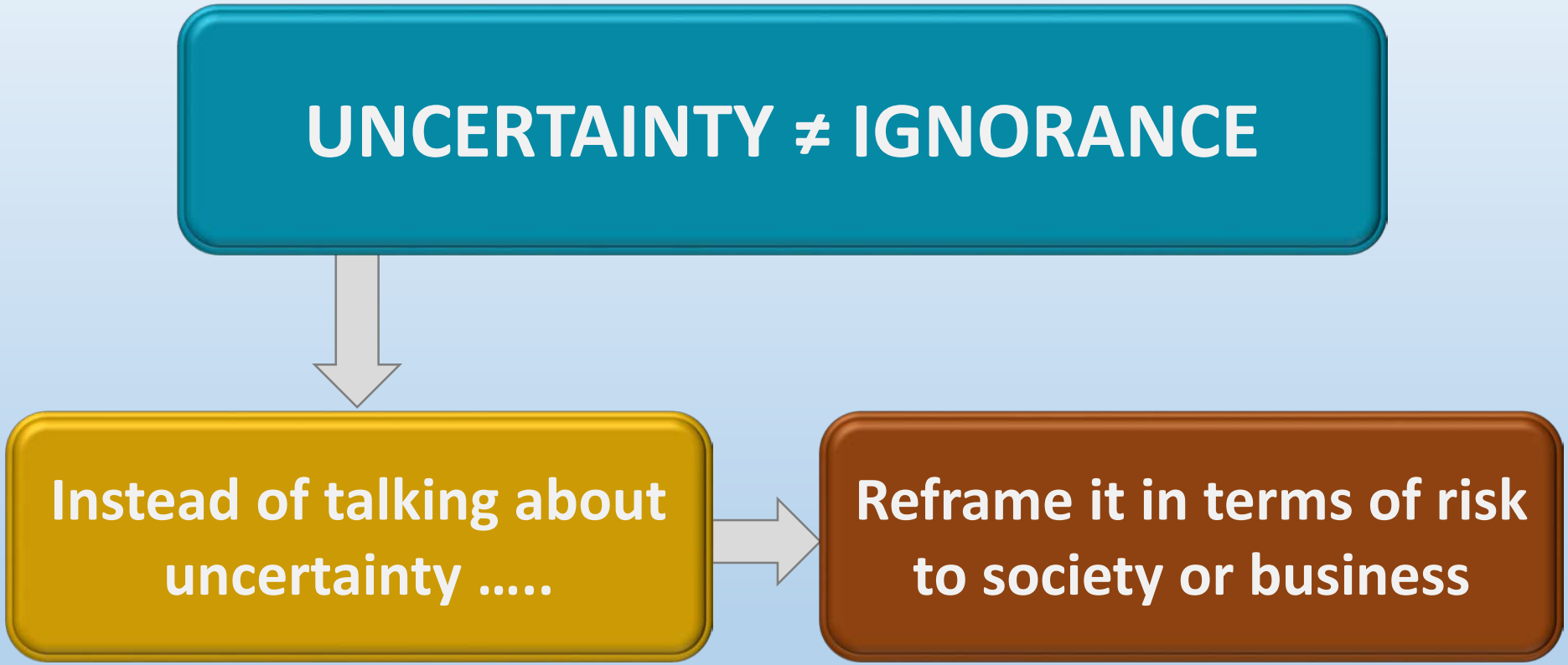
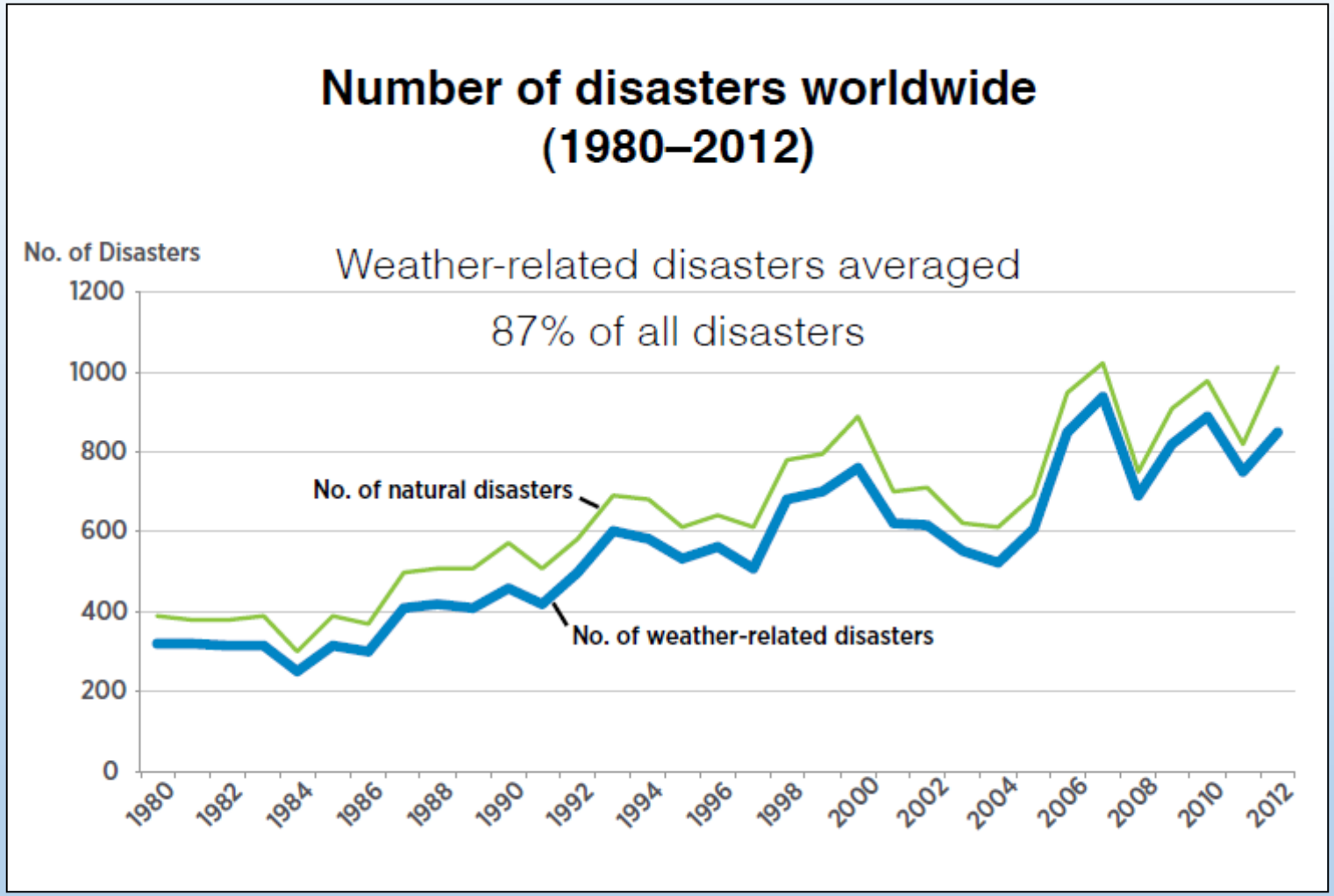
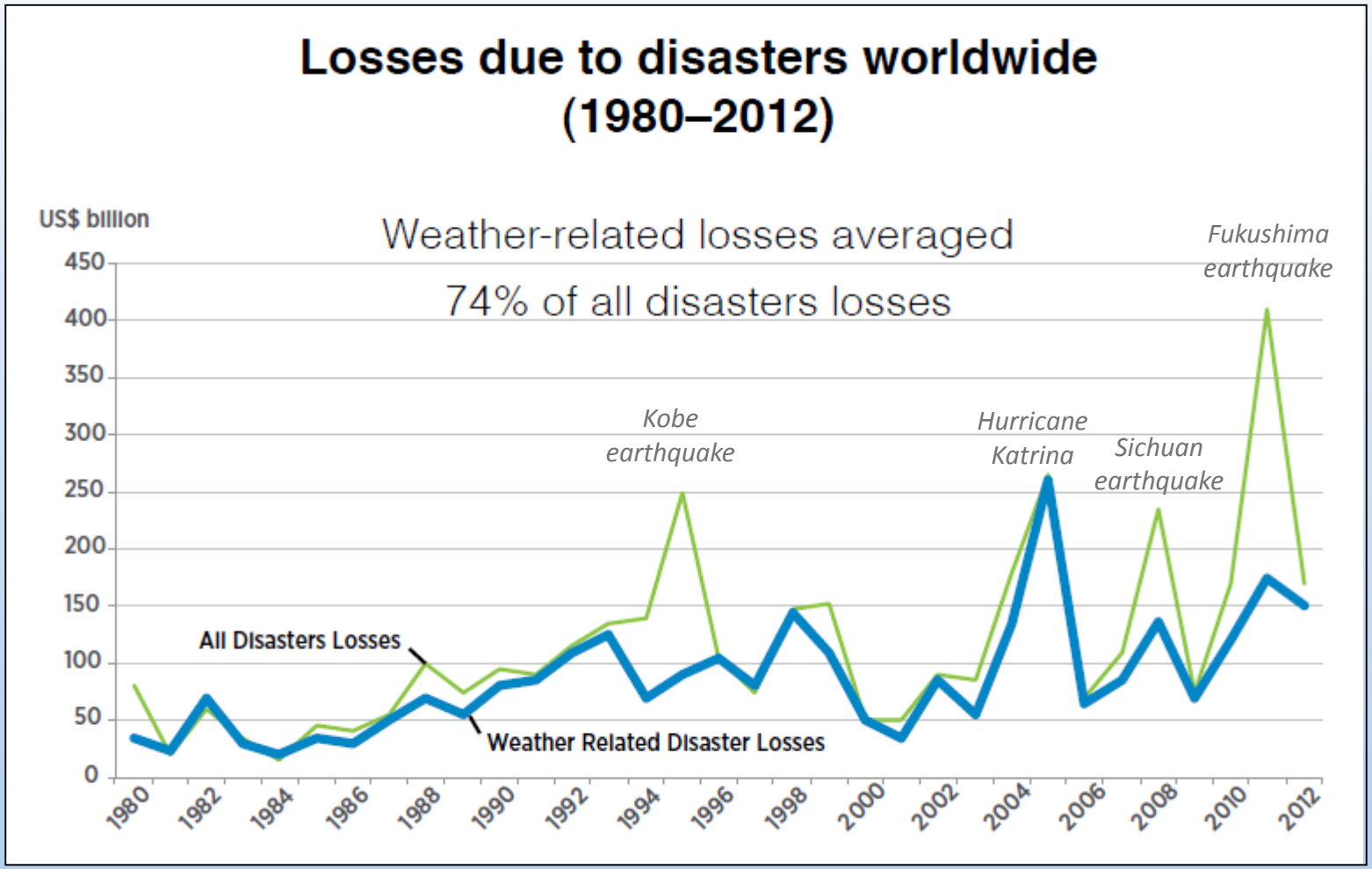
The future isn't anymore what it used to be!

Luis E. Montañez Cartaxo and Simon Catchpole


UNCERTAINTY ≠ IGNORANCE
Instead of talking about uncertainty …..
Reframe it in terms of risk to society or business



Source: Adapted from © 2013 Münchener Rückversicherungs-Gesellschaft, Geo Risks Research, NatCatSERVICE (as of January 2013).



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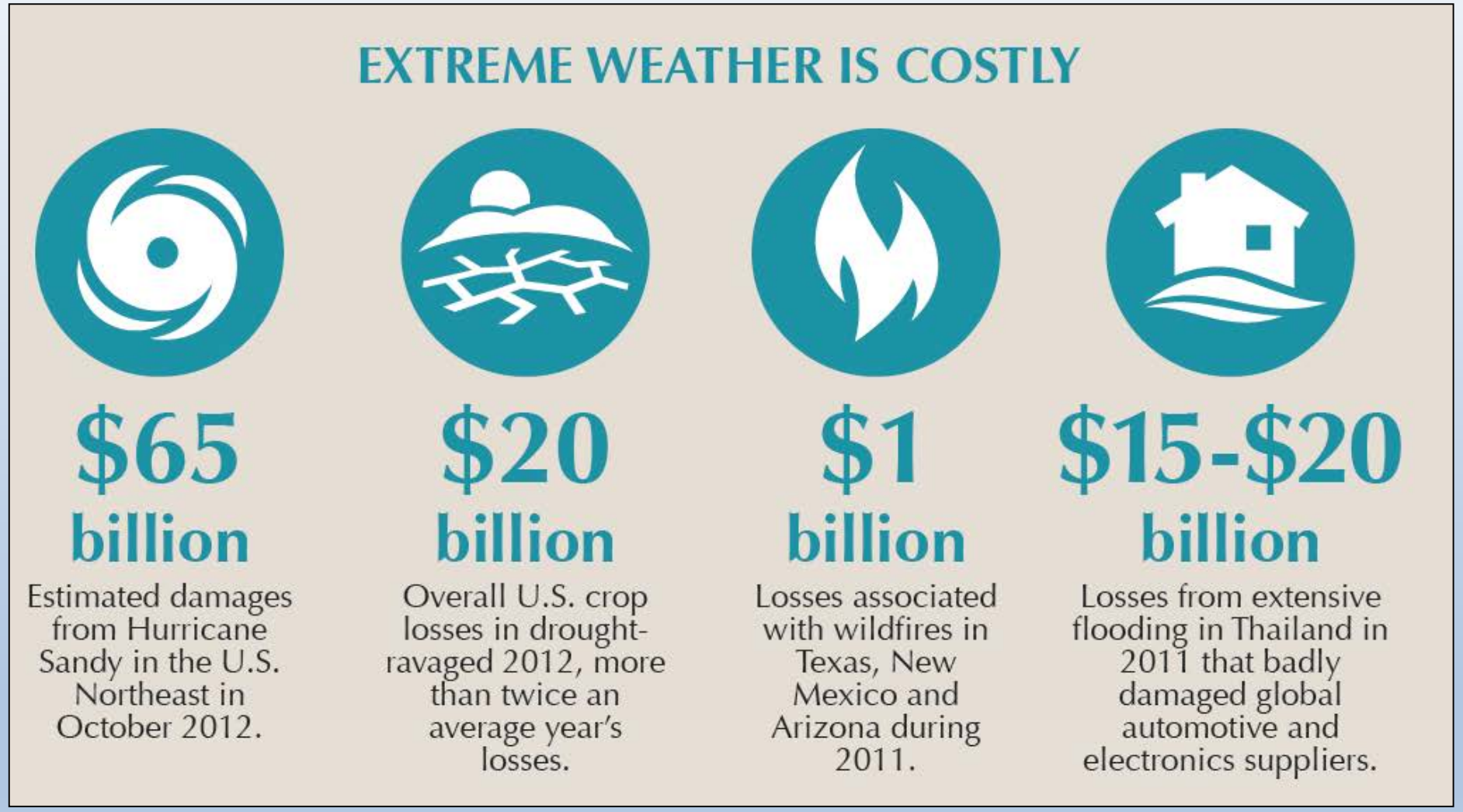


USA

Source: Weathering the Storm: Building Business Resilience to Climate Change, C2ES, 2013

EXTREME WEATHER IS COSTLY

$1.5 billion

In November 2013 hurricane Haiyan affected four countries producing 6,308 fatalities and 1,061 missing.

$3.8 billion

In 2010-2011, a devastating drought in northern Mexico produced severe losses in corn, beans and cattle.

$15 billion

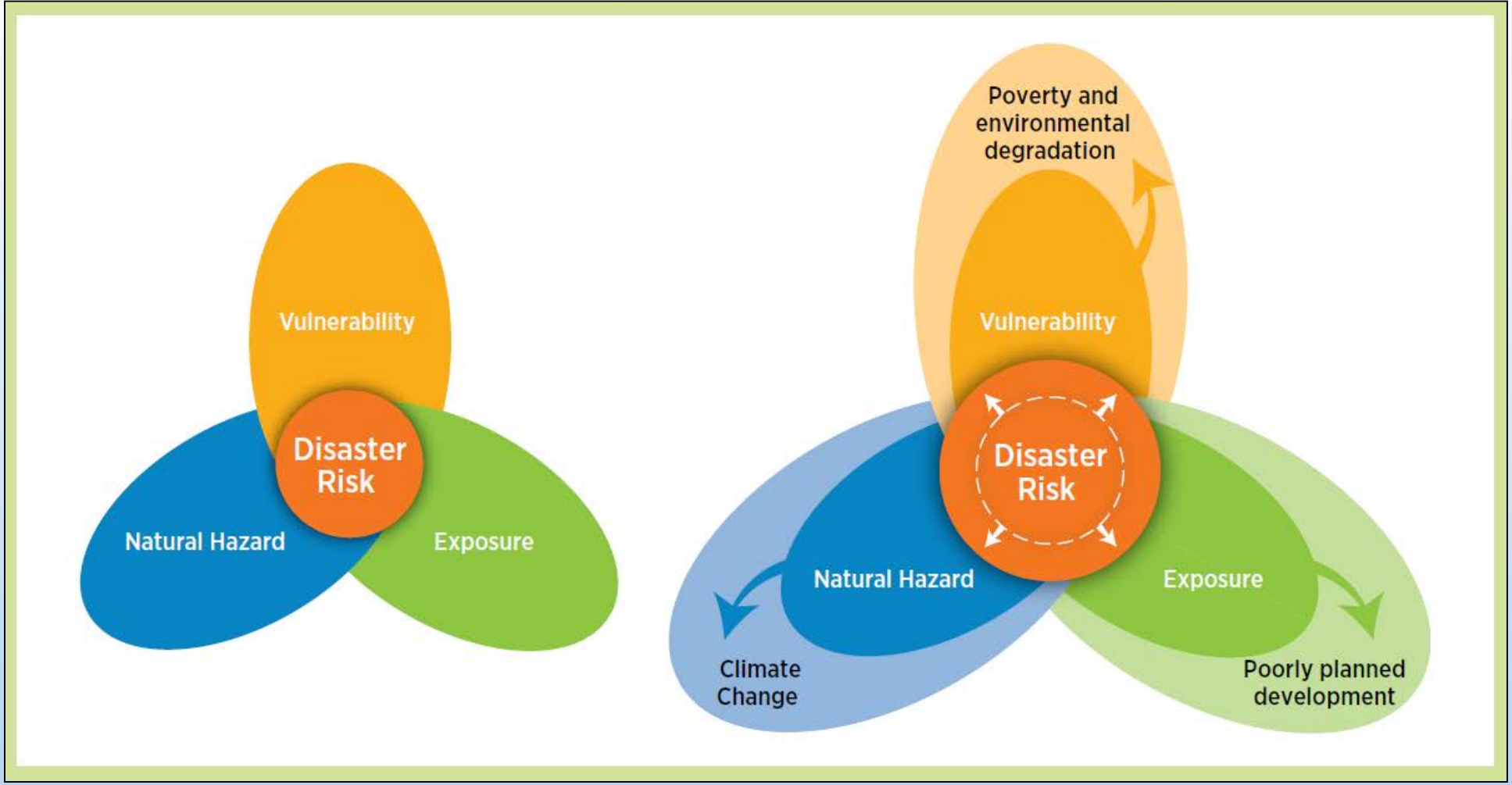
In July 2010 several hundred wildfires broke out across Russia. 56,000 people died from the effects of the smog and heat wave.

$27 billion

Australia suffered a severe flood from November 2010 to January 2011 which caused 35 deaths.

Around the world

Inaction on Climate Change



Disaster risk is determined by the occurrence of a natural hazard (e.g., a cyclone), which may impact exposed populations and assets (e.g., houses located in the cyclone path). Vulnerability is the characteristic of the population or asset making it particularly susceptible to damaging effects (e.g., fragility of housing construction).

Poorly planned development, poverty, environmental degradation and climate change are all drivers that can increase the magnitude of this interaction, leading to larger disasters.

Source: Building Resilience World Bank Group, 2013, adapted from IPCC, 2012.

RISKS TO BUSINESS

Risks cited by companies in the Standard & Poor's Global 100 Index:

Production delays
Extreme weather causes power outages or shortage of key supplies.

Higher operation costs
Changing resource availability leads to higher supply costs or greater need for backup power.

Temporary closures
Extreme weather shuts down facilities or interrupts communications, transportation or power systems that are critical for operations.

Higher capital costs
Insurance rises in price or becomes unavailable in flood-prone or coastal areas; capital needs increase for plant upgrades.

Reduced demand
Shifts in market preferences or customers' ability to pay dampen product demand.

Source: Weathering the Storm: Building Business Resilience to Climate Change, C2ES, 2013

RISKS TO BUSINESS

Risks associated to uncertainties in IA according to Montañez-Cartaxo & Catchpole:

Production delays

Unforeseen changes in the environmental or social conditions cause delay or shortage of key supplies

Higher operation costs

Impacts not considered in the ex-ante IA may arise and the mitigation measures may result very costly

Temporary closures

Social unrest may pop up during the operation of the facility if social impacts and their mitigation were not considered

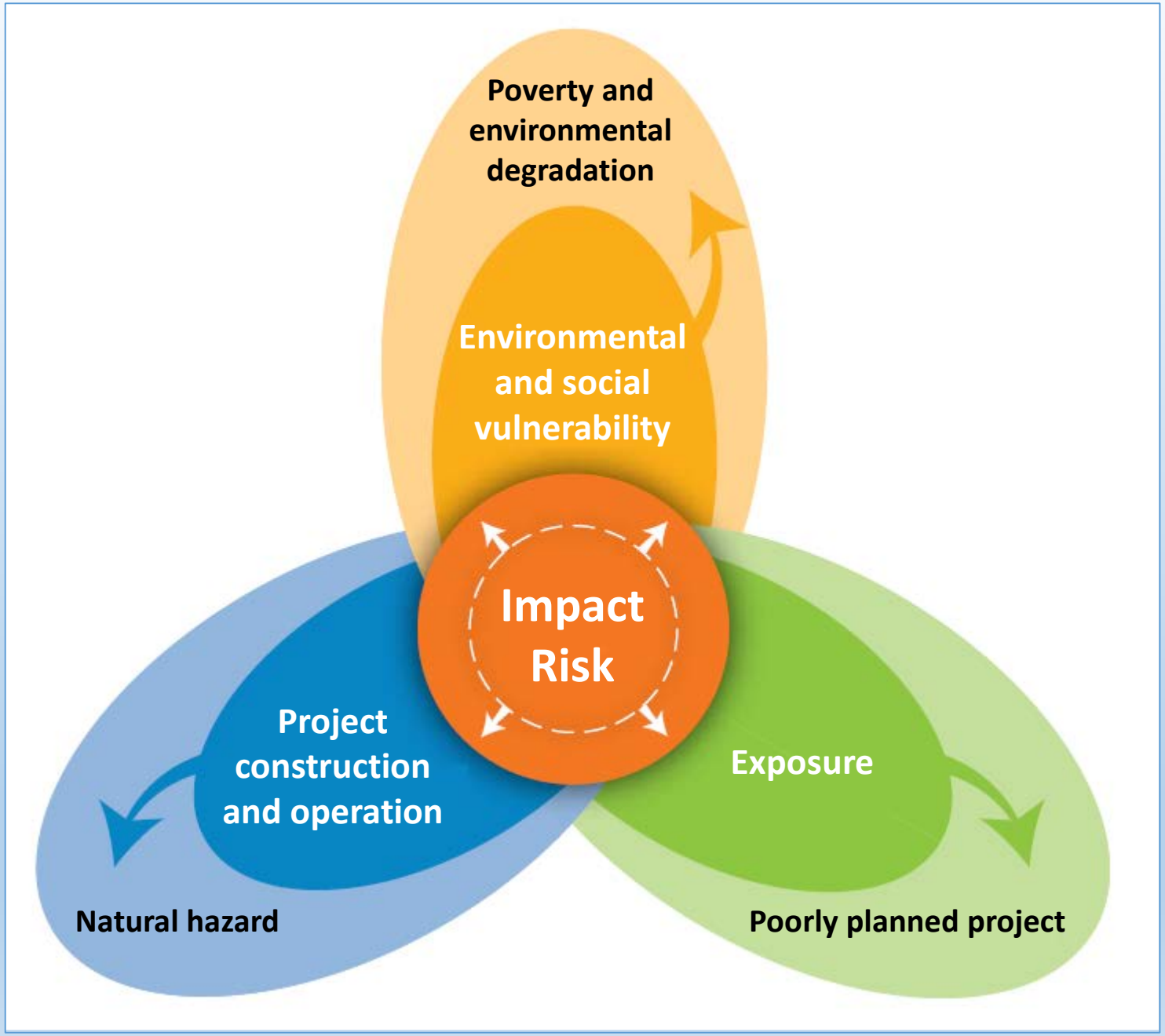
Higher capital costs

In environmental and/or social sensitive areas the facility initial cost must be higher in order to reduce operational costs

Reduced demand

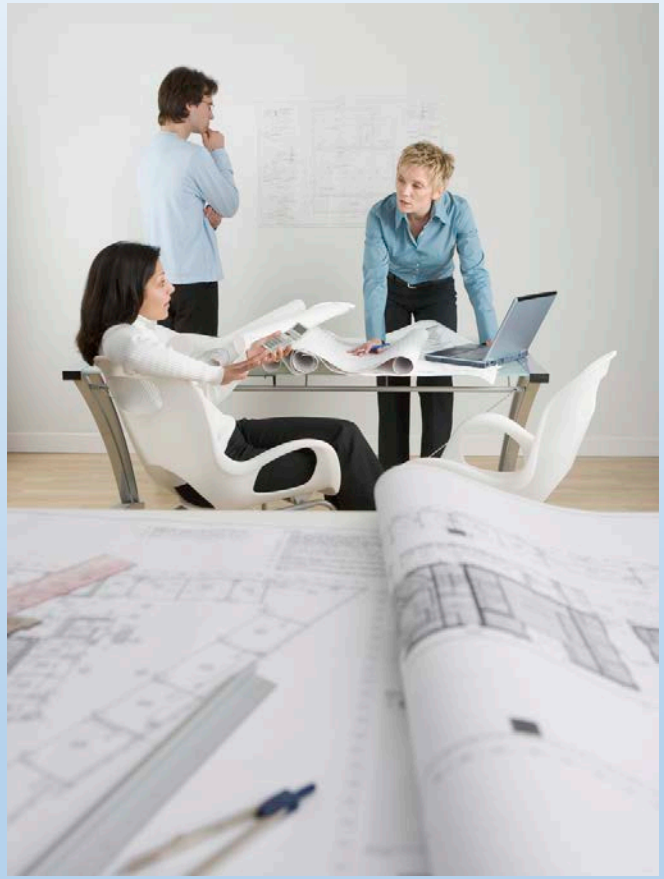
If people perceive that the company is not doing enough to avoid or mitigate impacts it will pay the price

The concept of *Risk* extended to EIA



Public Participation in Decision Making

Can social and economic development be mutually compatible? Social development should be understood not only as a result (income growth and poverty reduction) but also as a process of change that leads to equality, social and environmental justice, cultural recognition, and democratization of politics. *For this, increase in public participation in decision-making is a fundamental component of social development.*



Public Perception of Uncertainty and Risk

Public participation in EIA decision-making requires a communication of EIA uncertainties to the public. This presentation presents an overview of the concepts of uncertainty and risk in EIA, using climate change risk as a paradigm for the understanding of environmental risk.

"Risk is a proposition about future events; uncertainty is a state of current knowledge."

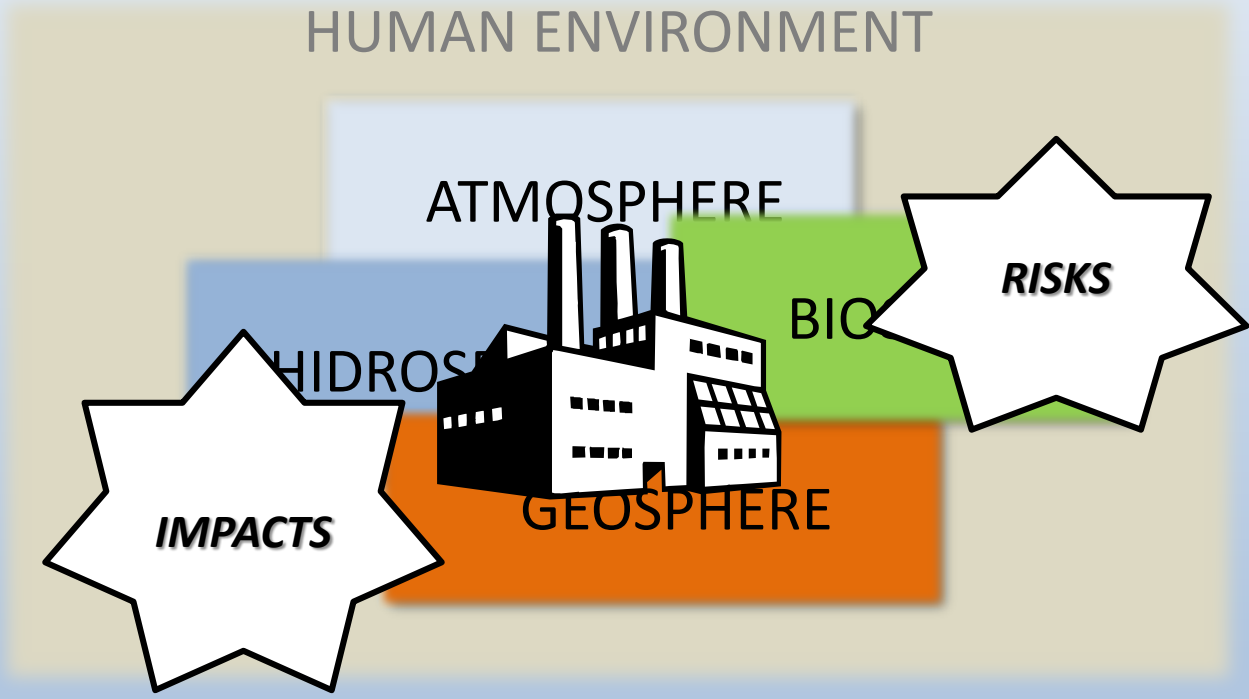
Climate Change as a Paradigm for Uncertainty and Risk

People come to terms with risk on different time frames: immediate risk of safety (e.g. a road accident), medium term risk of illness (e.g. cancer) and long term risk of environmental deterioration.

The effect of climate change provides us with an example of people coming to terms with environmental risk, and provides a paradigm of how people can assimilate environmental risk in the longer time frame.

Predictive Uncertainty in EIA

One of the relevant parts of the evaluation of environmental impacts consists of the development of an environmental scenario, in which the impacts of inserting a project in a given study area are visualized



The construction of the scenario is carried out in the framework of uncertainty with respect to the magnitude, location, extension, duration, synergy and accumulation of the impacts.

Predictive Uncertainty (Risk) in EIA

Risk is often expressed in terms of a combination of the ***consequences / impacts*** of an event (including changes in circumstances) and the associated ***likelihood / probability*** of occurrence.

$$R = p \times C$$

R *Risk*
p *probability or likelihood of occurrence*
C *Consequences f(event, vulnerability & exposure)*

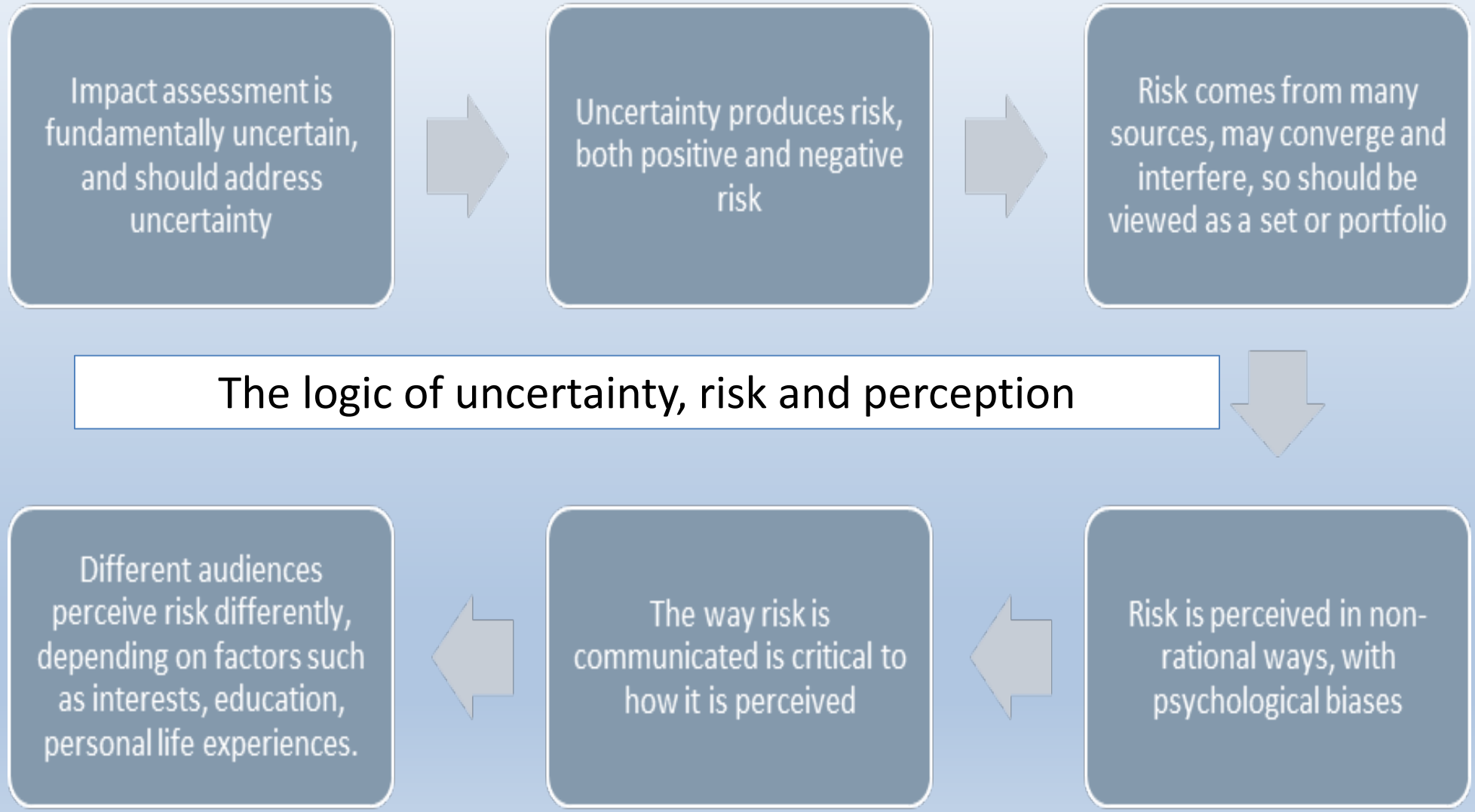
In this scheme the probability of occurrence (p) should also be represented, as well as the magnitude of the consequences (C), in order to capture the uncertainties in the representation of the scenario.

Communicating Risk to Stakeholders

EIA practitioners need risk assessment and risk communication tools . To start talking about risk we need a common vocabulary.

The ISO 31000 risk management guidelines present a definition of risk as *"the effect of uncertainty on objectives or expectations".* This implies that a given risk looks different depending on the person's objectives or expectations.

Communicating Risk to Stakeholders



Communicating Risk to Stakeholders

Therefore, the EIA practitioner should first understand the objectives and expectations of each of the parties involved in the decision-making process. Then he should frame the uncertainties and risks in the assessment in terms of these objectives, and not only in terms of the proponent's objectives, or the proponents perception of the stakeholders' objectives.

Assessing and Communicating Risk in EIA

1. Recognize where uncertainty exists in the environmental assessment, and do not pretend that it does not exist.
2. Adopt the rules of risk assessment when confronted with uncertainty in impact assessment. Considers ranges or scenarios and their likelihoods and severity of consequences.
3. Understand the objectives and expectations of each of the parties involved in the decision-making process, and frame the uncertainties and risks in the assessment in terms of these objectives.
4. Express the uncertainty and the assessment in general in language that the stakeholder groups can understand and in terms that they can relate to.
5. With the risk or potential impact, provide adaptation or response options.
6. Allow feedback into the IA process in pursuit of a common understanding and a negotiated agreement of impacts on objectives.

You can ask the presenters anything you want,

without risk!