

Lagos



Bangkok

# Coastal Cities at Risk – Building Adaptive Capacity for Managing Climate Change in Coastal Megacities

Assessing the Vulnerability of Coastal Cities in a Changing Climate

The Adaptation Tag Team- Trans-disciplinary Approach



Vancouver

CCaR



Manila



Social Sciences and Humanities  
Research Council of Canada

Conseil de recherches en  
sciences humaines du Canada

Canada

# Coastal Cities at Risk (CCaR)

- **Co-Principal Investigators: G. McBean, Western University, Canada; A. Snidvongs, Chulalongkorn University and R. Cooper (SEA-START)**
- **Mega-cities in coastal zone and on river deltas: Vancouver, Bangkok, Manila, Lagos- and partnering with other city research teams – Shanghai, +++**
- **Interdisciplinary - natural, engineering, socio-political-economic and health scientists**
- **2011-2016 – 2015-16 – our last year**



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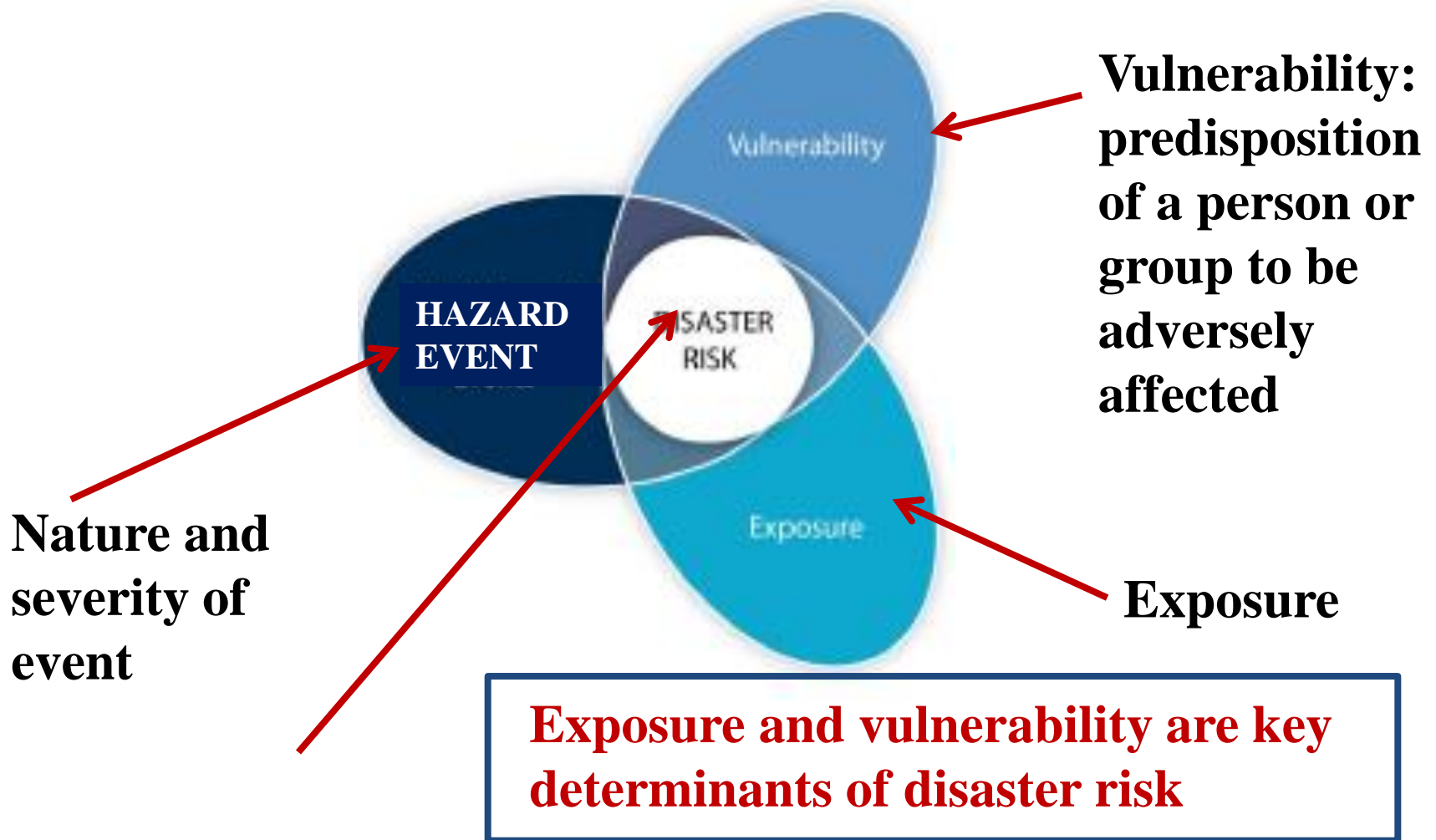
[www.coastalcitiesatrisk.org](http://www.coastalcitiesatrisk.org)

# CCaR – Objectives

- To develop the knowledge base and enhance the capacity of mega-cities to successfully adapt to and when necessary cope with risks posed by the effects of climate change, including sea level rise, in the context of urban growth and development.
- A. *Advance knowledge of climate change adaptation and disaster risk reduction:*
- B. *Develop strategies and methodologies for climate change adaptation:*
- C. *Enhance practitioner and academic capacity and transfer knowledge:*

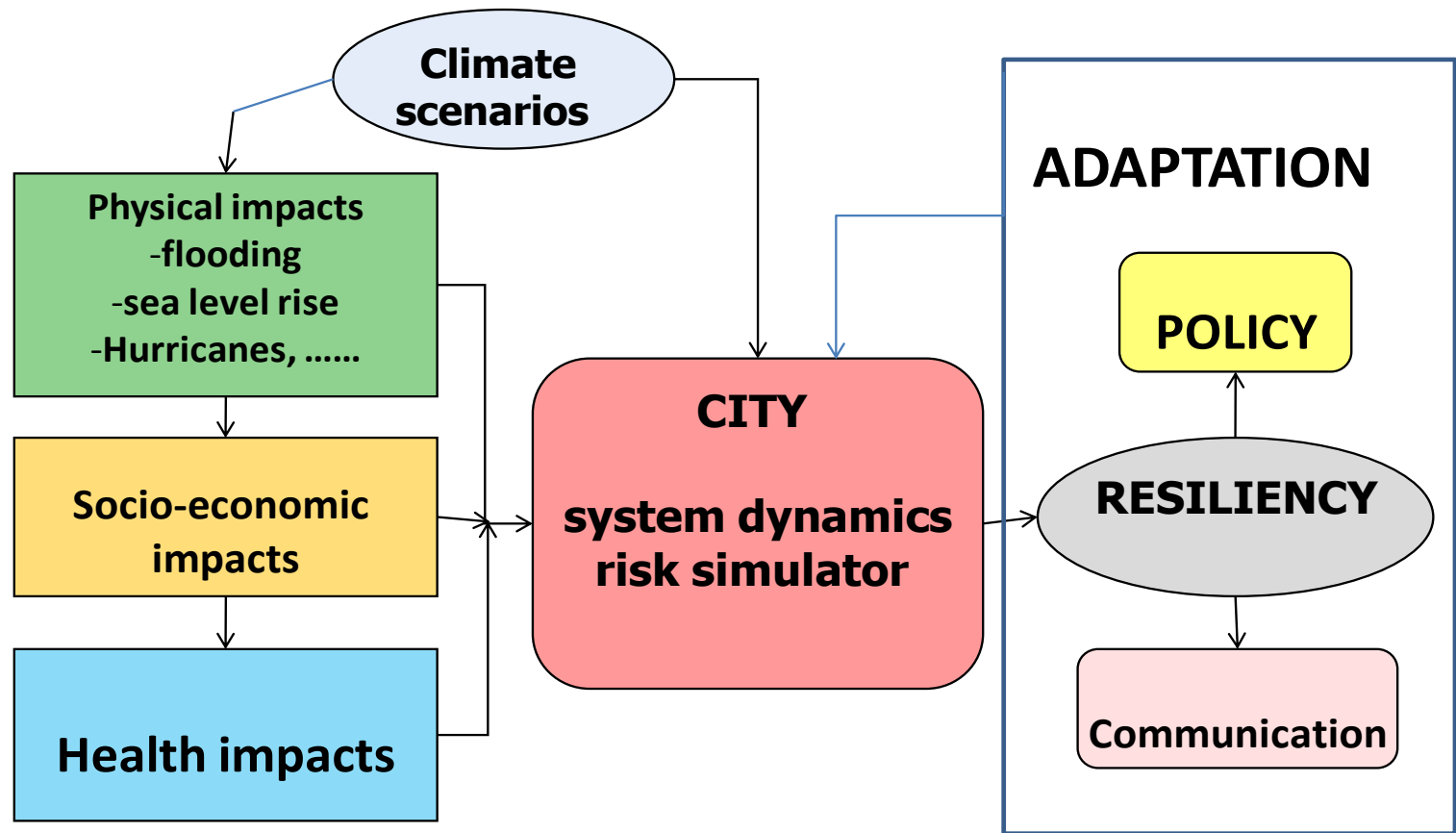
The research program integrates climate change adaptation and disaster risk reduction approaches towards building disaster resilient cities.

# Impacts from hazard events depend on:



**Disaster Risk: the likelihood of severe alterations in the normal functioning of a community or society due to hazard events interacting with vulnerable social conditions**

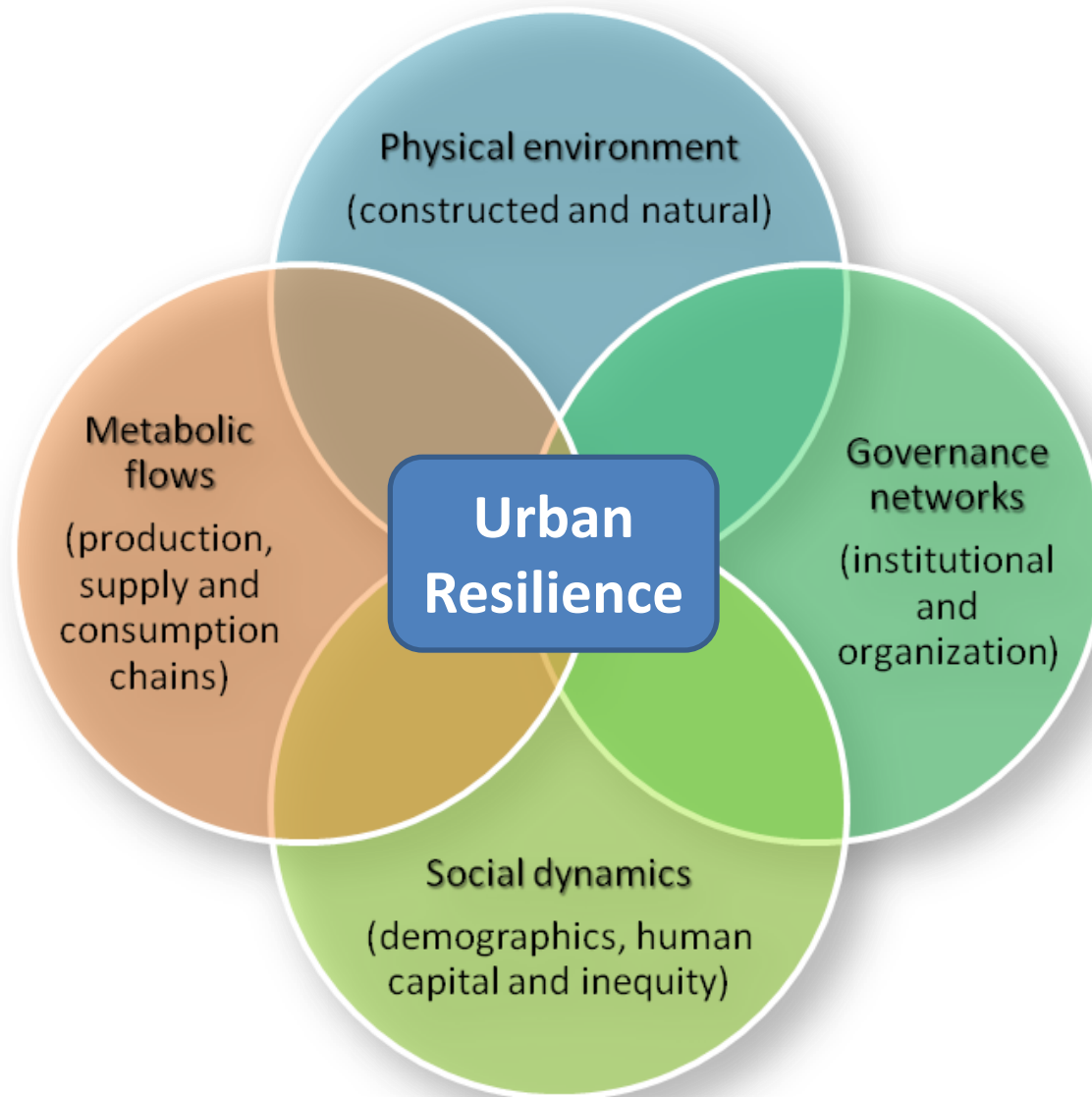
# City System Dynamics Risk Simulator



**Resilience.** "an ability to recover from or adjust easily to misfortune or change."

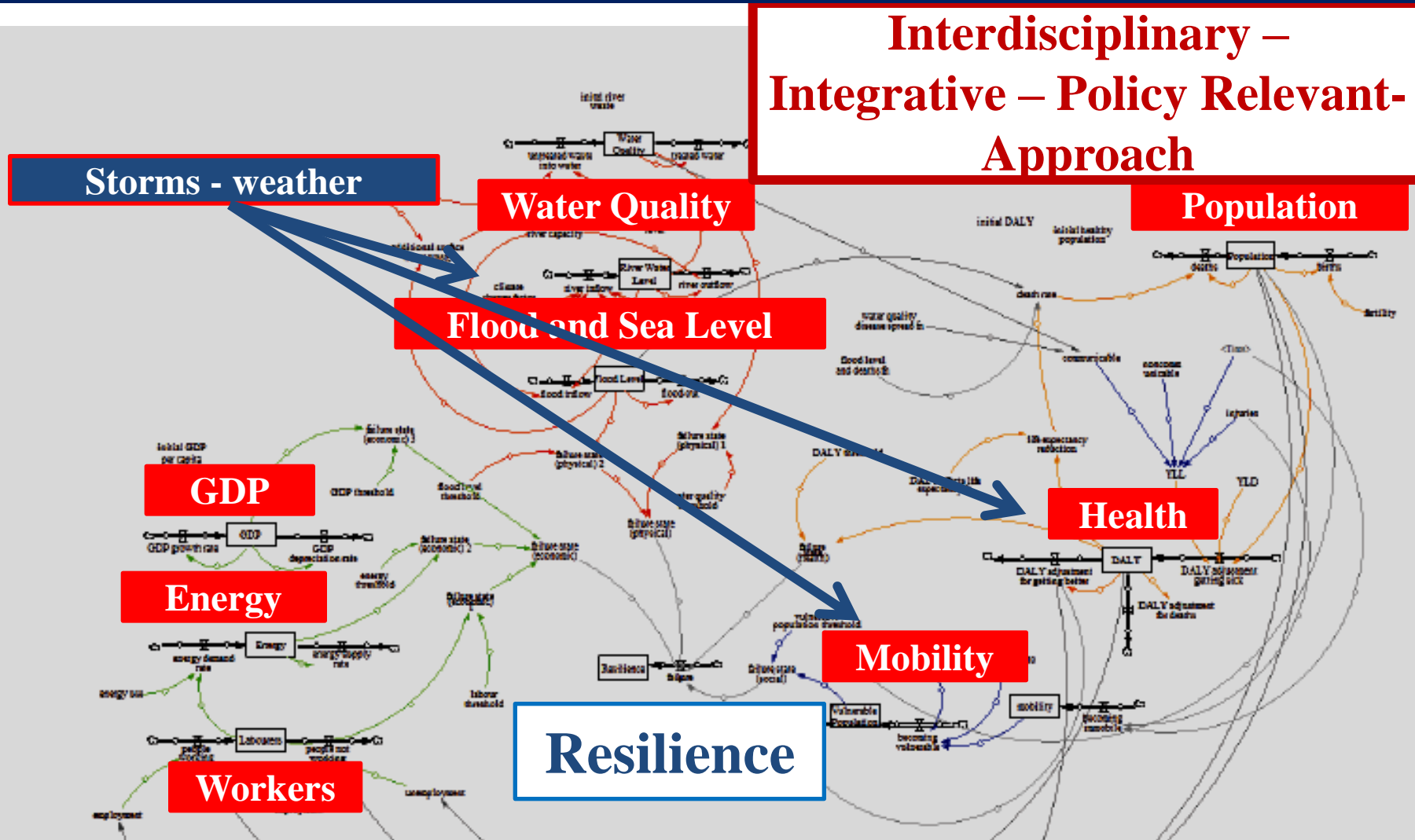


# MODELING URBAN RESILIENCE

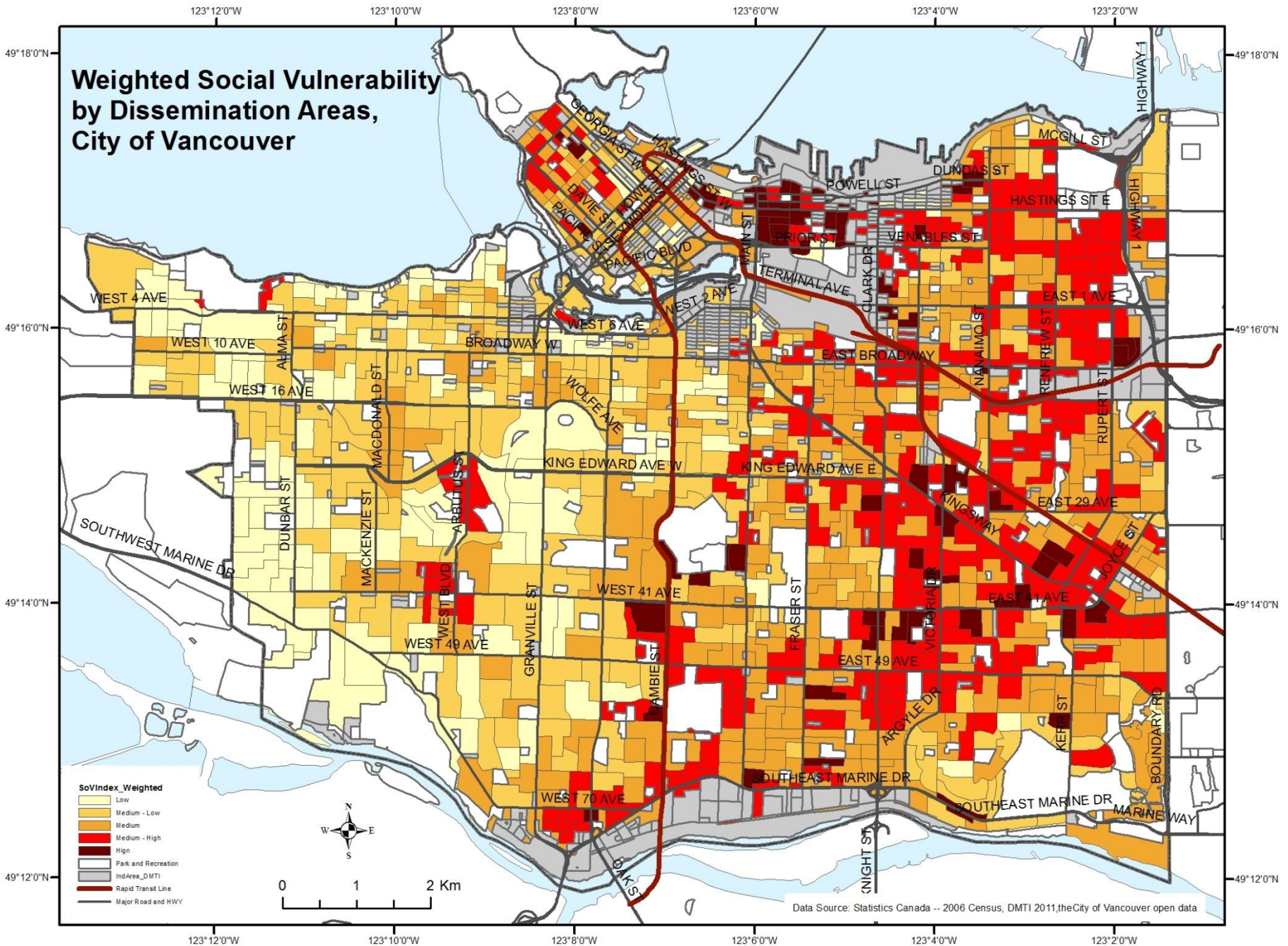


# MODELING URBAN RESILIENCE

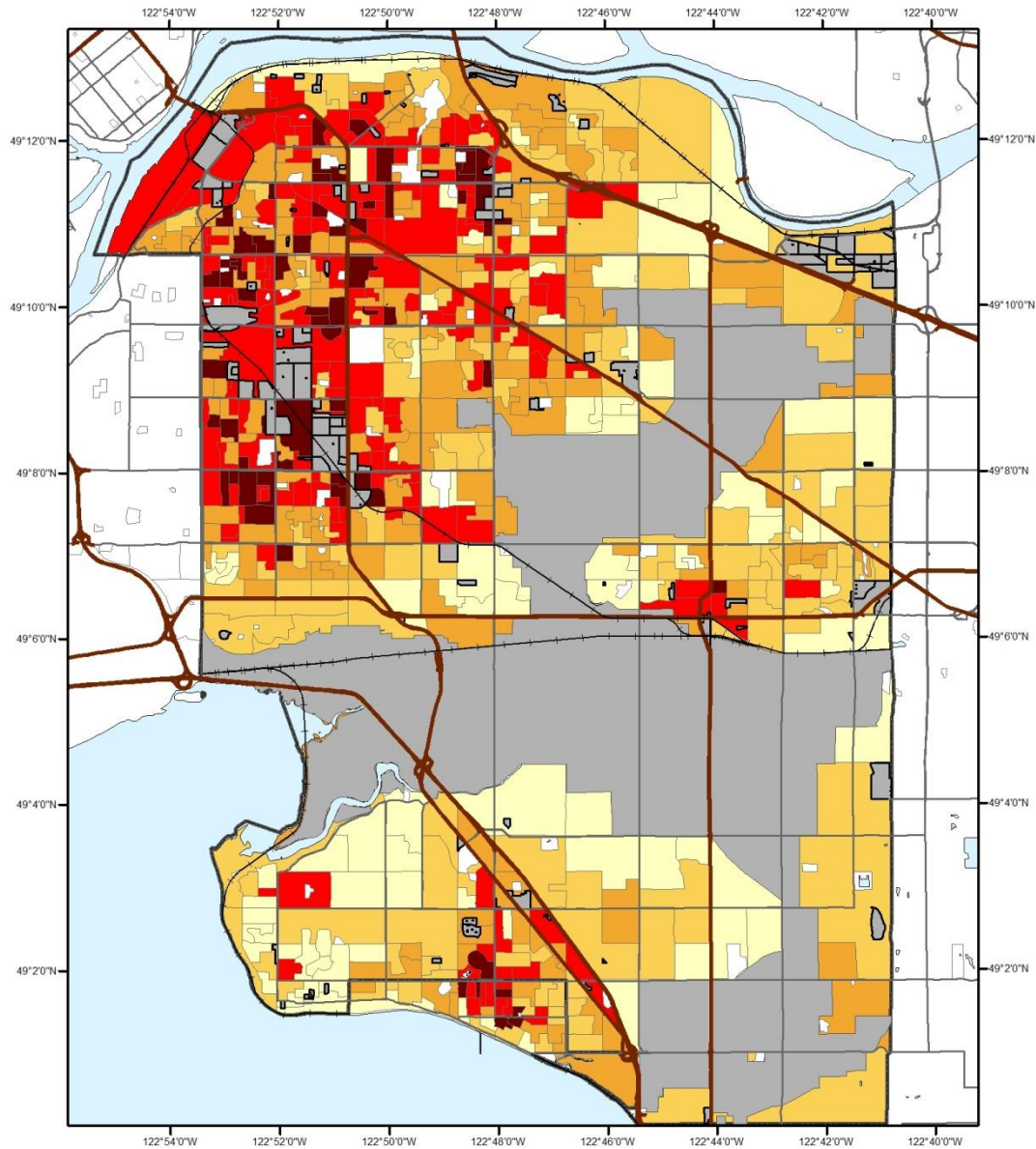
**Interdisciplinary –  
Integrative – Policy Relevant-  
Approach**



**Which adaptation options give the best resilience?**

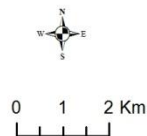






InduArea\_Surrey  
 Water  
 Park and Recreation  
 Railway\_Surrey  
 BC Highway  
 Major Road and HWY

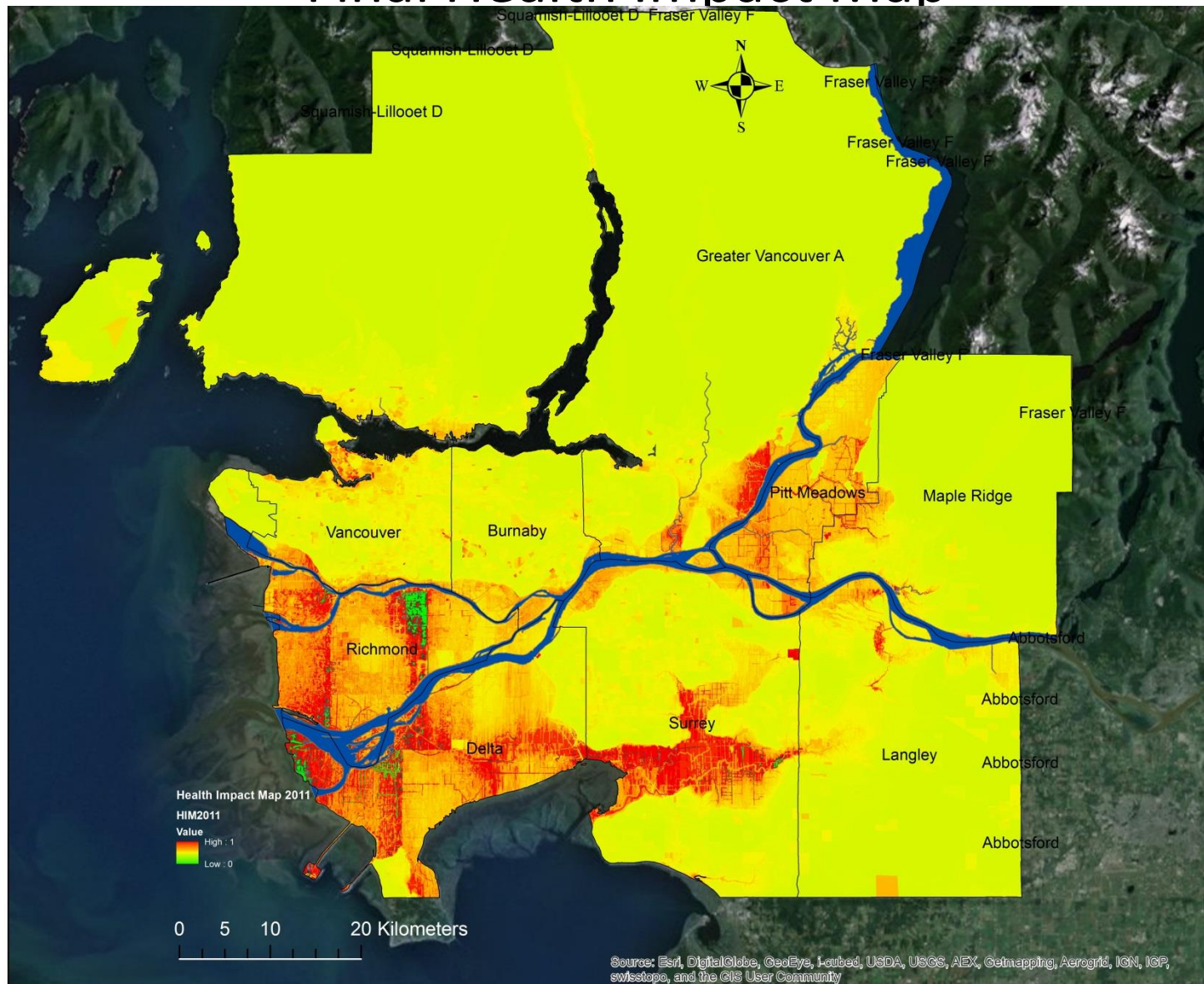
**SoVI Score**  
 Low  
 Low - Medium  
 Medium  
 Medium - High  
 High



## Weighted Social Vulnerability by Dissemination Areas City of Surrey, BC

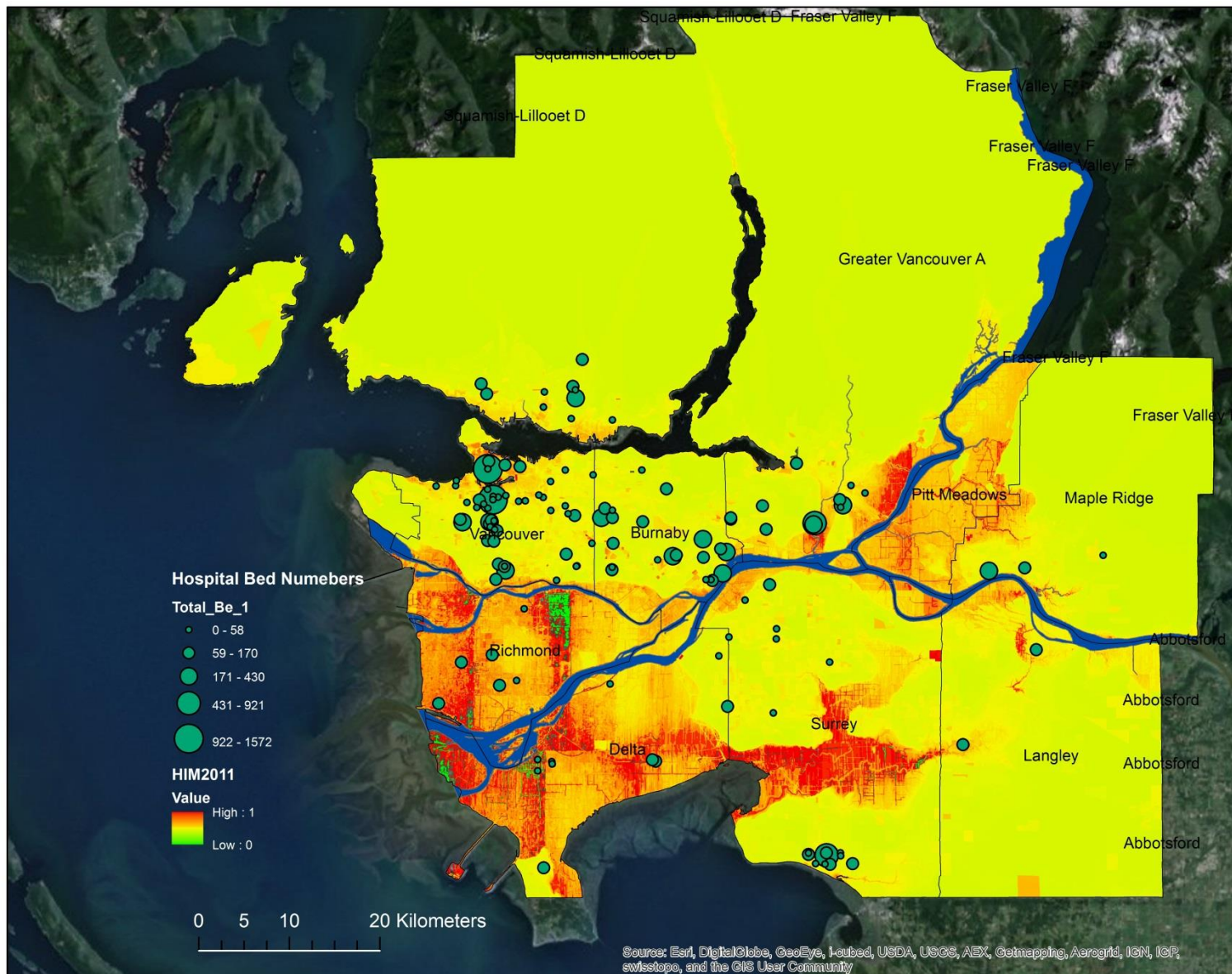
Data Source: Statistic Canada -- 2006 Census, DMTI 2011, City of Surrey

# Final Health Impact Map





# Hospital and health services location



# THE FUTURE WE WANT

## I. Our Common Vision

- Rio de Janeiro, Brazil, from 20-22 June 2012,
- 13. We recognize that people's opportunities to influence their lives and future, participate in decision making and voice their concerns are fundamental for sustainable development. We underscore that sustainable development requires concrete and urgent action. It can only be achieved with a broad alliance of people, governments, civil society and private sector, all working together to secure the future we want for present and future generations.**



# Policy Issues for Governments

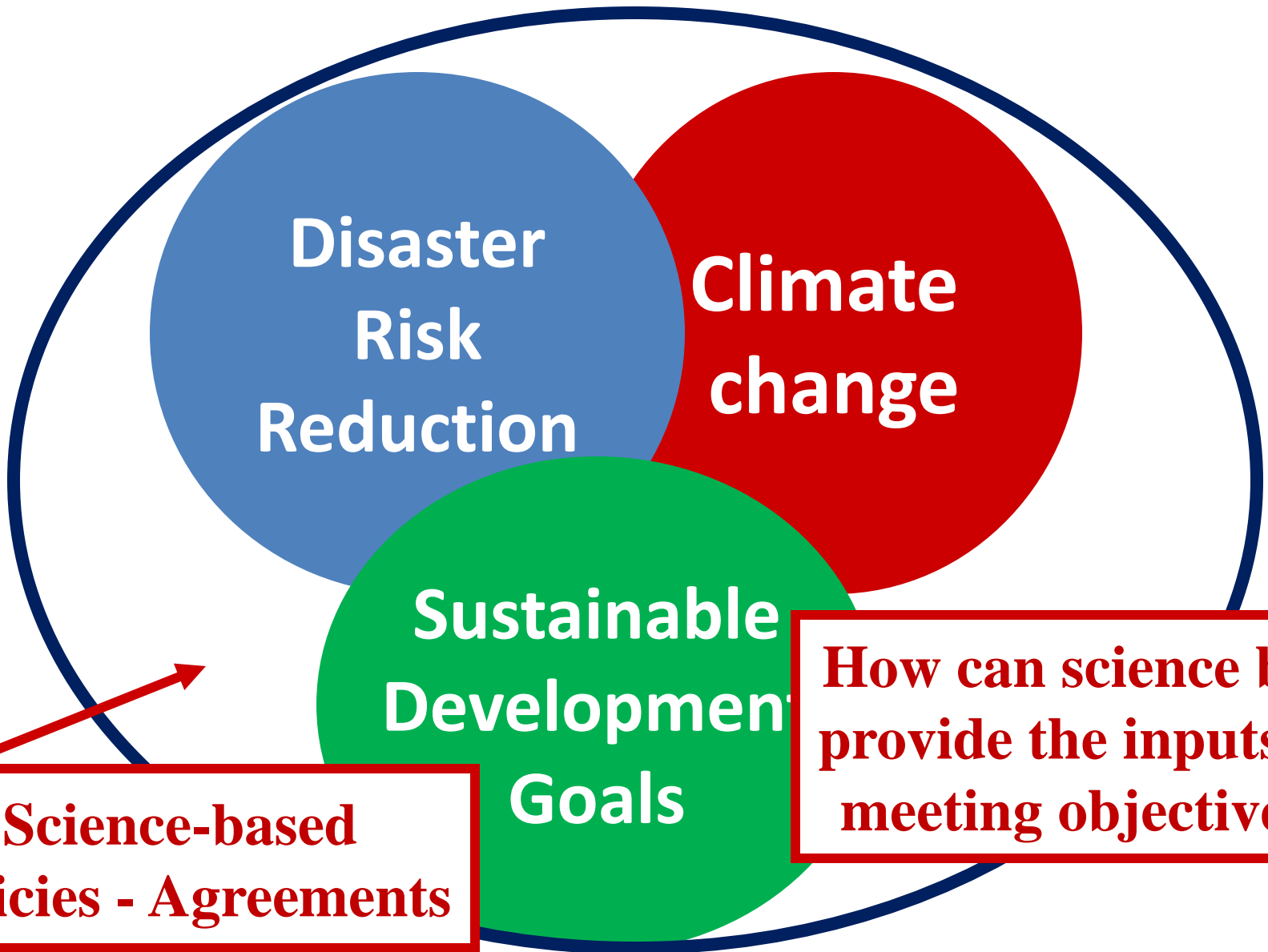


**SDGs – 2015**

**DRR – Sendai - 2015**

**Climate – Paris - 2015**

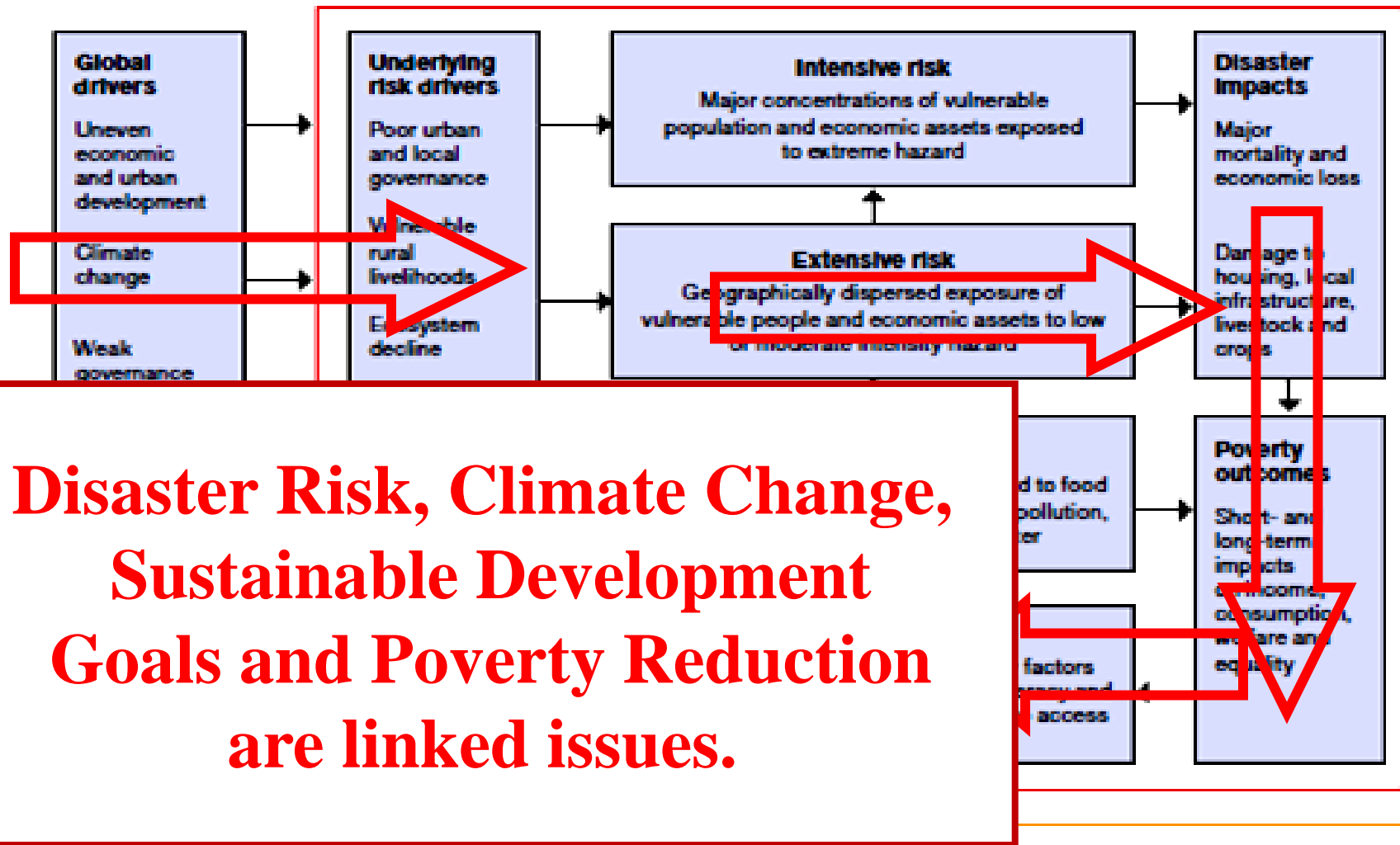
# Policy Issues for Governments



**Science-based  
Policies - Agreements**

**How can science best  
provide the inputs to  
meeting objectives?**

# Disaster Risk-Poverty Nexus



BELMONT  
FORUM

## Goal:

To provide the knowledge  
required for societies in the world  
to face risks posed by global  
environmental change and to seize  
opportunities in a transition to  
global sustainability



INTERNATIONAL  
COUNCIL  
for SCIENCE



WMO





# Themes

## Dynamic Planet



- projecting environment
- **Approaches and Models**
  - drivers
  - societal system
  - observing
- **States and Trends**
  - explaining
  - thresholds
  - understanding
- **Critical Zones**
  - coasts
  - tropical forests
  - polar regions

## Global Development



- clean air
- **Stewardship of resources**
  - mining
  - materials
  - biodiversity
- **Ecosystem services**
  - Trade-offs
  - climate change
  - ficheries
- **Equitable access**
  - food security
  - water availability
  - healthy environment

## Transformations towards Sustainability



- decision making
- **Transformation process**
  - economy
  - mega-cities
  - development options
- **Innovation and ideas**
  - trade-offs
  - emerging technology
  - assessment of policies
- **Global and regional governance**
  - incentives
  - international law
  - regional enforcement

**Social equity**  
**Poverty reduction**  
**Human rights**  
**Security**  
**Violence**  
**International Law**  
**Data and information**

....

**Connecting:**  
**Regional -**  
**National**  
**Programs**  
**Others**

.....

# Fostering co-design and co-production of knowledge under Future Earth

**futureearth**  
research for global sustainability

## Opportunities

- Assessment and Convention processes
- National, Regional and International confs. – Unions
- ...

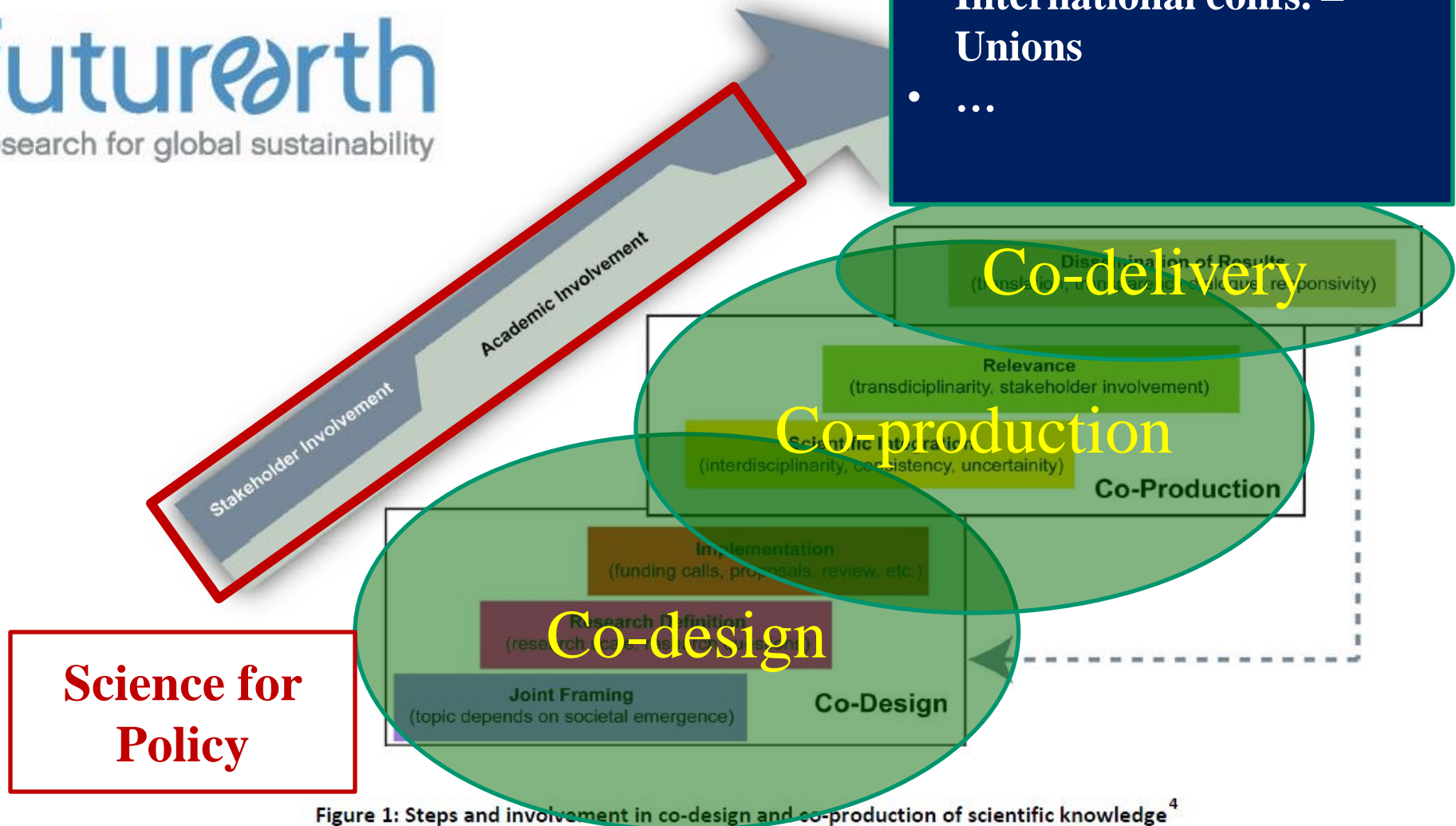


Figure 1: Steps and involvement in co-design and co-production of scientific knowledge<sup>4</sup>

## Engagement Committee:

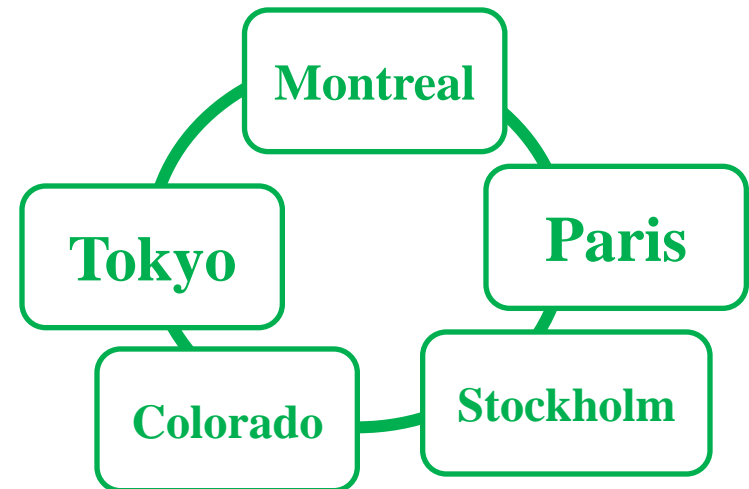
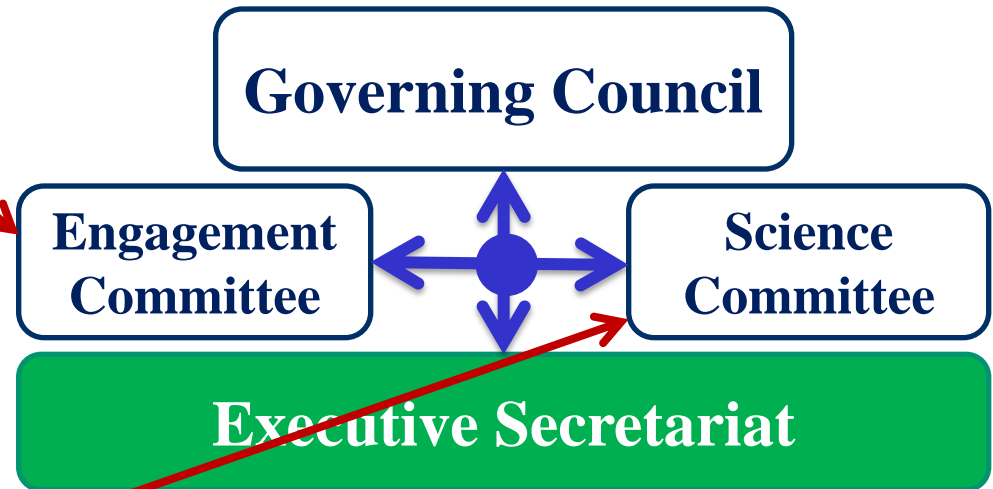
- To include voices from e.g. business, civil society and government
- Role in outreach, communication, regional activities

## Science Committee:

- Provide scientific guidance, propose new projects and priority issues, and

**Canadian Future Earth program – how to move ahead**

**They all must work closely together**



**5-hub Model**

# Integrated International Science + Policy

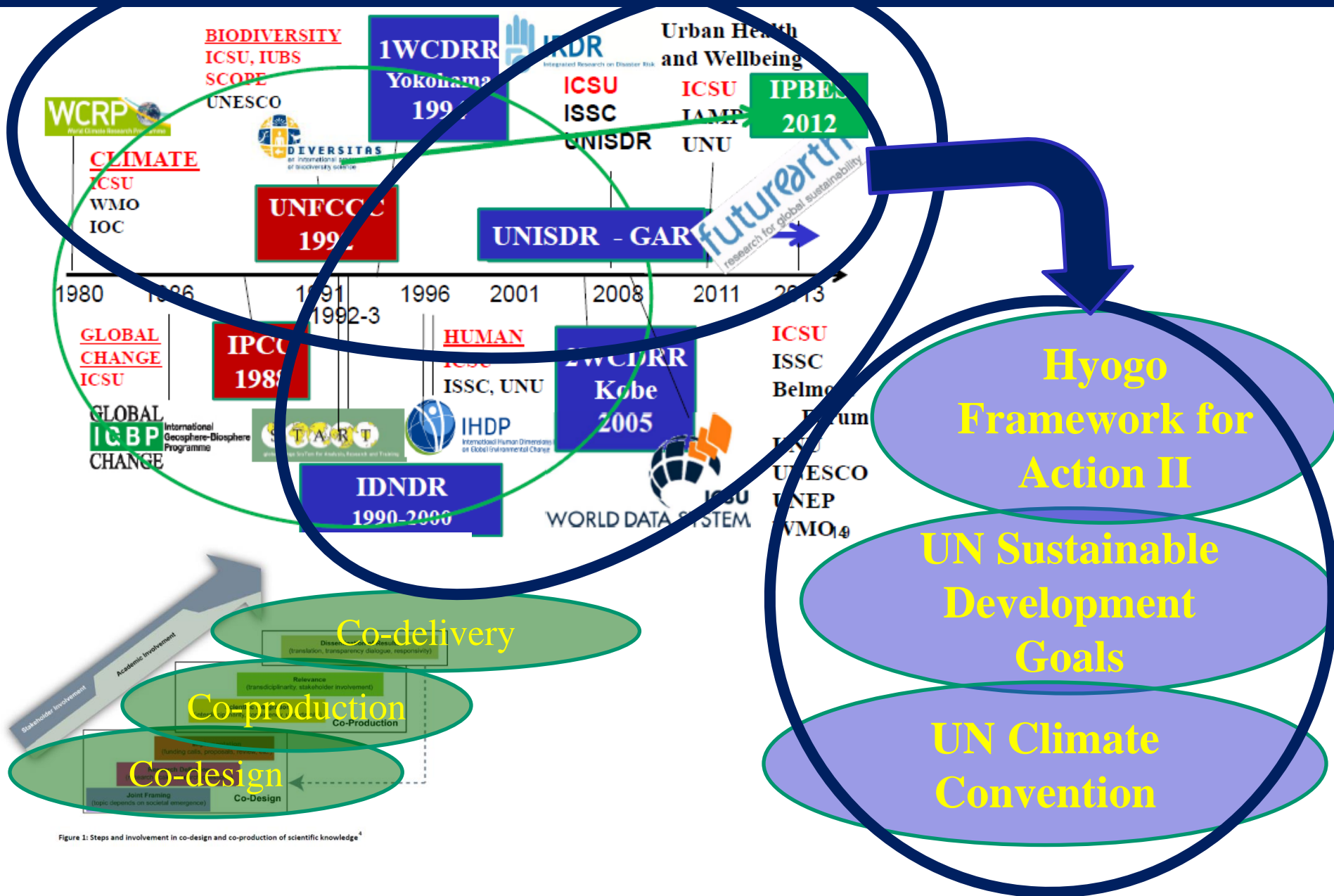


Figure 1: Steps and involvement in co-design and co-production of scientific knowledge<sup>4</sup>



The background of the slide is a collage of several photographs. At the top left, two women are standing outdoors. To their right is a blue sky with white clouds. Below the women is a flooded street with a traditional golden-roofed building in the background. To the right of the flooded street is a flooded market area with people and debris. At the top right, there is a blue sky with clouds and a building with a blue roof. Below that is a body of water reflecting a building.

# **Coastal Cities at Risk (CCaR):** **Building Adaptive Capacity for Managing** **Climate Change in Coastal Megacities**

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**Thank you for your participation**