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Research in Climate change adaptation and human health:

vulnerability assessment, health risk assessment, and health impact assessment

By

Cordia Chu and Scott Baum
Centre for Environment and Population Health

Presentation outline

- Introduction: Research Gaps in CC and health
- Step-wise problem solving process from Scoping to adaptive planning
- Terms, methods, and issues in the health fields in dealing with climate change adaptation research
- Integration and knowledge sharing in ACCC Project

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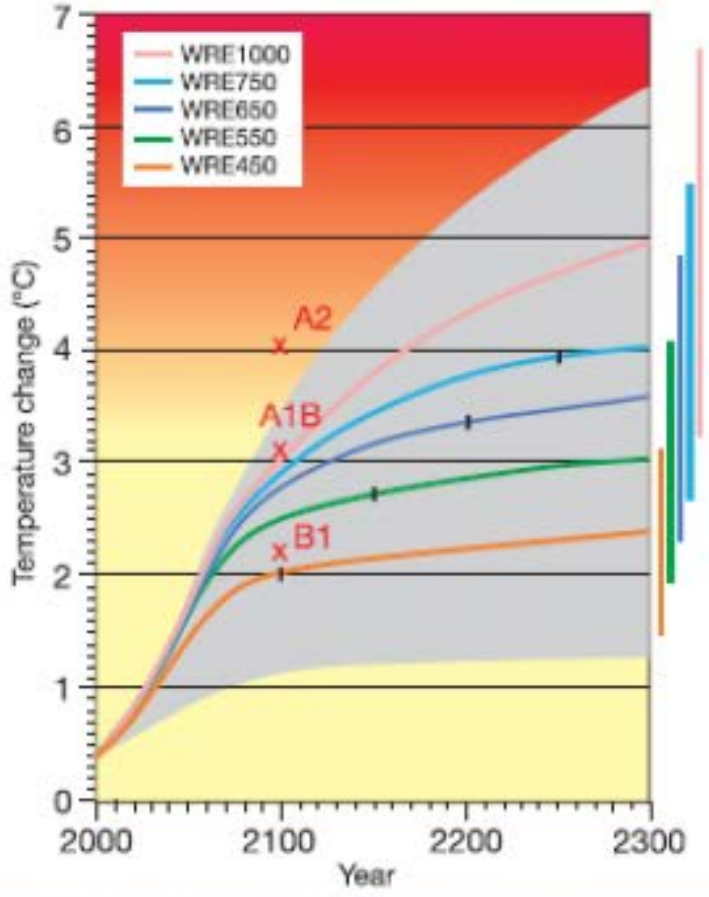
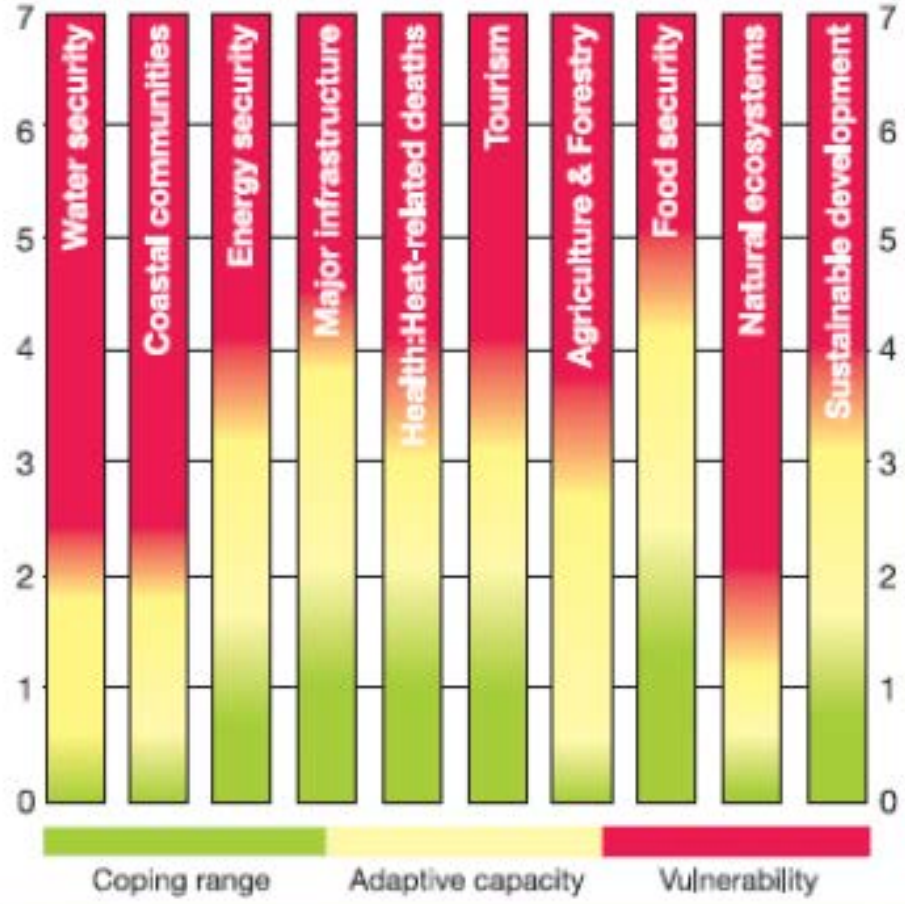
- Step-wise problem solving process from Scoping to adaptive planning
- **Terms, methods, and issues in the health fields in dealing with climate change adaptation research**
  - From vulnerability assessment to health risk assessment, to health impact assessment
  - Assessing vulnerability:
    - *physical, social and system (the health sector) vulnerability,*
    - *national, regional, and local measurements*
- Integration and knowledge sharing in ACCC Project

Interdisciplinary and integrative approach, involving multiple sectors and stakeholders for CC adaptation

- Health sectors **must** develop **adaptive strategies** to minimise adverse health impacts of climate change,
- Paying special attention to address the needs of the **vulnerable populations**,
- to assess and improve **public health system response capacity,** and
- to **carry out adaptive measures**.

Much research has focused on studies of **climate-health relationships**, **via modelling, the estimation of future health risk**





Source: IPCC, 4th Assessment Report 2007

Research into **health impacts** is very **limited**

Existing knowledge and research gaps on **climate change and health** in Australia--NCCARF

Emerging priority areas for future research include:

- **Identification** of **risk by region**,
- **Preparedness** of **local** **primary health care services** and occupational health services;
- And **integration of** climate-related **health data** across primary, secondary and tertiary health services

Climate Change and Human Health

Management of the health effects of climate change will require inputs from all sectors of government and civil society, collaboration between many academic disciplines, and new ways of international cooperation that have hitherto eluded us.

-Lancet and University College London Institute for **Global Health Commission vol** 373, May 16, 2009

Involvement of **local communities** and **relevant sectors** in monitoring, discussing, advocating, and assisting with the **process of adaptation** will be crucial**!**

STAKEHOLDER Engagement is vital but challenging

An integrated and multidisciplinary approach is urgently needed to address the adverse health effects of climate change

Health and climate change: a roadmap for applied research

--**WHO global consultation group 2008** recommended immediate research needs

- *Crucially important is the need to build* ***interdisciplinary research capacity,***
- *with a focus on the ….****most vulnerable to the health effects*** *of climate change….*
- ***Translational research*** *to develop* ***policy and strategies*** *to meet the needs of* ***users*** *or* ***decision-makers*** *urgently needed.*

Interdisciplinary research: Benefits and challenges

- Interdisciplinary research aims "to synthesize discipline-specific insights for the purpose of **resolving problems** …." (Higginbotham *et al.*, 2001)
- **Interdisciplinary** work involves **integration** of ideas from different disciplines;
- **But communication across disciplines is difficult!!!**

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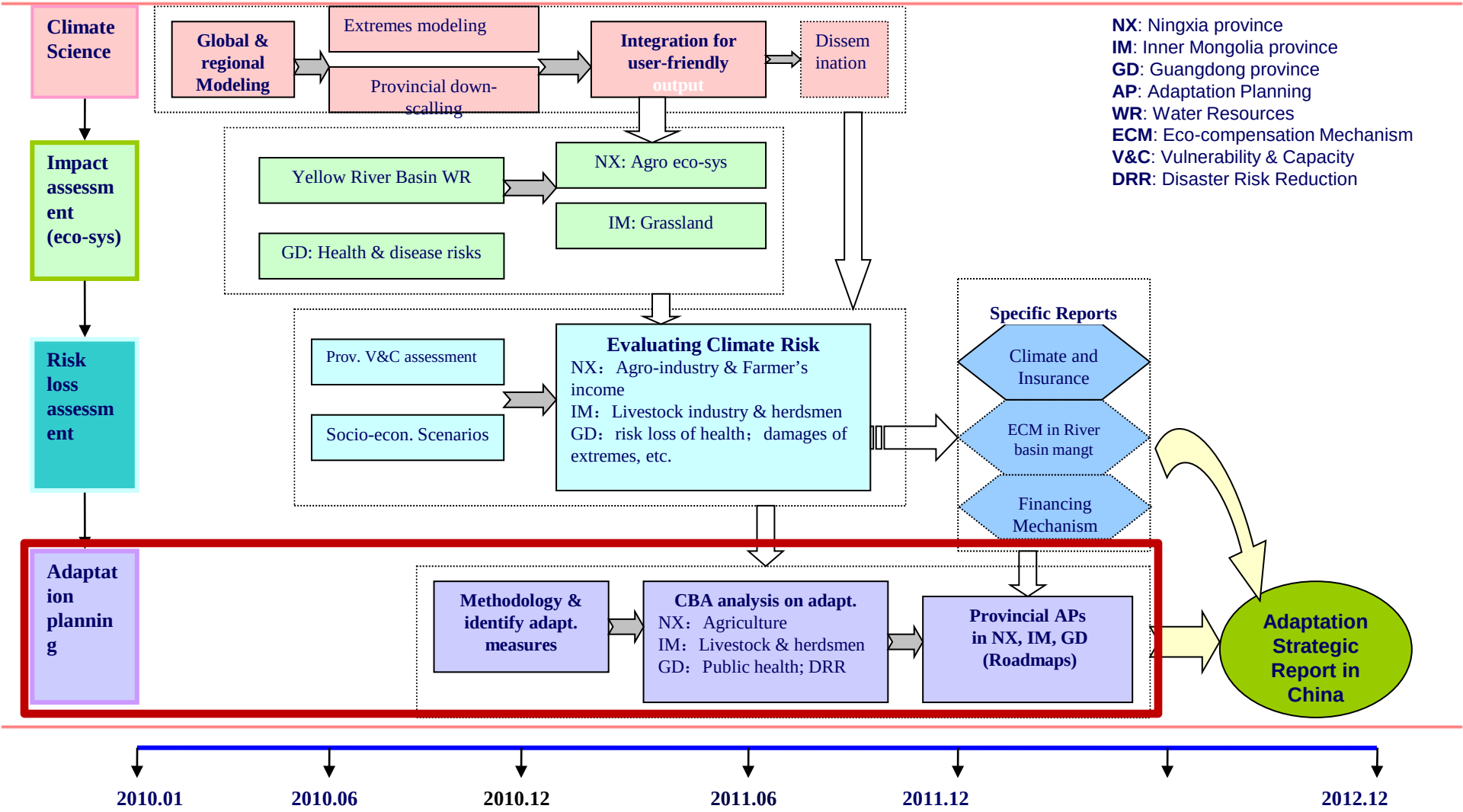
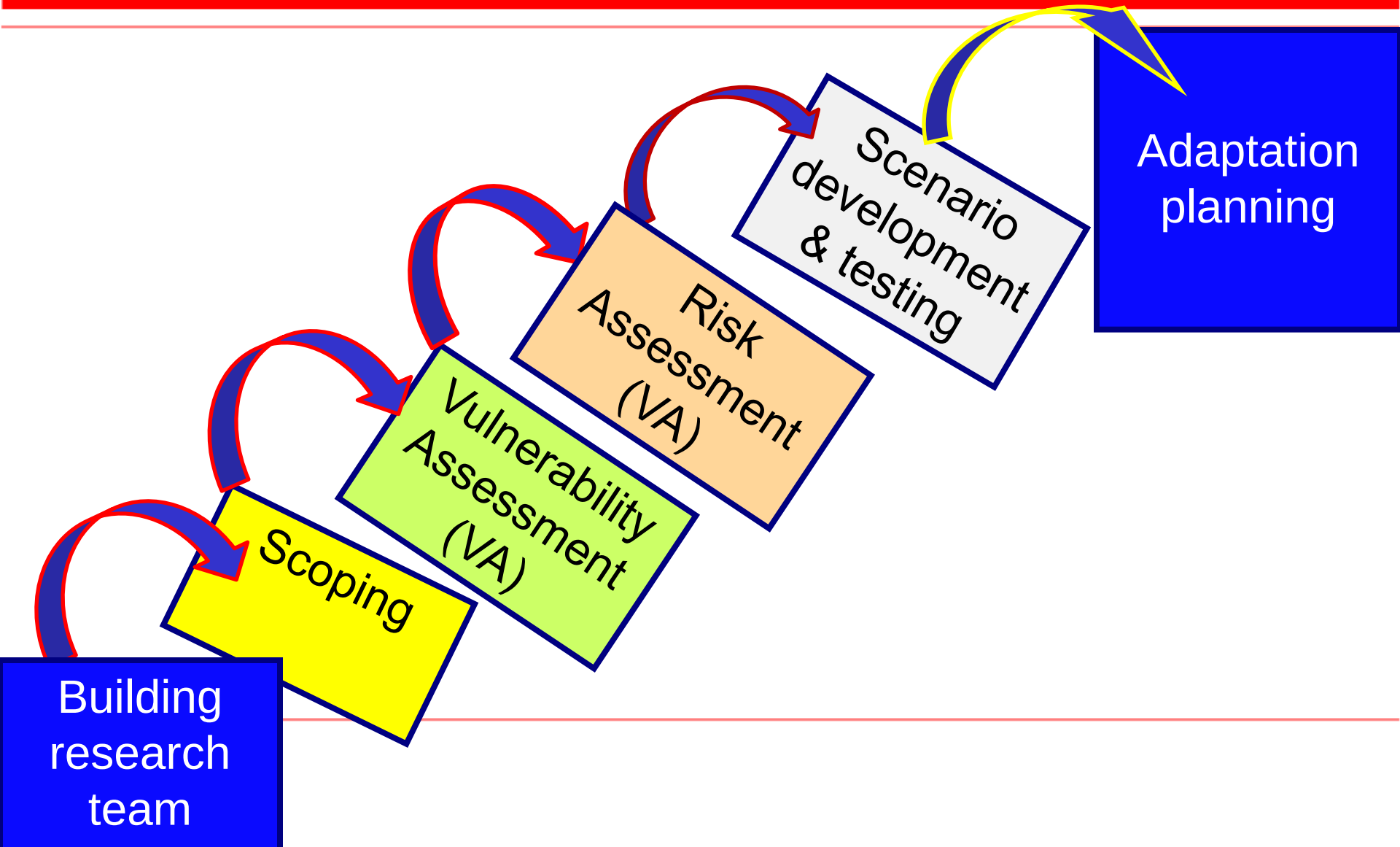
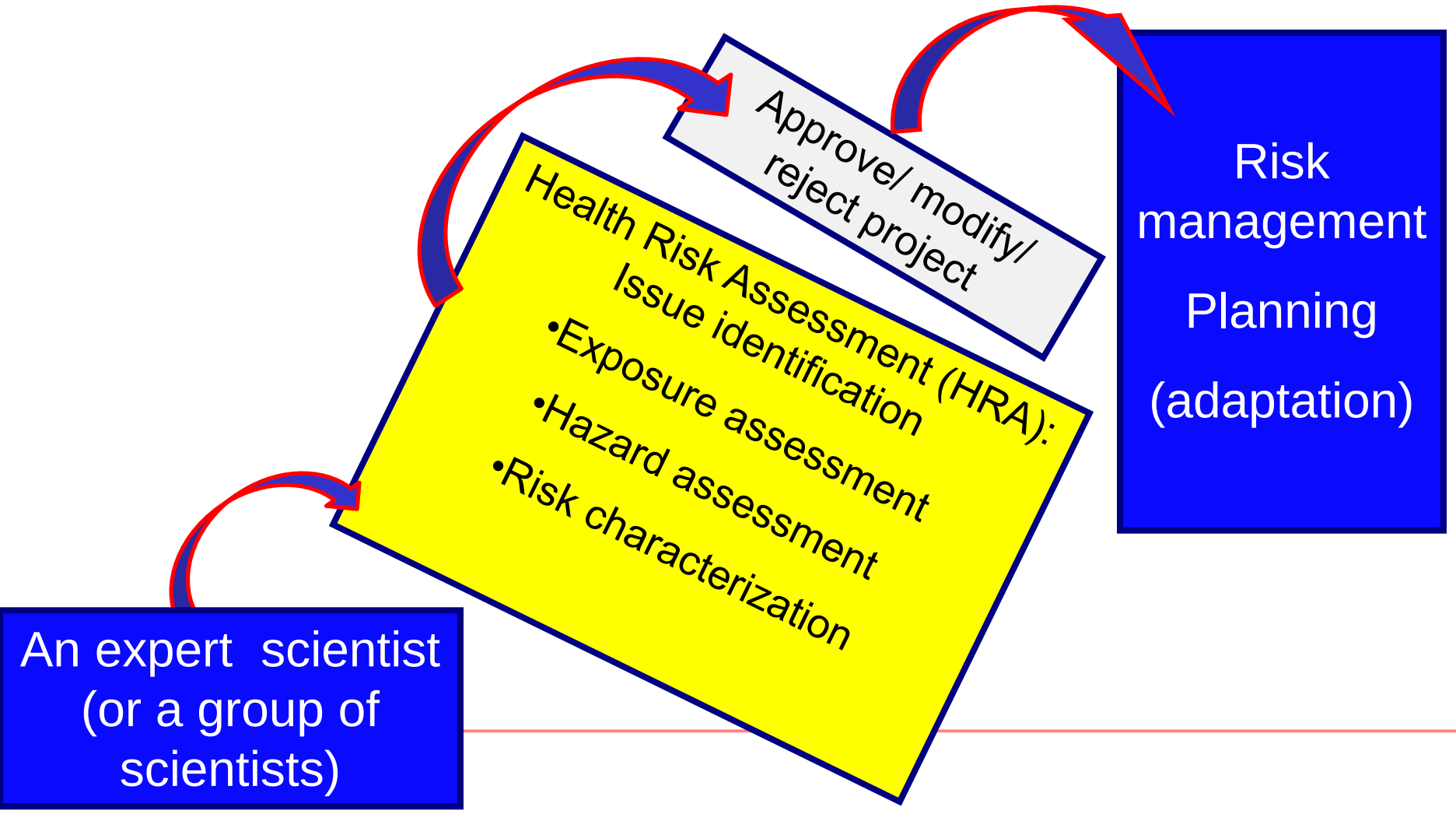
ACCC Project Roadmap



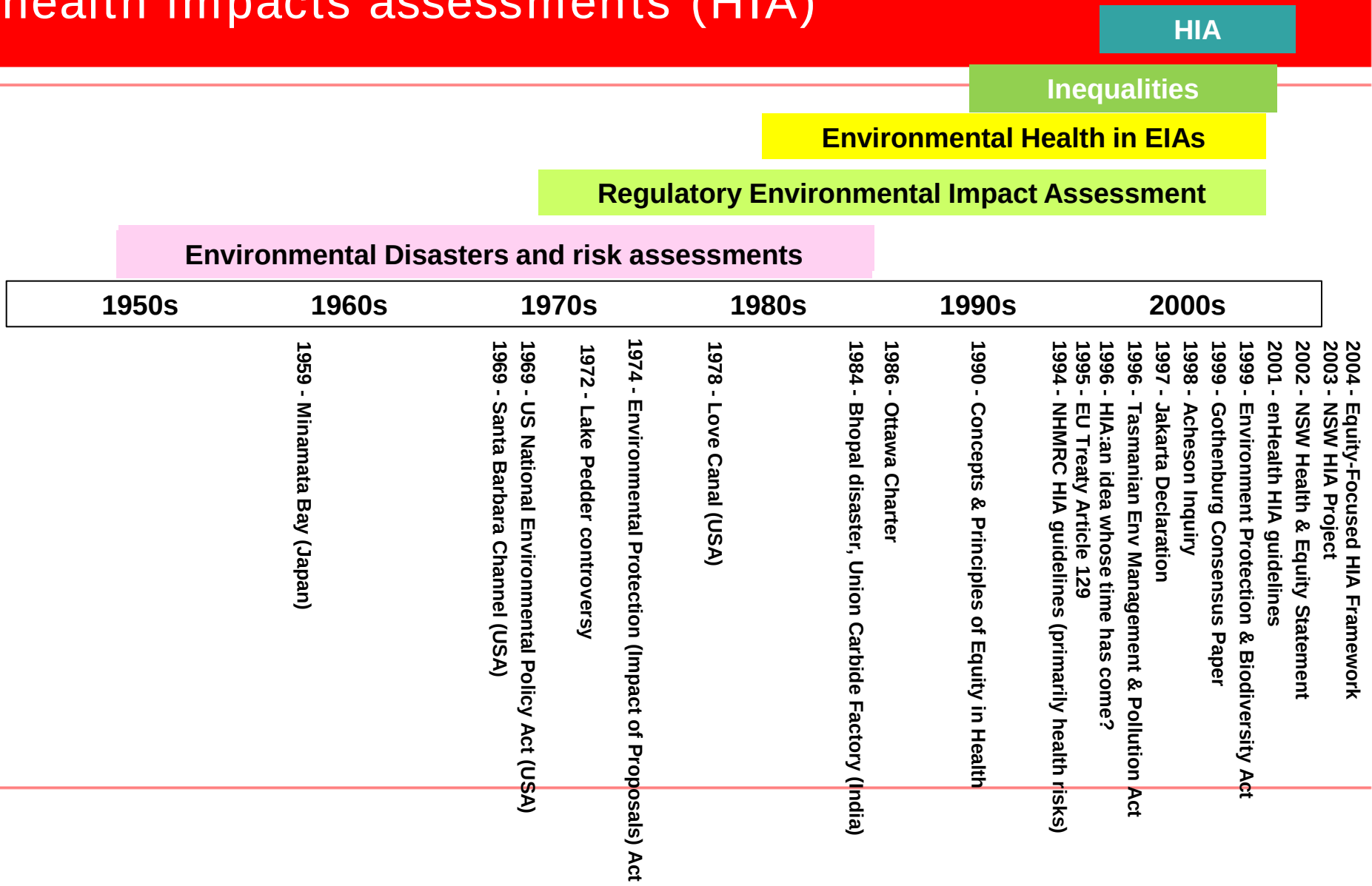
Spiral Steps to climate change adaptation research



Spiral Steps to Traditional Health Risk Assessment (HRA)



Trends and development from environmental health risk to health impacts assessments (HIA)



Climate change and human health

RISKS AND RESPONSES

Editors

A.J. McMichael
The Australian National University, Canberra, Australia

D.H. Campbell-Lendrum
London School of Hygiene and Tropical Medicine, London, United Kingdom

C.F. Corvalán
World Health Organization, Geneva, Switzerland

K.L. Ebi
World Health Organization Regional Office for Europe, European Centre for Environment and Health, Rome, Italy

A.K. Githeko
Kenya Medical Research Institute, Kisumu, Kenya

J.D. Scheraga
US Environmental Protection Agency, Washington, DC, USA

A. Woodward
University of Otago, Wellington, New Zealand

WORLD HEALTH ORGANIZATION
GENEVA
2003

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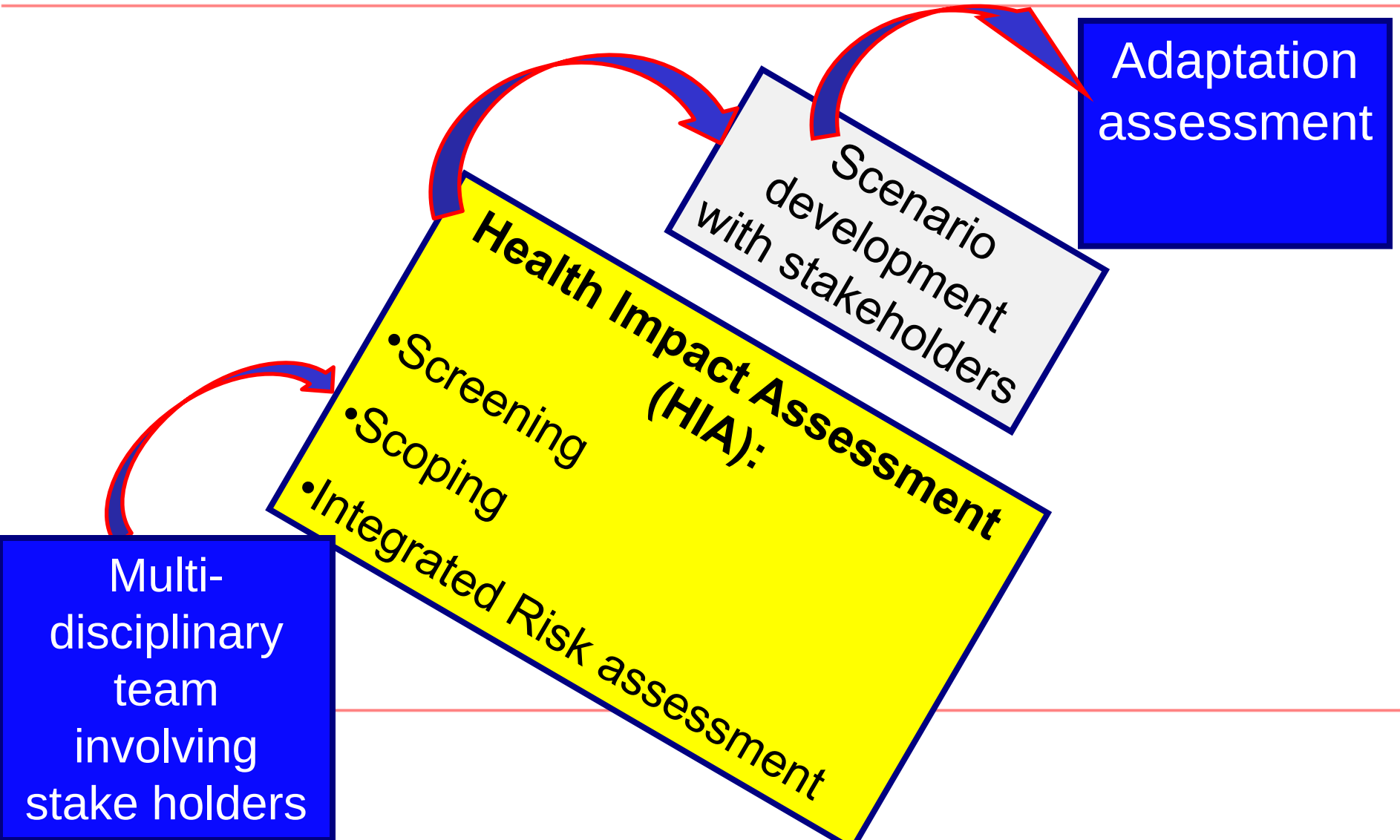
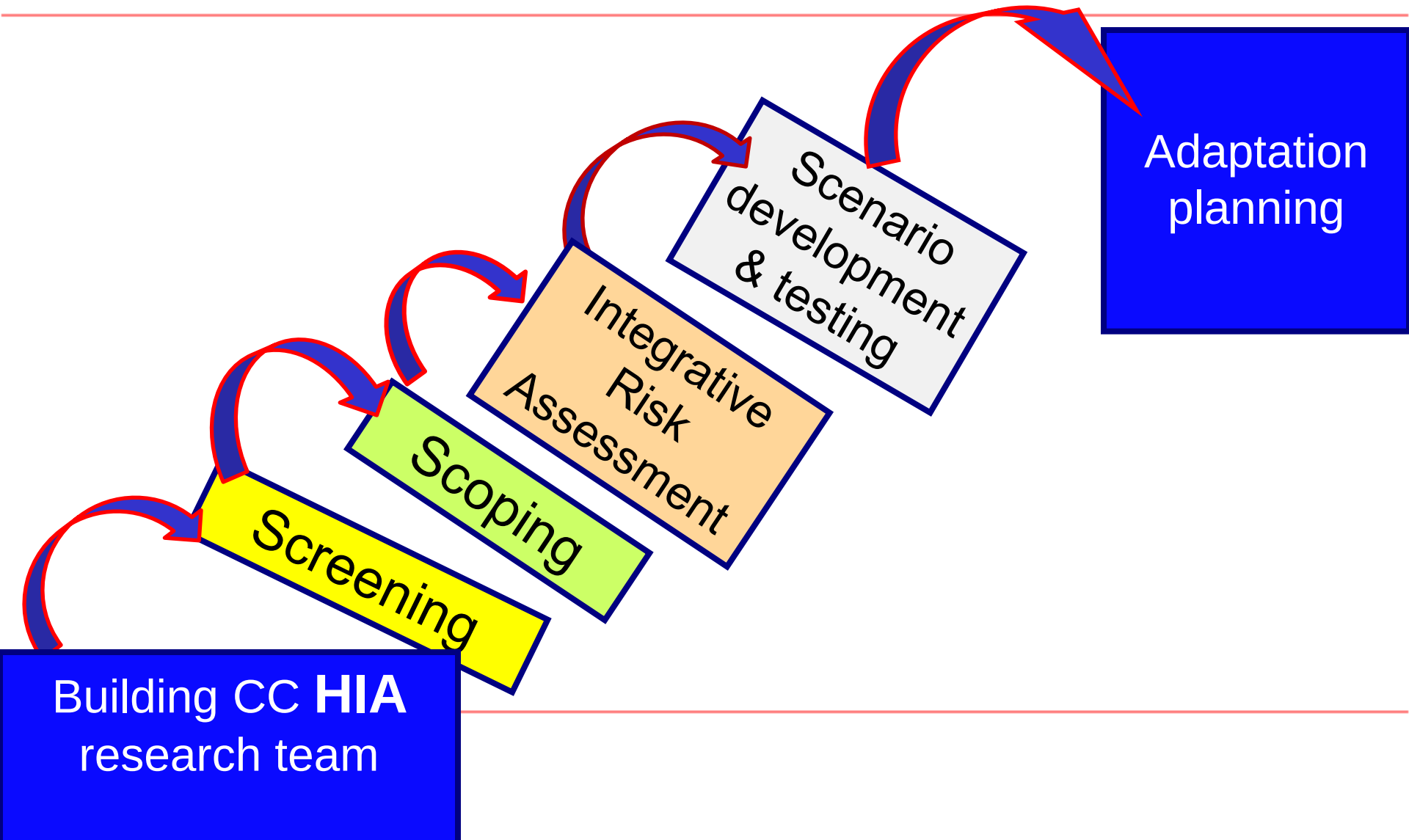
Spiral Steps to WHO CC Response: from HIA to integrative adaptation planning



Spiral Steps to climate change health adaptation research



Similar processes in different labels: Climate change language and health language

Climate Change terminology	Standard environmental health/other health discipline terminology
Vulnerability assessment Risk assessment	Health risk assessment Health impact assessment
Climate change adaptation	Risk management
Adaptive capacity	Coping capacity

Terms, methods, and issues in the health fields in dealing with climate change adaptation research

From HRA to HIA

Introduction to HRA

Introduction to HIA

Comparison of HRA and HIA

Role of Risk Assessment

*"To provide **complete information** to risk managers, specifically policymakers and regulators, so that the best possible **decisions** are made"*

(Paustenbach, 1989)

How does HRA fit into the decision making process?

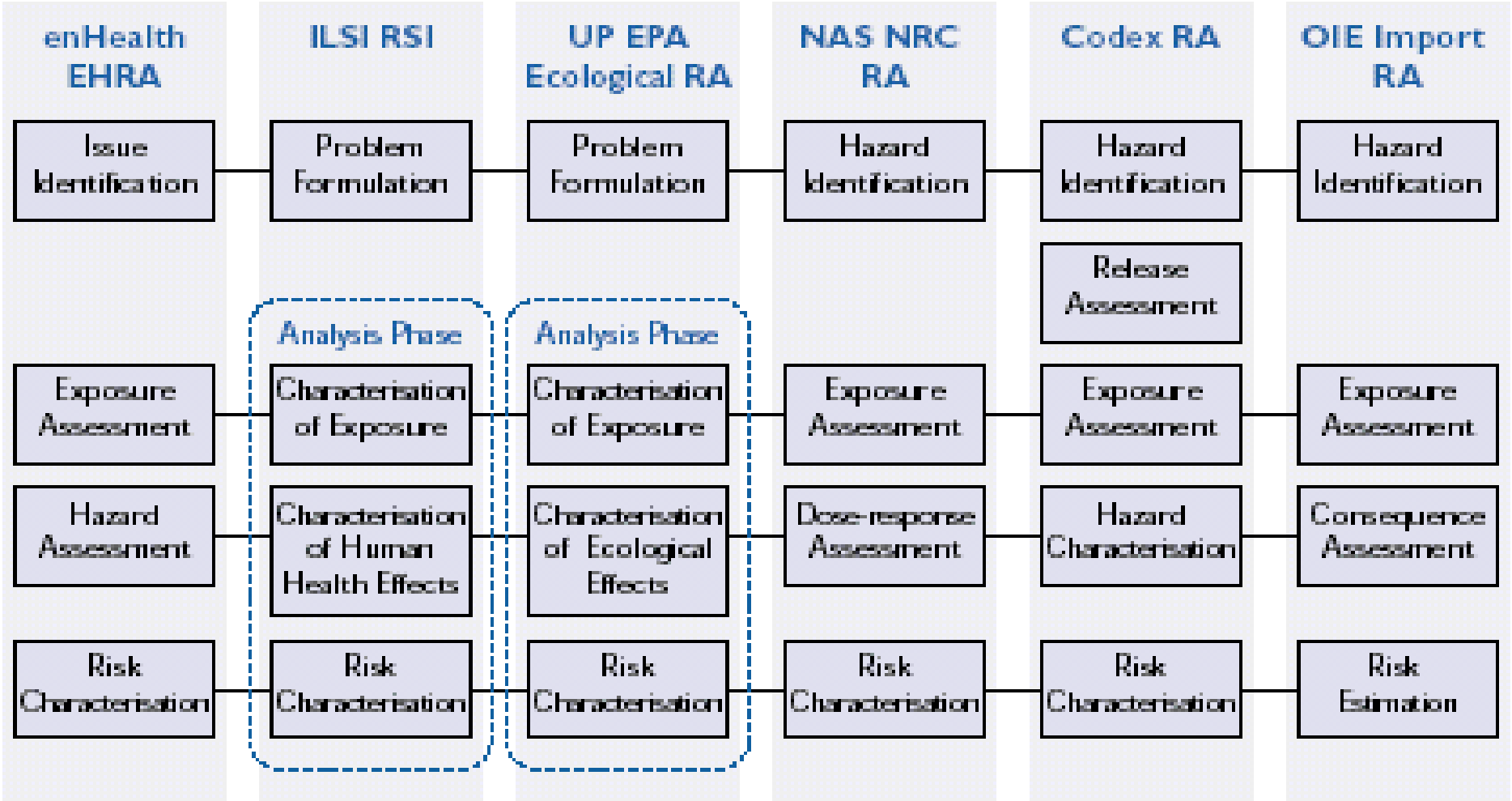
Risk Assessment

- science

Risk Management

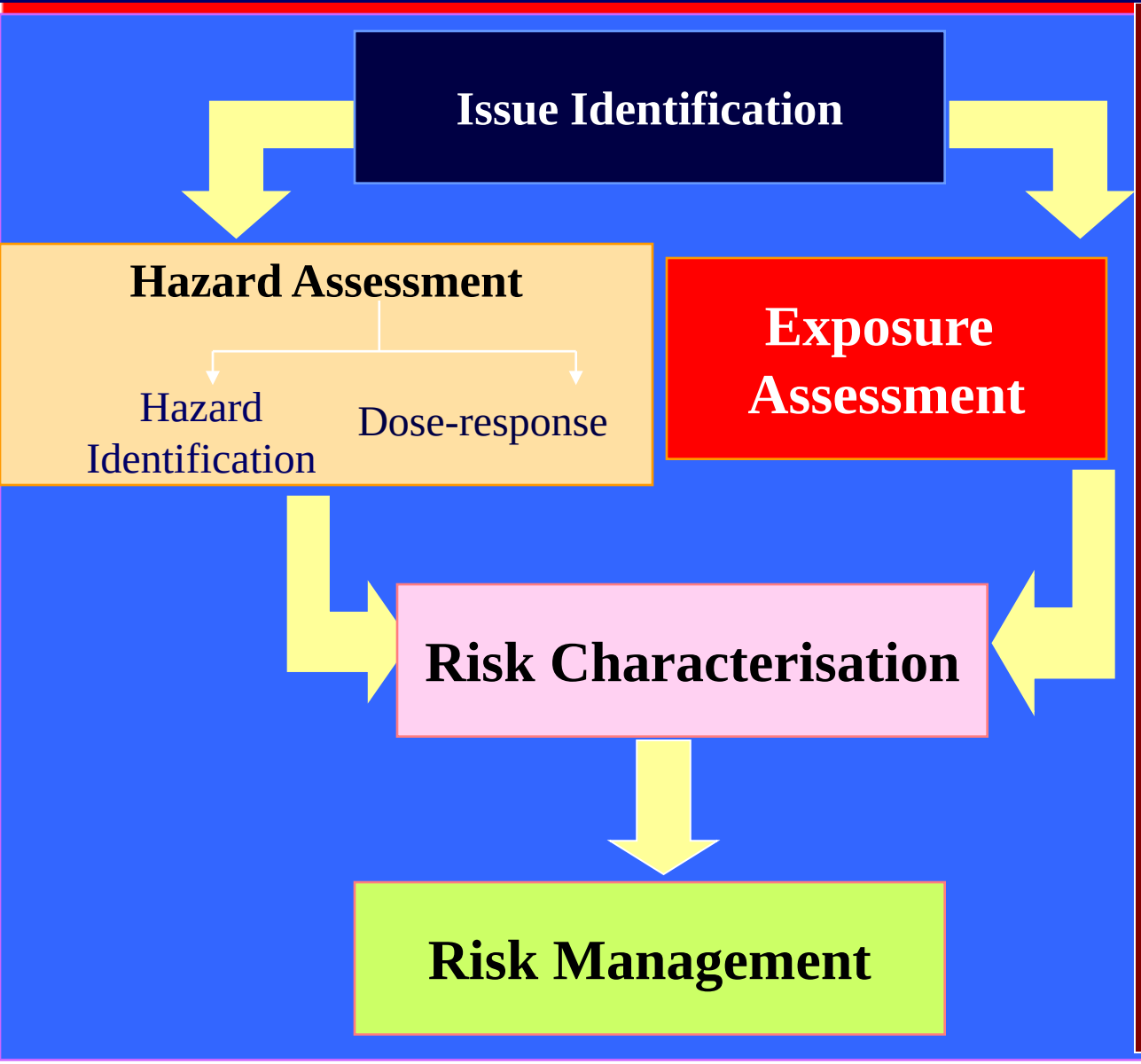
- politics
- economics
- public perception
- technology

Risk assessments: different frameworks, similar processes



(adapted from ILSI 1996 with permission)

Application of Environmental Health Risk Assessment Model to climate change and health – assessment and adaptation



Features:

-systematic and logical step-wise approach

-Increasing emphasis on stakeholder engageme

-Explicit consideration of uncertainties

-Can use qualitative and quantitative methods

Usually limited to:
-Single physical hazards (eg. Chemicals, biologica

From HRA to HIA

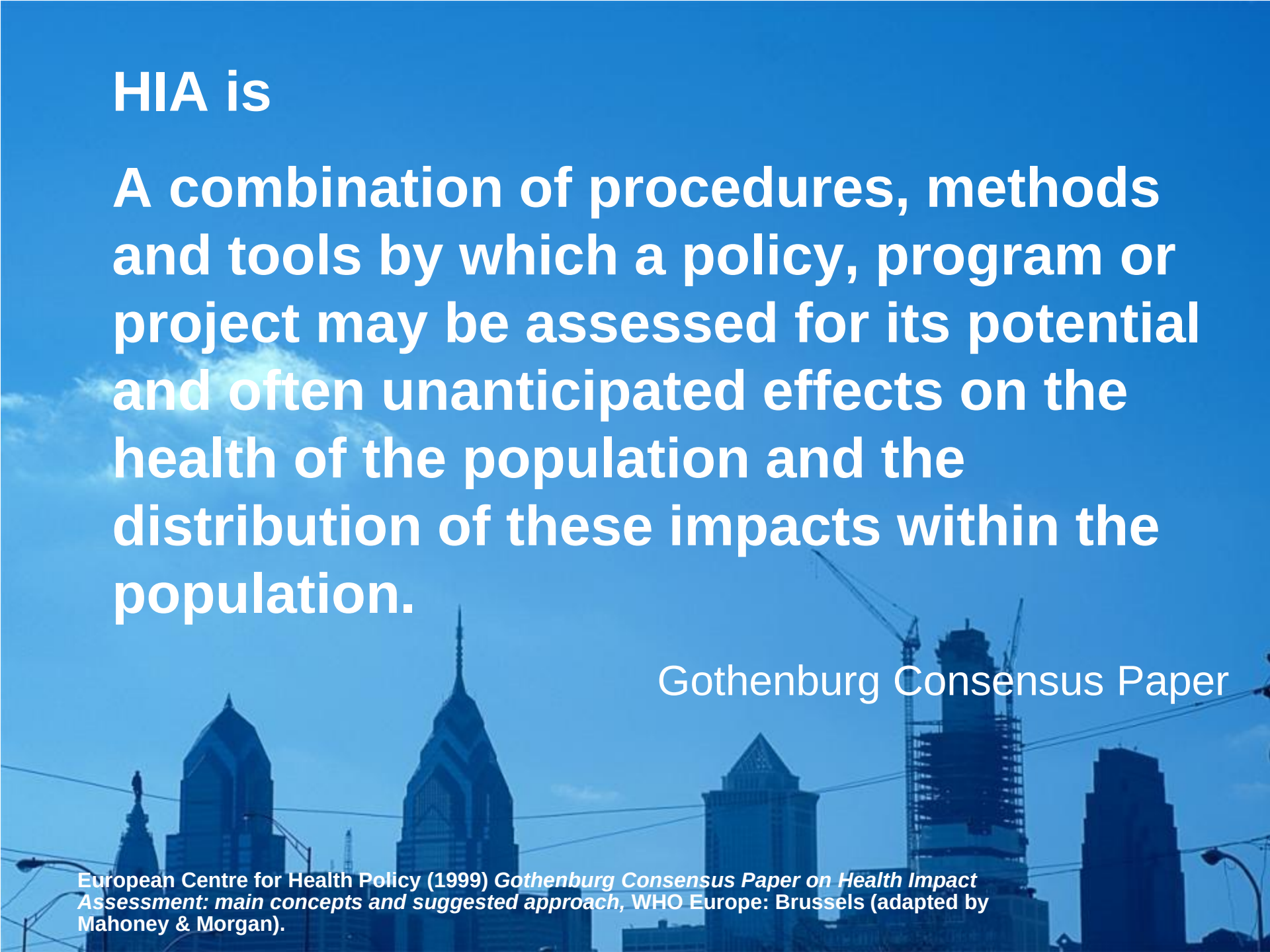
Health Impact Assessment

- **Includes social dimensions** not usually included in HRA
- Systematic, logical and transparent approach
- Facilitates the assessment of the distribution of impacts within a population – **considers inequality**
- Considers **interactions between physical, social, biological, political dimensions**
- Has a strong emphasis on **stakeholders** and **community engagement**

HIA is

A combination of procedures, methods and tools by which a policy, program or project may be assessed for its potential and often unanticipated effects on the health of the population and the distribution of these impacts within the population.

Gothenburg Consensus Paper



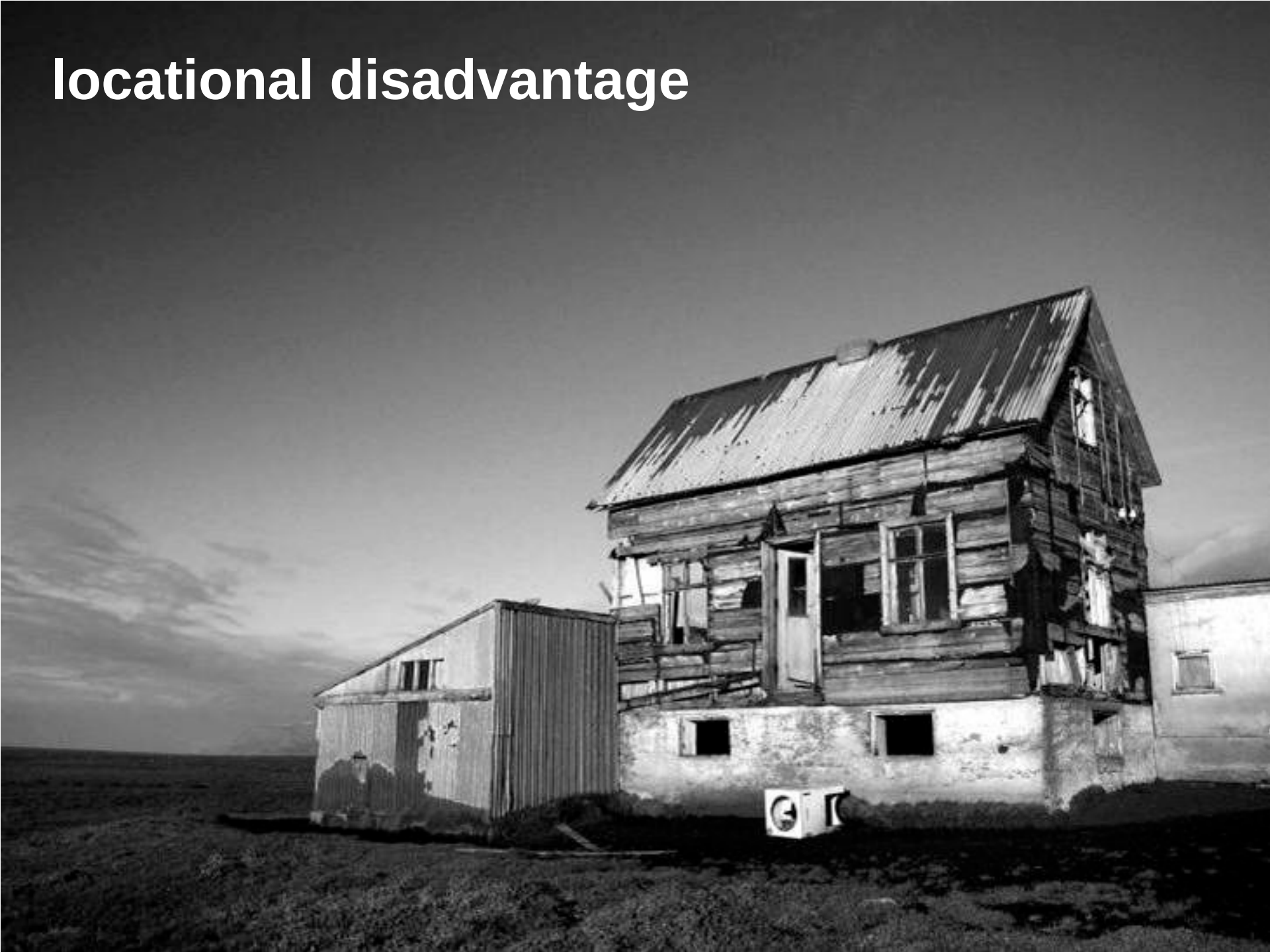
European Centre for Health Policy (1999) *Gothenburg Consensus Paper on Health Impact Assessment: main concepts and suggested approach,* WHO Europe: Brussels (adapted by Mahoney & Morgan).

Distribution of Impacts

Image: The Rocketeer

socioeconomic position

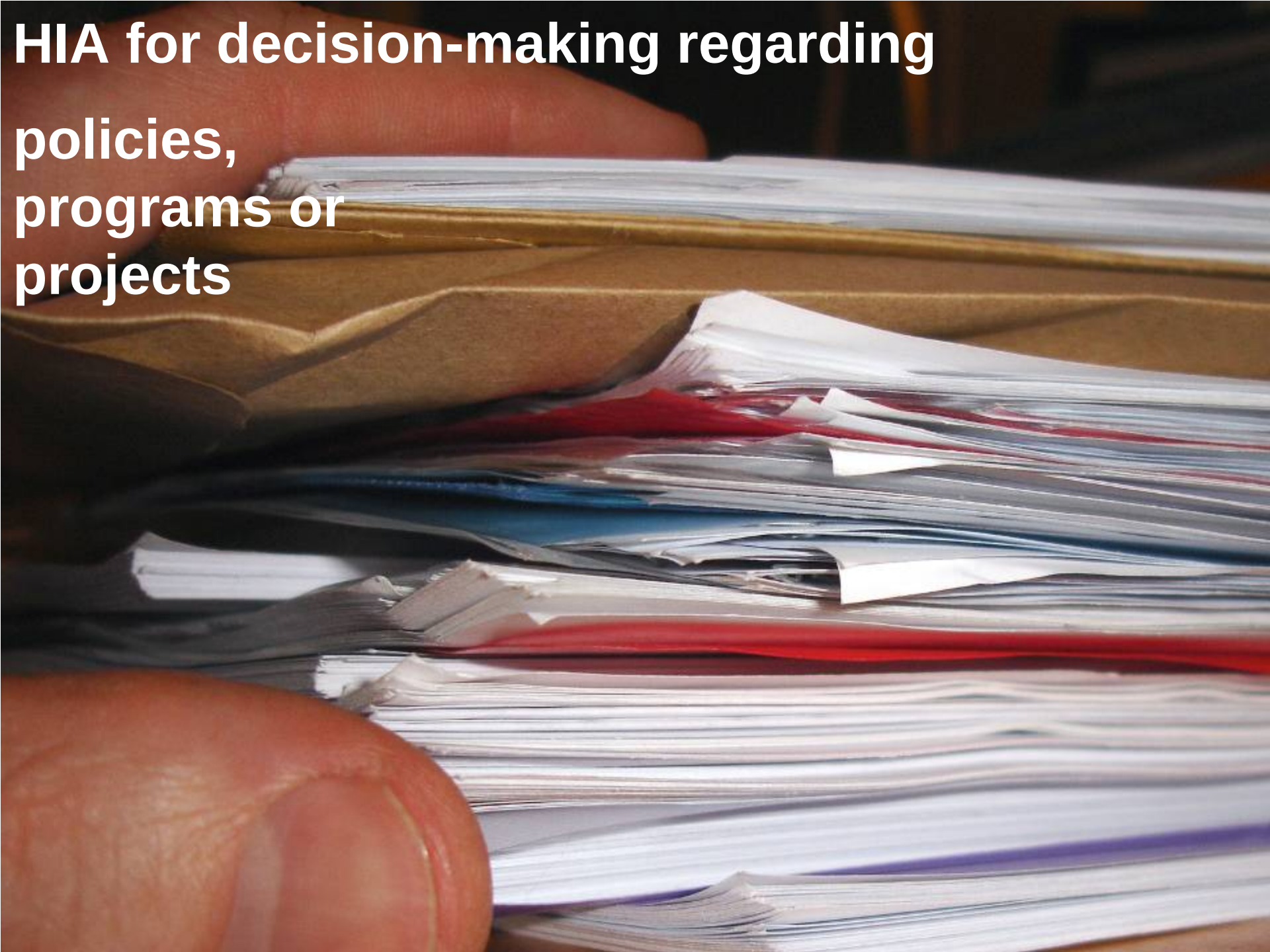
locational disadvantage



Ethnicity & culture

HIA for decision-making regarding

policies, programs or projects



Evolution in HIA to climate change assessment

From impact assessment → adaptation planning

Impact Assessment

Focus on identifying health Impacts and vulnerabilities

Adaptation planning

Need for integration of understanding of **health impacts** and **vulnerabilities** into adaptation (risk management) strategy development

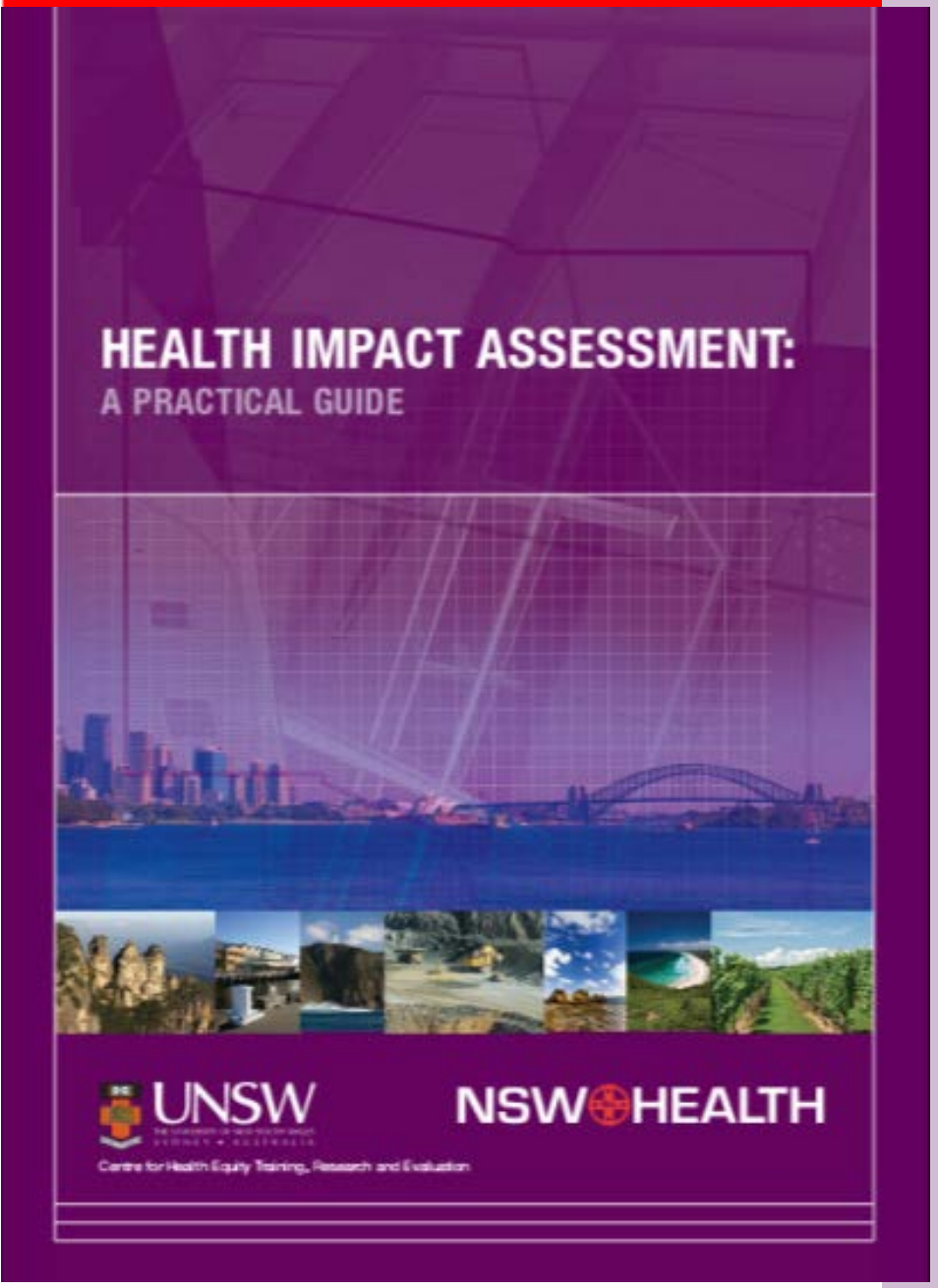
*This shift mirrors the changing paradigm in **traditional health risk assessment**
Which now requires greater inclusion of
risk management into the overall assessment process

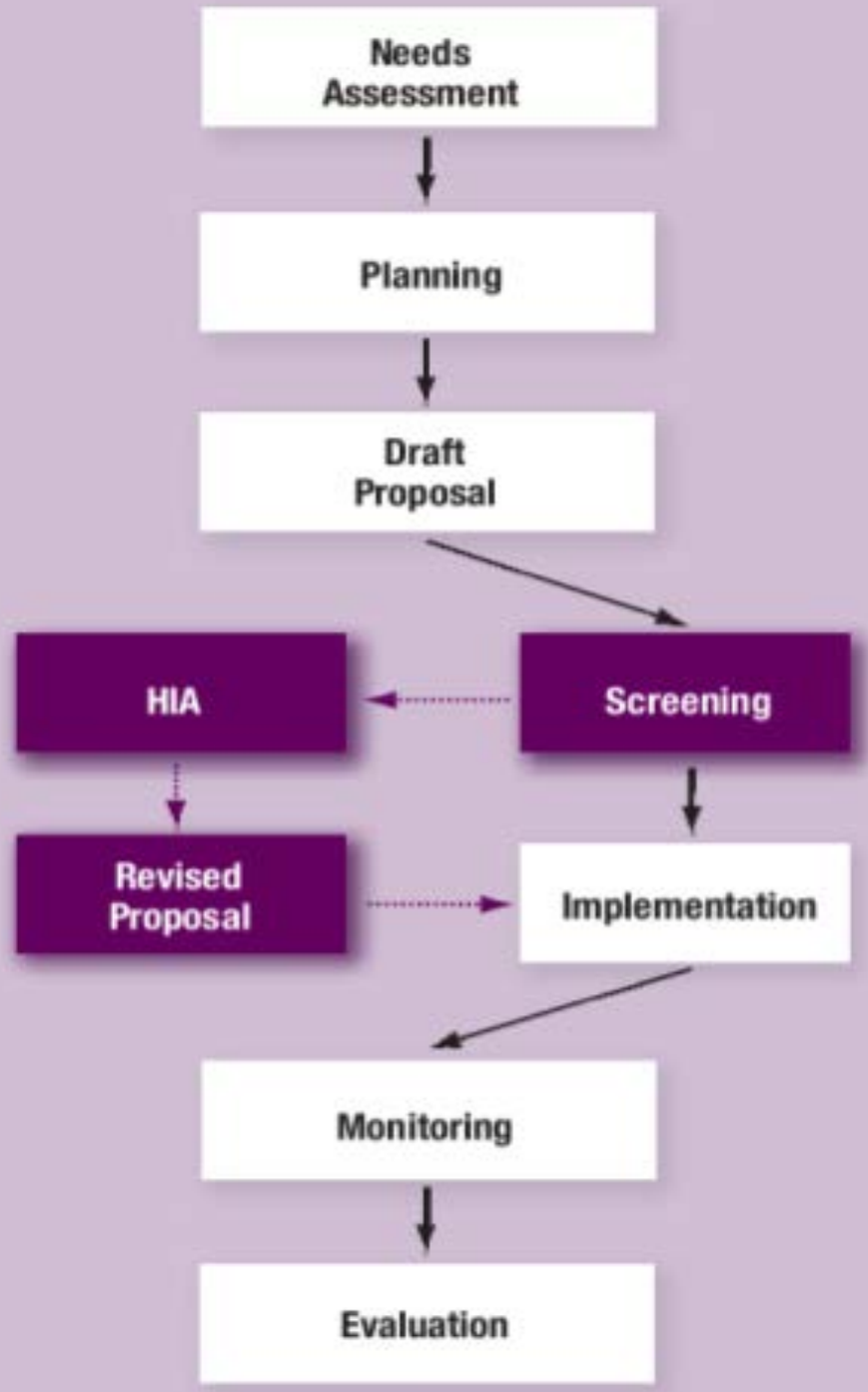
HIA Key steps

Lots of different models, but essentially same steps:

- **Screening**
- **Scoping**
- **Identification**
- **Integrative Appraisal/Assessment**
- **Decision-making and recommendations**
- **Monitoring and evaluation**

-Lots of different tools and guides available to assist with each step


HEALTH IMPACT ASSESSMENT:
A PRACTICAL GUIDE
UNSW
NSW HEALTH
Centre for Health Equity Training, Research and Evaluation


Needs Assessment
Planning
Draft Proposal
HIA
Screening
Revised Proposal
Implementation
Monitoring
Evaluation

Steps of HIA Model

	PURPOSE	TASK
SCREENING	Determine whether HIA is appropriate and required	• Pre-screening tasks • Conduct a screening meeting • Make screening recommendations
SCOPING	Set out the parameters of the HIA	• Set up a steering committee • Choose the appropriate level of depth of HIA that needs to be undertaken • Set the scope of gathering the evidence • Design a project plan
IDENTIFICATION	Develop a community / population profile and collect information to identify potential health impacts	• Develop a community/population profile • Collect primary and secondary, qualitative and quantitative information
ASSESSMENT	Synthesise and critically assess the information in order to prioritise health impacts.	• Assess the information on the impacts collected from the different sources. • Deliberate on the impacts to assess their significance and prioritise them
DECISION MAKING & RECOMMENDATIONS	Make decisions to reach a set of final recommendations for acting on the HIA's findings	• Develop a draft set of concise and action-oriented recommendations • Write a final recommendations report for implementation and action
EVALUATION & & FOLLOW-UP	Evaluate the processes involved in the HIA and its impact, and follow up the HIA through monitoring and a health impact management plan	• Conduct process and impact evaluation • Set up monitoring the impacts • Develop a health impact management plan

Griffith UNIVERSITY

Assessment

Recommendations

If you implement the proposal

These will be the impacts

If you make these changes

These will be the gains

HIA functions to assist decision making and can influence policy

	HRA	HIA
Traditions	Env Health	EIA, SIA
Focus	**chemical, biological, physical hazards (sometimes mixtures)**	**Broader – environmental, social and other determinants of health** - Explicit focus on **inequalities/uneven** distribution of impacts
Application	Single agents : Standard setting, retrospective or prospective assessment of health risk	Prospectively carried out for a program, project, policy
Data collection	**Mainly quantitative data** – toxicological and epidemiological data	**Mixture of quantitative and qualitative data** collection
Assessment	**Usually quantitative – probabilities** through probability of risk may be qualitatively assigned	**Mainly qualitative with prioritization of impacts and recommendations for decision making**
Community participation	**limited**	**Important part of process**
Framework	Systematic, transparent	Systematic, transparent
Decision-making (risk management)	Informs decision-making, but often very separate	Through a set of recommendations as an outcome, aims to influence decision making

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The need for health impact assessment in China: Potential benefits for public health and steps forward

Liming Wu [a,b,*], Shannon Rutherford [b], Cordia Chu [b]

[a] Shanghai Municipal Center for Disease Control and Prevention, Shanghai 200336, China
[b] Center for Environment and Population Health, Griffith University, Nathan 4111, Australia

A comparison of Chinese EIA and PaOHCP and HIA

A comparison of Chinese EIA and PaOHCP and HIA

Items	Chinese EIA	Chinese PaOHCP	HIA
Assessment objectives	Policy (land planning and developing), program, and Project	Construction projects and programs	Any project, program, and policy
Steps	Screening	Screening	Screening
	Scoping	Scoping	Scoping
	Assessment	Assessment	Assessment
	Decision-making	Decision-making	Decision-making
	Mitigation	Recommendation	Recommendation
	Follow-up	Monitoring	Monitoring
Assessment methods	Quantitative	Quantitative	Mixed methods: quantitative and qualitative
Focus of effect of impact	Negative	Negative	Positive and negative
Target and breadth of assessment	General population and environment	Occupational groups	General population
Determinants considered			
Individual	-	-	√
Physical environmental (including chemical, physical, radioactive, and biological)	√	√	√
Social	-	-	√
Cultural	-	-	√
Accessibility of health services	-	-	√

Application of HIA to climate change and health – assessment and adaptation

- Screening – **Is HIA the most appropriate method?**
- Scoping – **project governance, who will be involved in the assessment, temporal and geographical scope, methods to use, resources**
- Identification and assessment/appraisal of health impacts – **community profile (vulnerability assessment), collection of information to identify the potential health impacts, method for analysing and prioritizing impacts, use of both qualitative and quantitative methods dependent on data availability**
- Risk Management/Decision making and recommendations- **Adaptation strategy development – recommendations must be practical, socially acceptable, consider the cost of implementation, consider the opportunity cost, Include preventative as well as curative measures, be prioritised: short, medium and long-term, Identify a lead agency or individual, identify the drivers and barriers to change**
- Monitoring and evaluation – **particularly important given the increasing and changing knowledge relating to environmental impacts and subsequent health changes**

Application of HIA to climate change and health – assessment and adaptation – Western Australia example

- Method : 2 step process
  - Step 1: Identification of health impacts, vulnerable groups and current coping/adaptive capacity
  - Step 2: Qualitative risk assessment + identification of risk management/adaptation measures
- Primarily qualitative methods using expert workshops and qualitative risk assessments, indicating next step would involved more quantitative assessment
- A simple, easy to follow application of the HIA method to assess and develop adaptation strategies for health which uses health terminology in the climate change and adaptation context

WA example

- Phase 1
  - **Identification of health impacts** – identification ‘health impact pathways’ for both extreme and gradual impacts METHOD: expert workshops with experts drawn from physical, built environment, social environment and food areas
  - **Identification of vulnerable groups** – regional, economic, social, infrastructure and services AND some specific target populations
  - **Identification of current coping/adaptive capacity** with consideration of existing: technology, services, projects and programs, legislation and regulation, surveillance and monitoring, warnings and alerts, research

WA example

- Phase 2
  - Qualitative risk assessment using Australian Standard for Risk Management
    - *Uses criteria for **consequence** and **likelihood** to assign a **risk priority level***
    - *Uses expert opinion panels*
  - Identification of appropriate risk management/adaptation measures
    - *Uses public health concept of primary, secondary and tertiary measures and applies these to the health impact pathways previously identified*
    - *Criteria for consideration included: relevance to Western Australia, current capacity, how adaptation could be implemented (eg new or modification of existing), identification of section involved in the development and implementation of measures*
    - *Measures considered included: legislative or regulatory, public education or communication, surveillance and monitoring, ecosystem intervention, infrastructure development, technology/engineering, medical intervention, research/further information*

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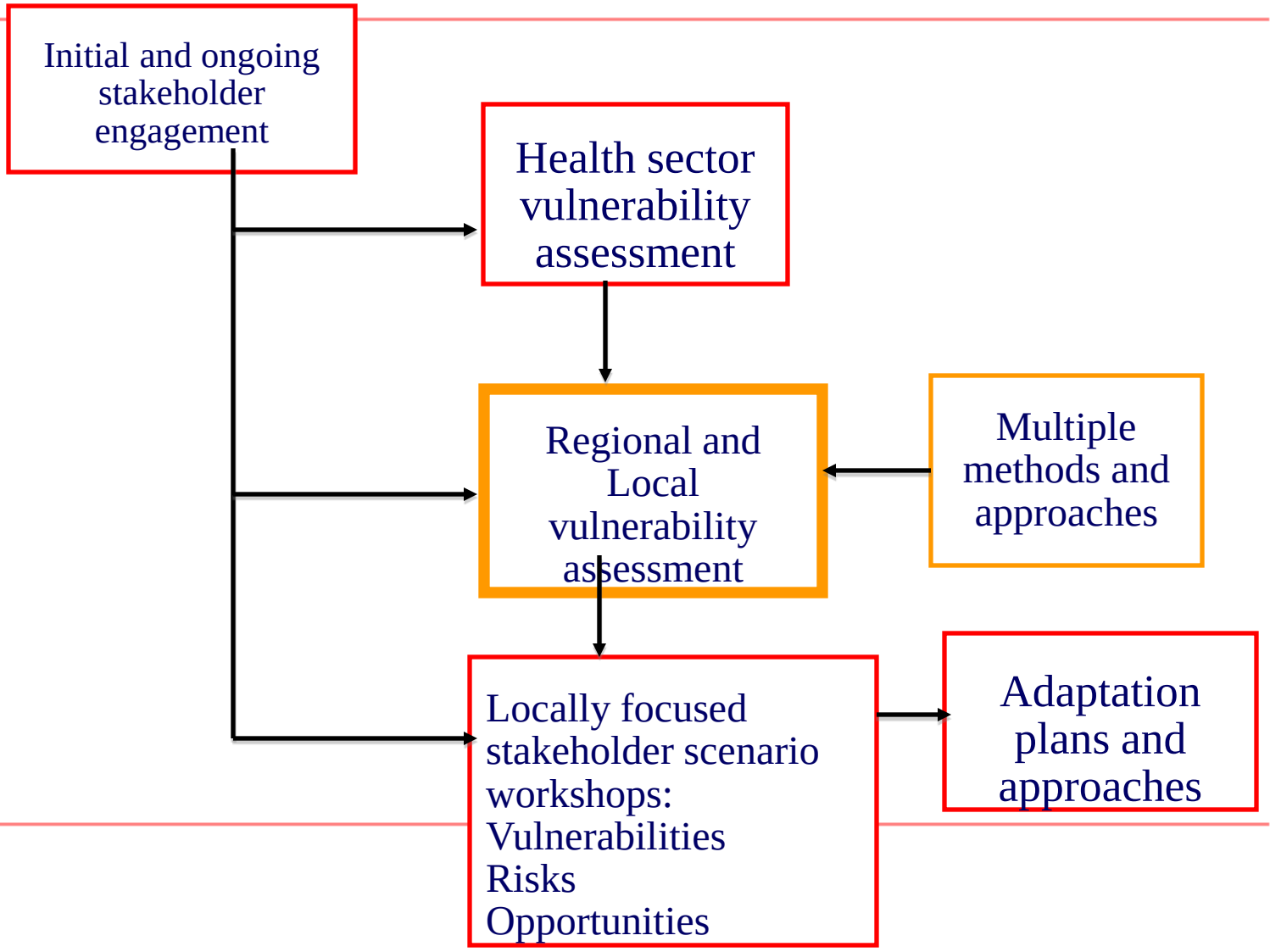
Integrated health assessment



Sector vulnerability

- Identified health sector or systems coping capacity
- How will a sector cope or be vulnerable to climate change

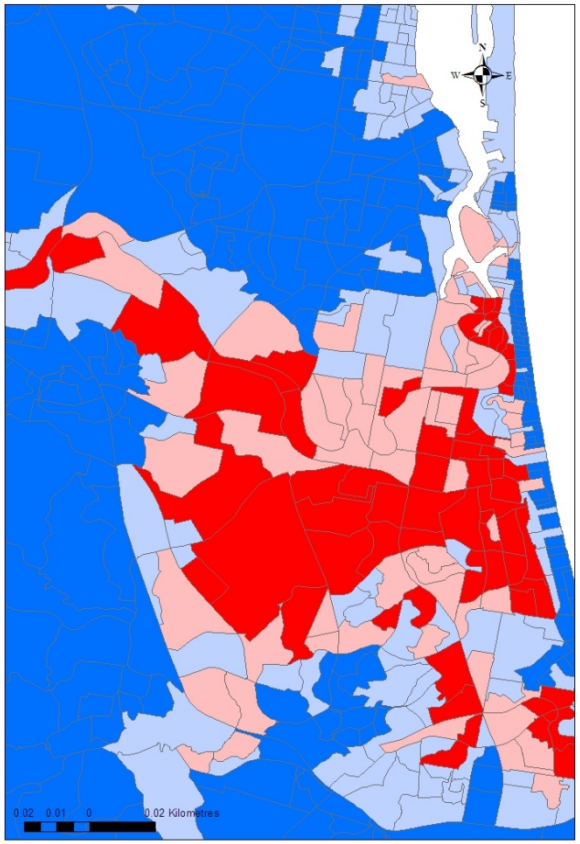
- i.e. for health what are the issues/challenges faced by the health sector in the face of climate change
    - *Patterns of disease*
    - *Workforce issues*
    - *Patterns of surveillance*

- Stakeholders important for information
- Epidemiological studies on potential disease patterns

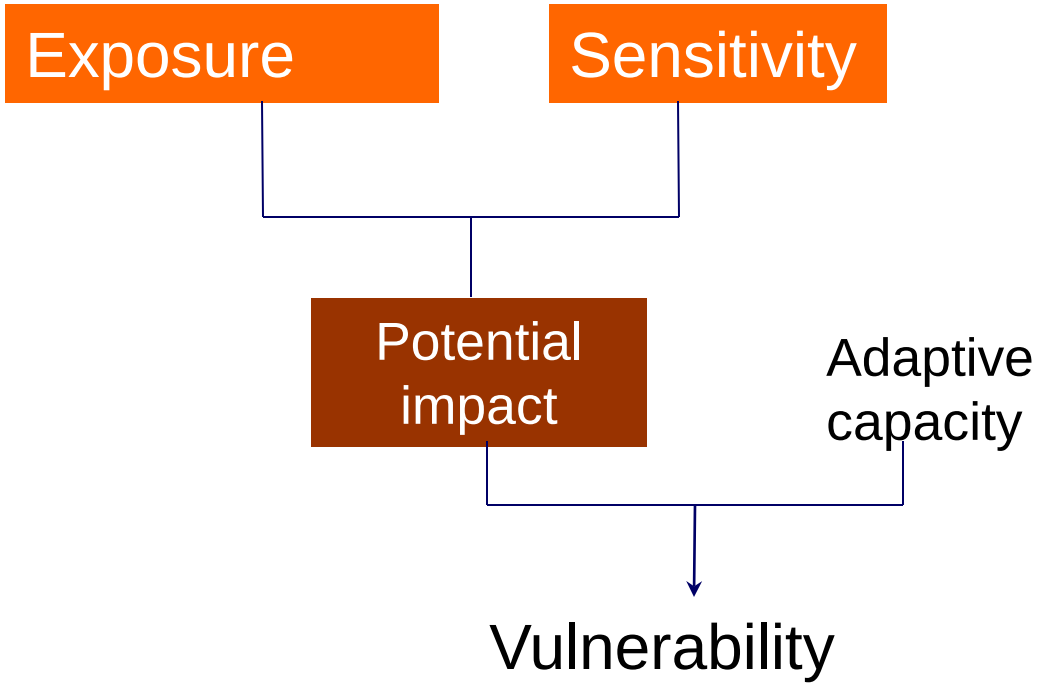
Regional and local health vulnerability assessment

- to identify ***who & what*** are vulnerable to ***what*** and help identify the reasons ***why*** they are vulnerable.
- What are the broad regional level issues
  - Climate issues
  - Health issues
- What are the local vulnerability issues
  - For health local level impacts important
  - Vulnerability will not be even

Local level VA



Local spatial vulnerability assessment



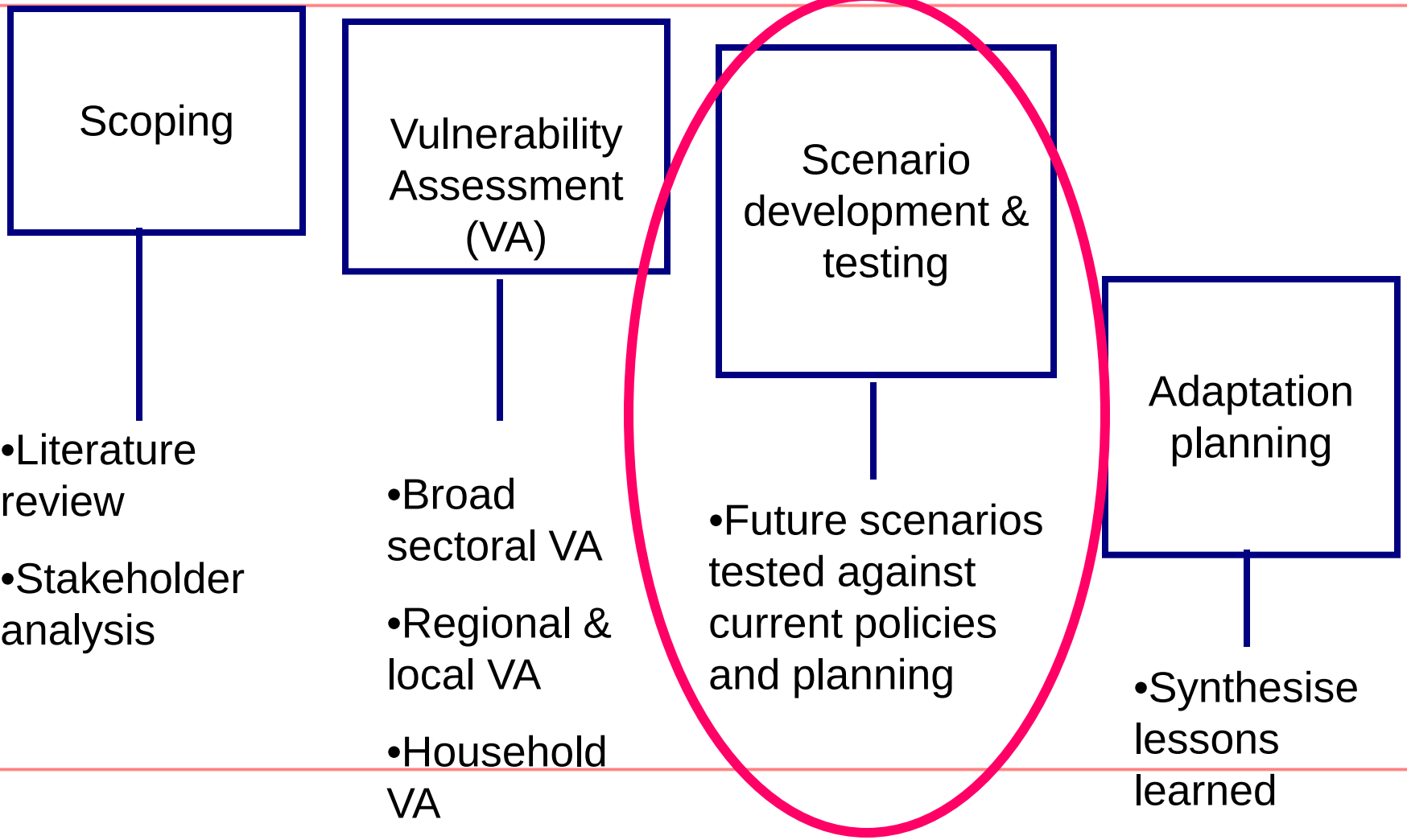
Local VA

- Local VA a combination of these factors (E, S, AC)
- May be some question in health about the separate nature of sensitivity and adaptive capacity
- Choice of indicators driven by existing literature, expert stakeholders etc

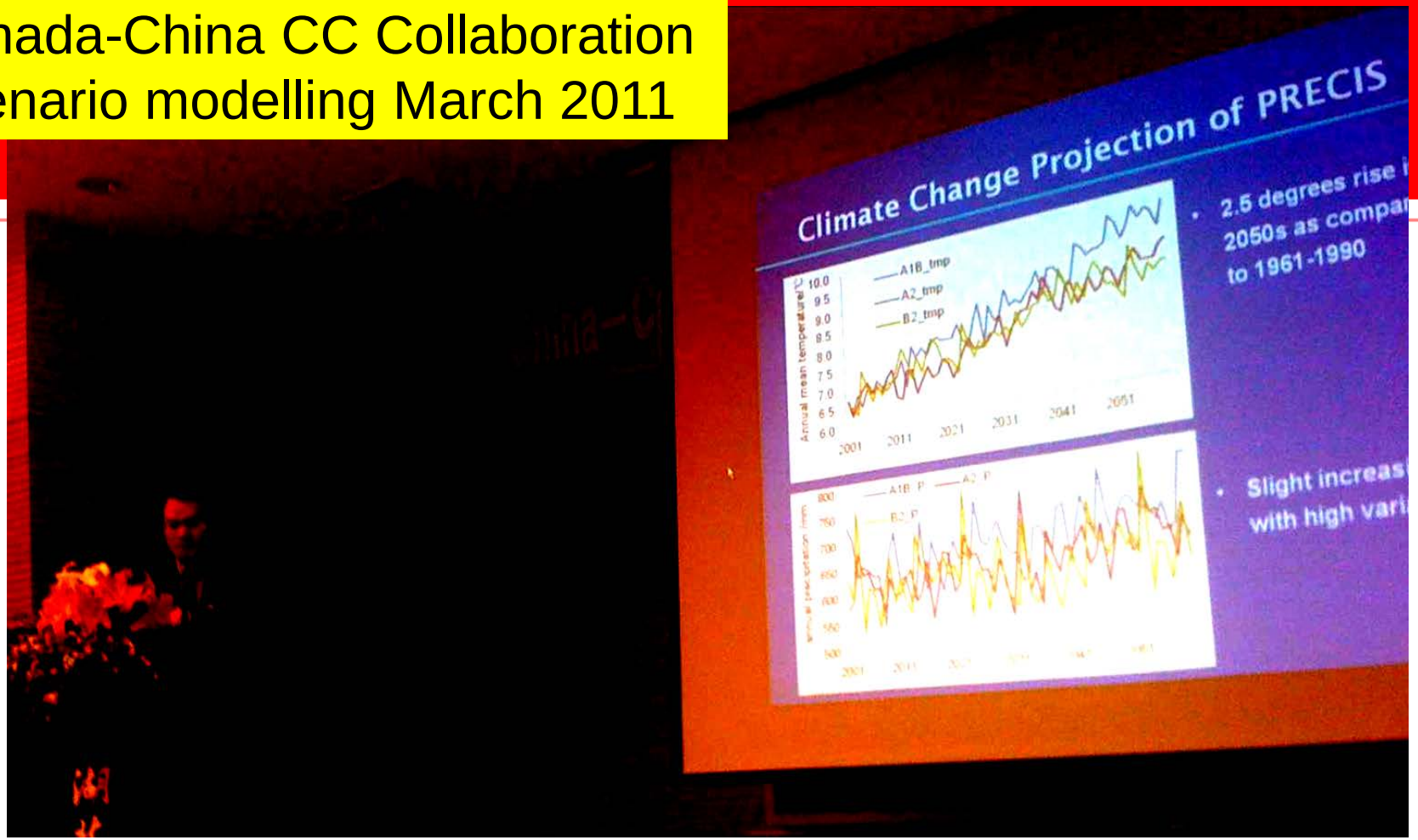
The individual variables for sensitivity and adaptive capacity are:

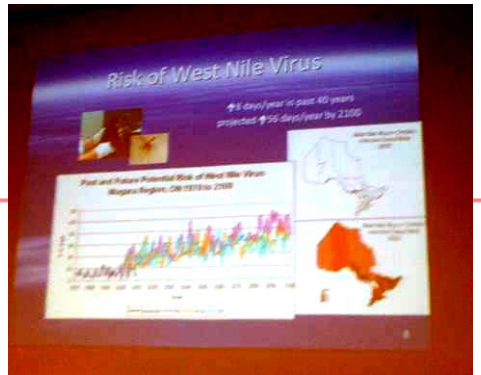
% of population older than 64 years of age
% of population who live alone
% of population less than 5 years of age
% population completing year 12
% households with internet access
Medium household income
Labour force participation rate
Average household size
% of single parent families
% of public housing
% of households who are outright owners
Unemployment rate
% of people who need assistance
% of people living at the same address as 1 year ago
% population doing voluntary work
% of people who are not Australian citizens
% of people born overseas
% of recent arrivals (arrived in Australia between 2001 and 2006)
% of people with poor English skills

Different conception about scenario Workshops for climate change adaptation



Canada-China CC Collaboration
Scenario modelling March 2011



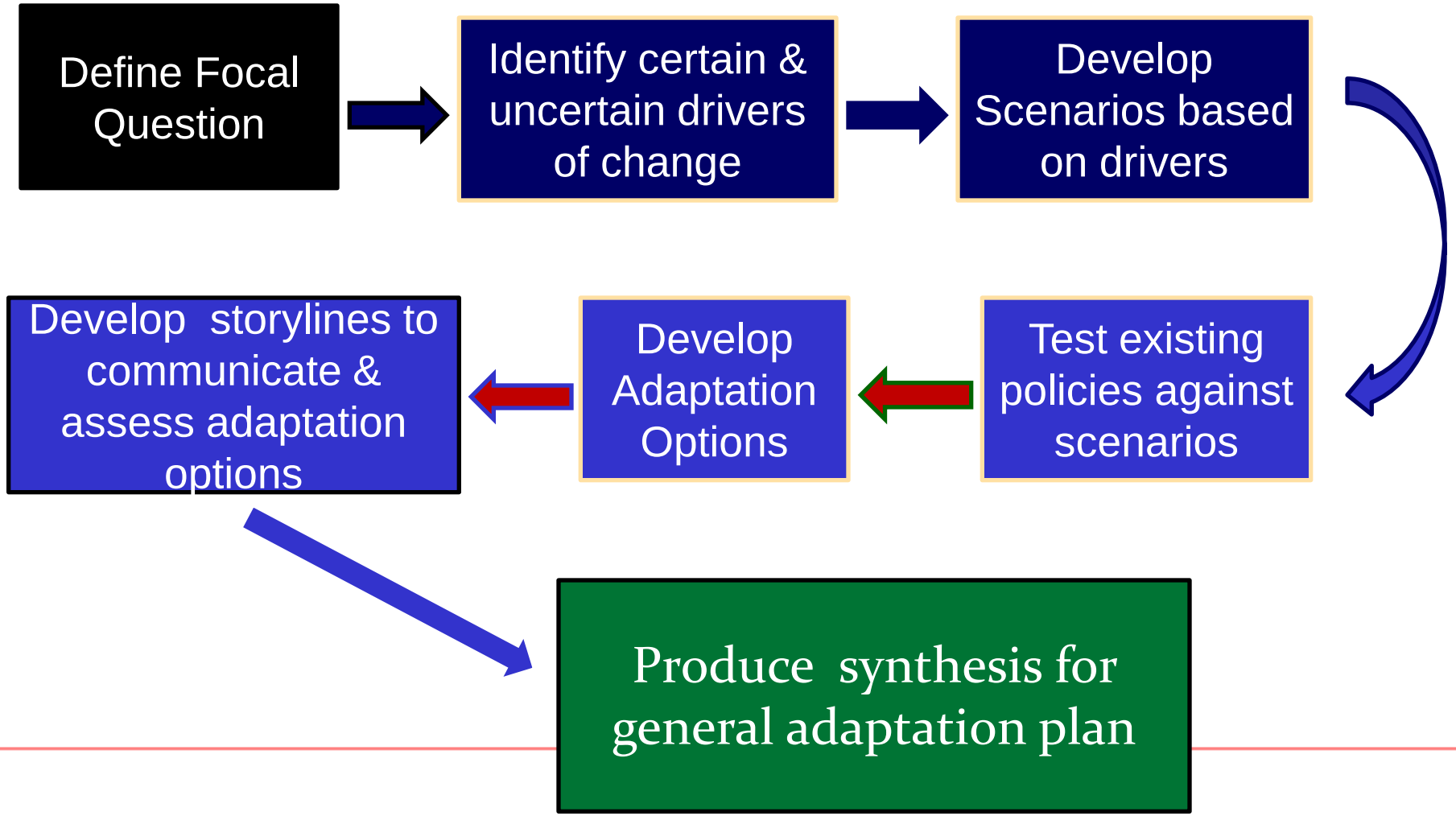


Scenario planning

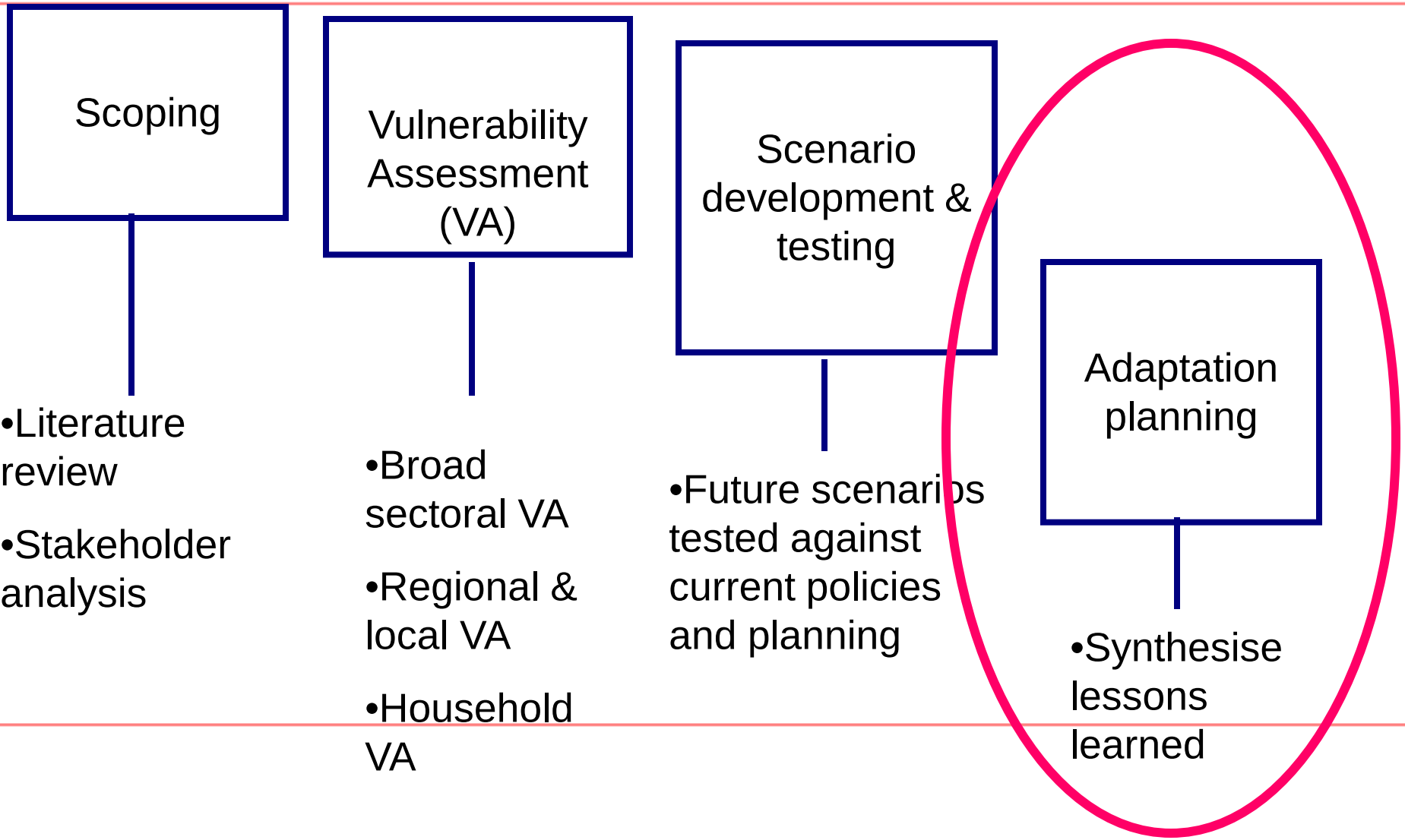
- **What is it?**
  - **Scenarios**: structured accounts of possible futures; **not predictions of a particular future**
  - **Scenario planning**: method for thinking creatively about possible complex and uncertain futures

- **Why use it for climate change adaptation?**
  - Most useful when high level of uncertainty
  - Creative, flexible way of preparing for uncertain future
  - Exploration of possible futures rather than a single predicted future
  - Provide framework for development & assessment of policies & strategies
  - Works best when participants are key decision makers

Scenario Planning Approach – Key Steps



From Scenario development to adatatopm planning



An interdisciplinary and integrative framework is necessary to bridge disciplines and facilitate climate change research collaborations towards:

- **Dealing with Uncertainty**
- **Improving data availability**
- **Addressing complexity –multiple** determinants with multiple pathways of causality and interactions between determinants
- **Enabling systematic assessment –** need for assessment tools that are logical and transparent and stepwise
- **Understanding and engaging existing community**
- **Influencing decision-making and policies**
- **Taking actions** –to meet the needs of users and to affect changes