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Overview on current and general Impact, Adaptation and Vulnerability (IAV) practices in the Philippine

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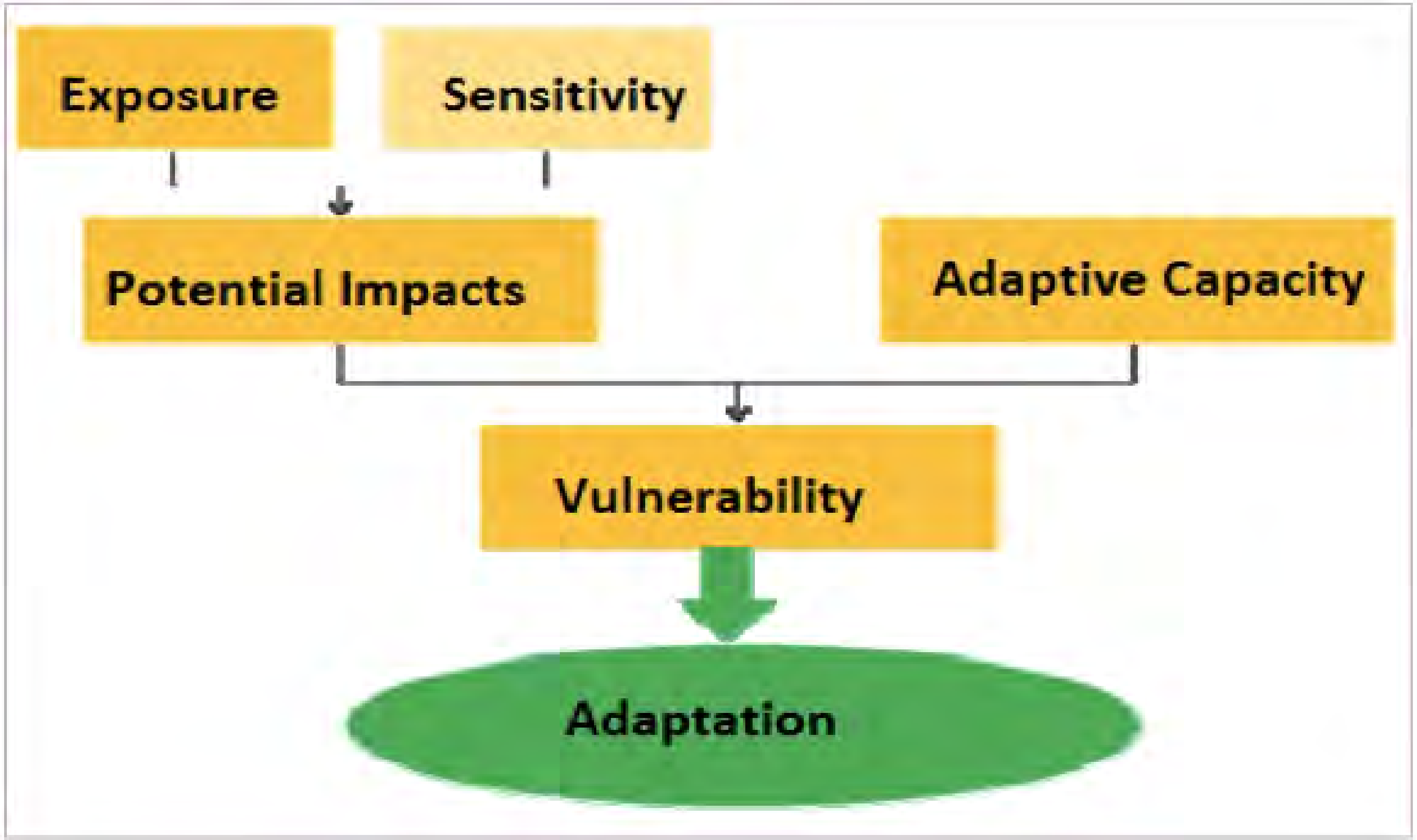
Now that we have climate projections… so what?

- Understanding climate variability and climate change is just one step towards adaptation.
- We also need to know HOW we may be affected by these changes in concrete terms, and WHY we are affected in these ways.
- Only then can we formulate effective ACTION plans.

Outline

- Two Conceptual Frameworks: Vulnerability and Risks
- Stakeholders Mapping
- Framing Adaptation
- A brief on the Philippine Case Study

Vulnerability Framework: as defined by IPCC



Vulnerability Assessment

- Central component of adaptation action.
- Help identify the nature and extent to which climate change may harm a country, region, sector or community.
- Provide a basis for devising measures that will minimize or avoid this harm – i.e. to adapt.
- Mechanisms for gathering information on "what **to adapt to and how to adapt"** (Füssel and Klein 2006).

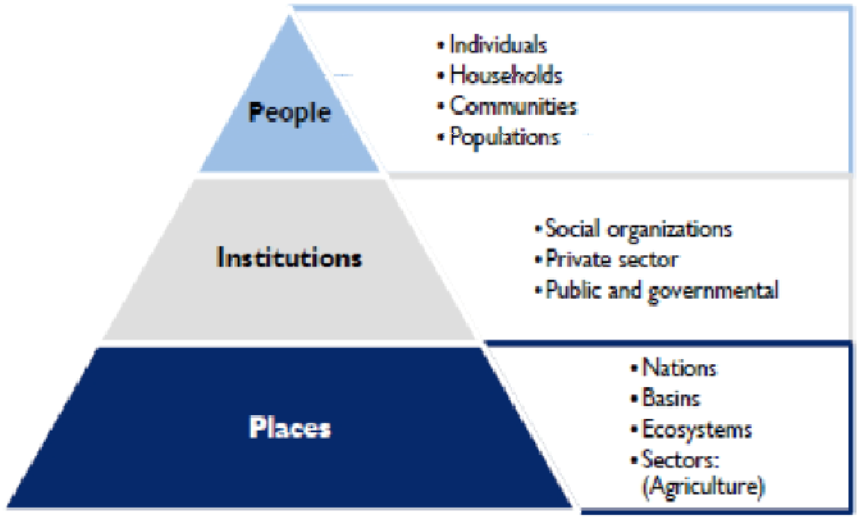
Vulnerability Assessment

It is critical to answer questions such as:

- Who (or what) is vulnerable → System
- To what are they vulnerable → Exposure
- Why are they vulnerable → Sensitivity
- What are available (or not) to lessen this vulnerability → Adaptive Capacity

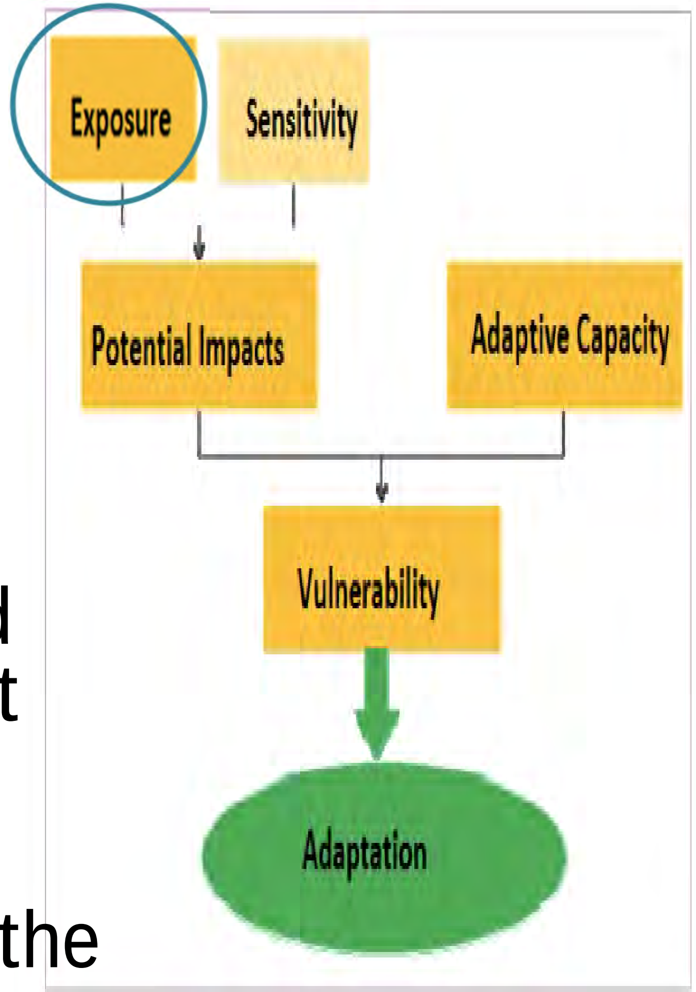
System of Interest

- The unit chosen to assess in respect to assessment questions
- Can be determined at different levels depending on the objective of the assessment
  - a single crop system,
  - an ecosystem,
  - a region



General units of analysis for vulnerability assessments

Exposure



- Defines the **system of interest**
- Includes an analysis and characterization of what **hazards** are present
- Details the **nature** and **degree** of coverage of the hazard

Hazard

- The *p*hysical manifestations of climatic variability or change, such as droughts, floods, storms, episodes of heavy rainfall, long-term changes in the mean values of climatic variables, potential future shifts in climatic regimes and so on.
- Climate hazards may be defined in terms of **absolute values** or **departures (change) from the mean of variables** such as rainfall, temperature, wind speed, or water level, perhaps combined with factors such as speed of onset, duration and spatial extent.

Broad Categories of Hazards

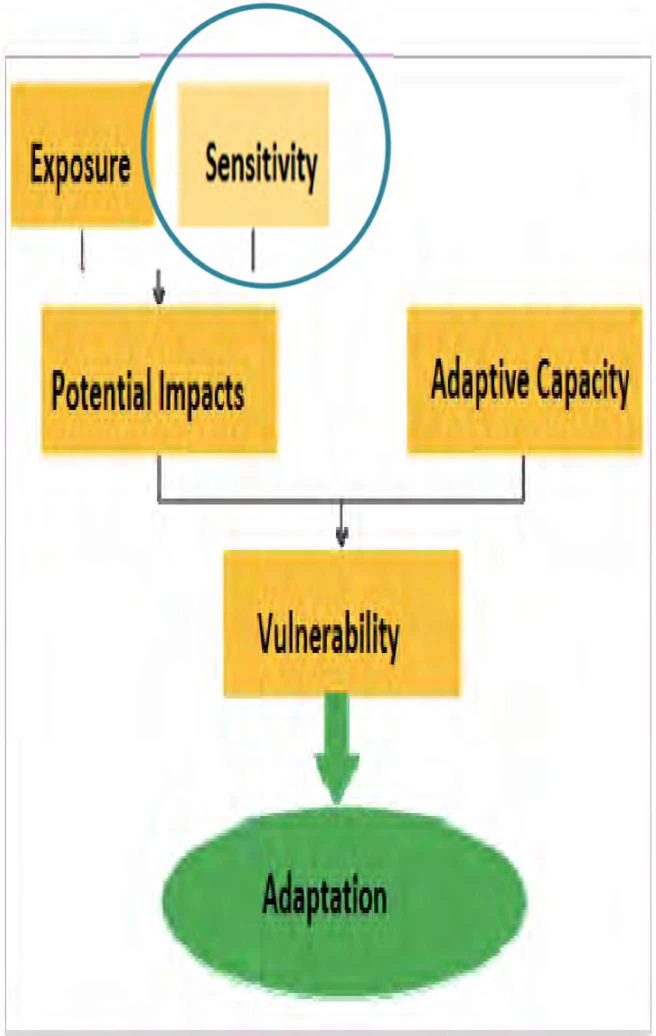
1. **Discrete recurrent hazards,** as in the case of transient phenomena such as storms, droughts and extreme rainfall events

2. **Continuous hazards,** for example increases in mean temperatures or decreases in mean rainfall occurring over many years or decades

3. **Discrete singular hazards**, for example shifts in climatic regimes associated with changes in ocean circulation; the palaeoclimatic record provides many examples of abrupt climate change events associated with the onset of new climatic conditions that prevailed for centuries or millennia e.g. ice age

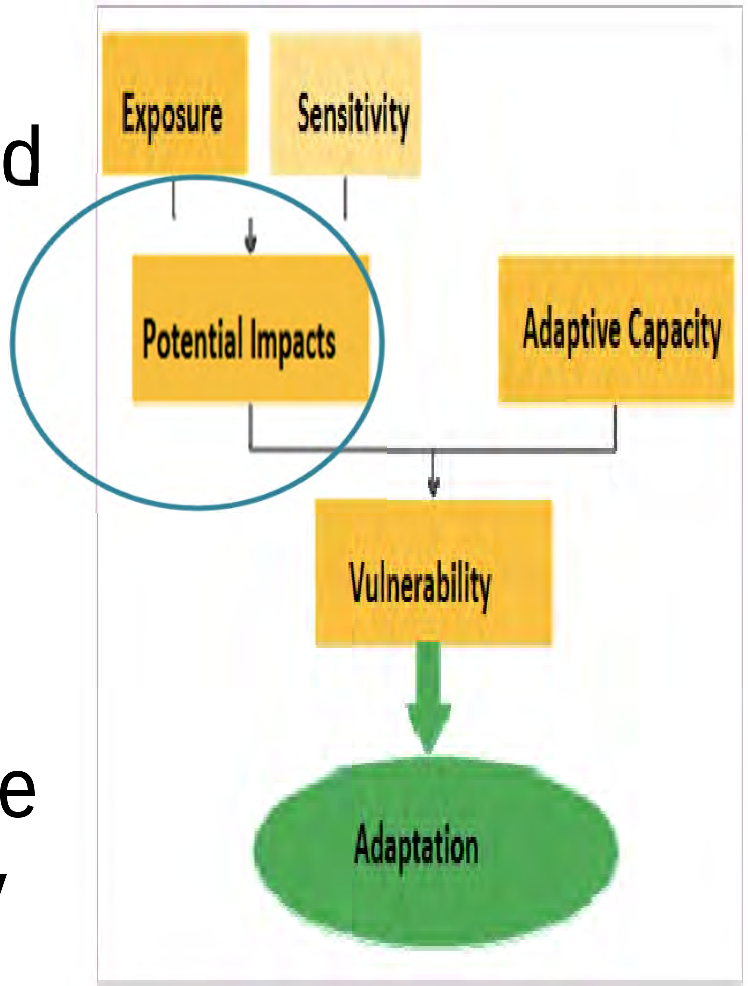
Sensitivity

- Includes responsiveness to both **problematic** and **beneficial** stimuli
- **vs. Susceptibility** - degree to which a system is open, liable, or sensitive to climate stimuli (similar to sensitivity, with some connotations toward damage)



Potential Impact

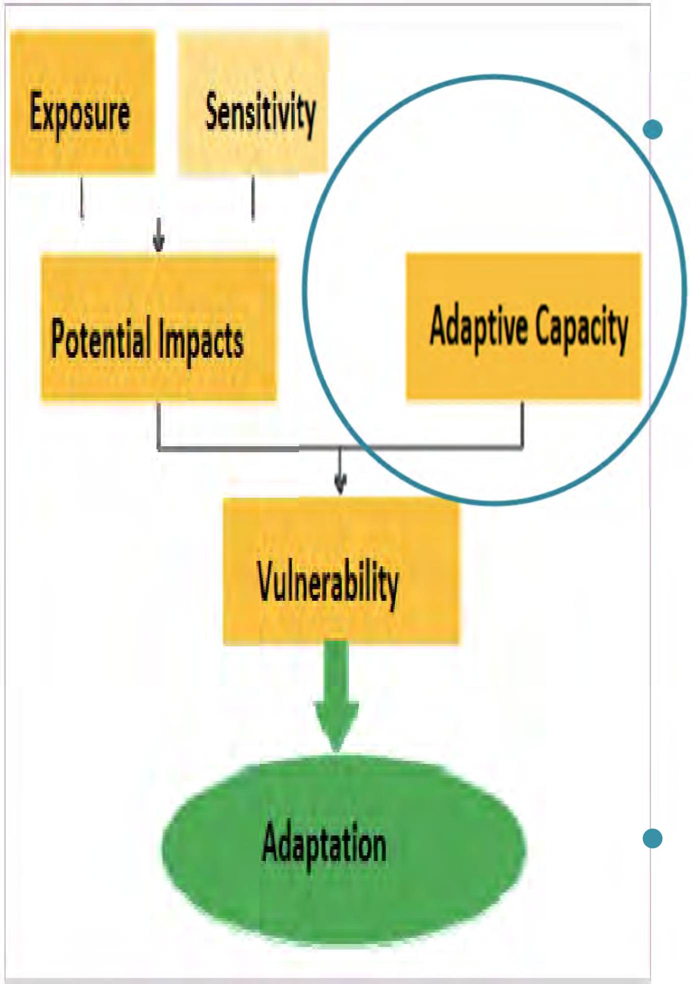
- Effects on natural and human systems of physical events, of disasters, and of climate change.
- Without adaptive capacity, impact is the same as vulnerability



Climate Change Impact

- Effects of climate change on natural and human systems.
  - Potential impacts: all impacts that may occur given a projected change in climate, without considering adaptation
  - Residual impacts: the impacts of climate change that would occur after adaptation
- Impact Assessment: The practice of identifying and evaluating, in monetary and/or non-monetary terms, the effects of climate change on natural and human systems

Adaptive capacity



- The combination of the strengths, attributes, and resources available to an individual, community, society, or organization that can be used to prepare for and undertake actions to reduce adverse impacts, moderate harm, or exploit beneficial opportunities.
- The ability to make adjustments

Adaptive Capacity

Determining factors

- Technological resources
- Human capital, social capital
- The structure of institutions
- Managerial abilities of decision makers,
- The availability and access to financial and informational resources, and
- The public's perception of climate change

Generic determinants

- Health
- income
- education

Specific determinants

- institutions
- knowledge
- technology

Source:(Brooks, 2003; Adger, et al, 2007))

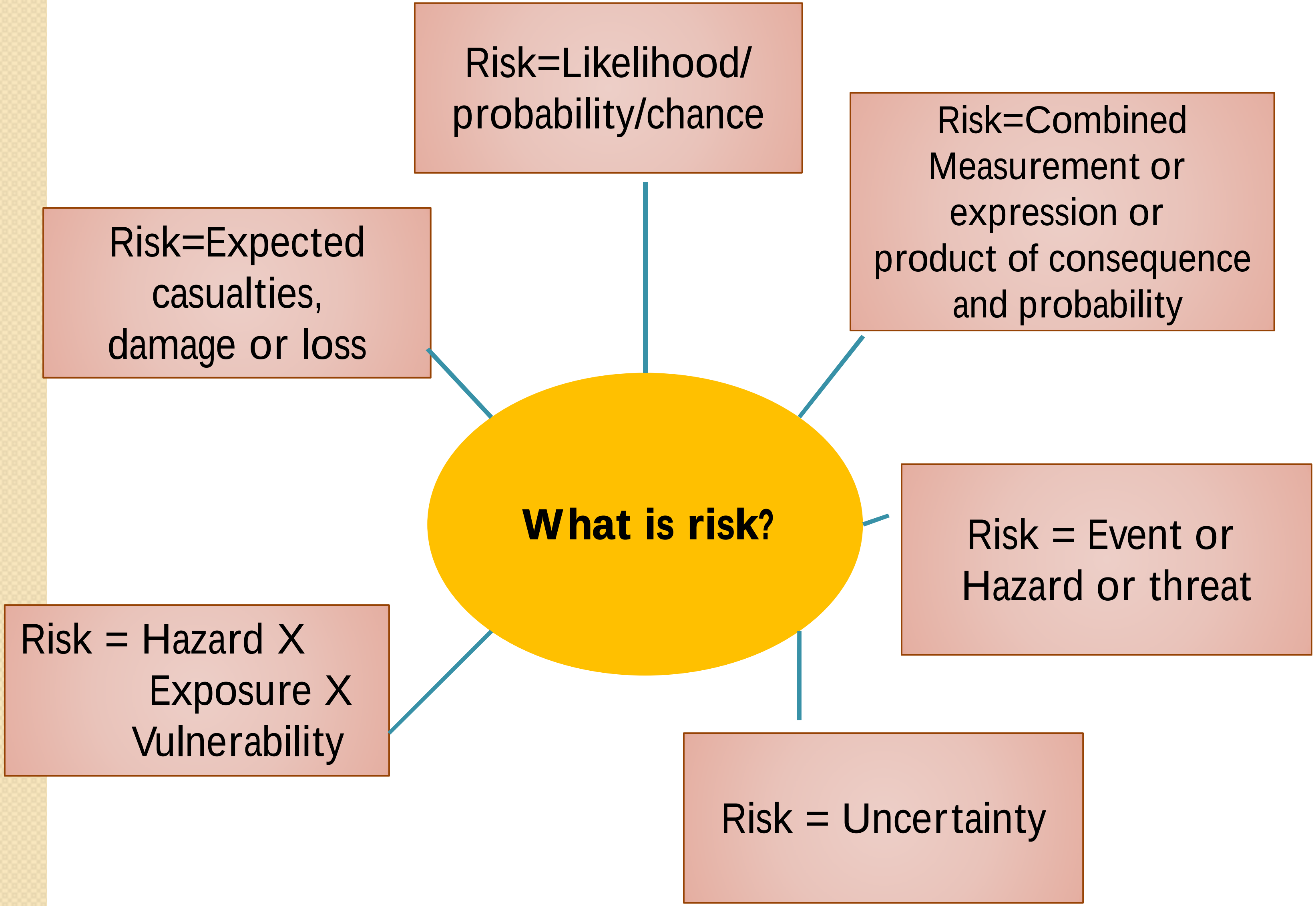
Vulnerability

- Vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes.
- Vulnerability is a function of the **character, magnitude, and rate of climate change** and **variability** to which **a system is exposed, its sensitivity, and its adaptive capacity**

Compendium of Climate Change Vulnerability and Impact Assessment Tools

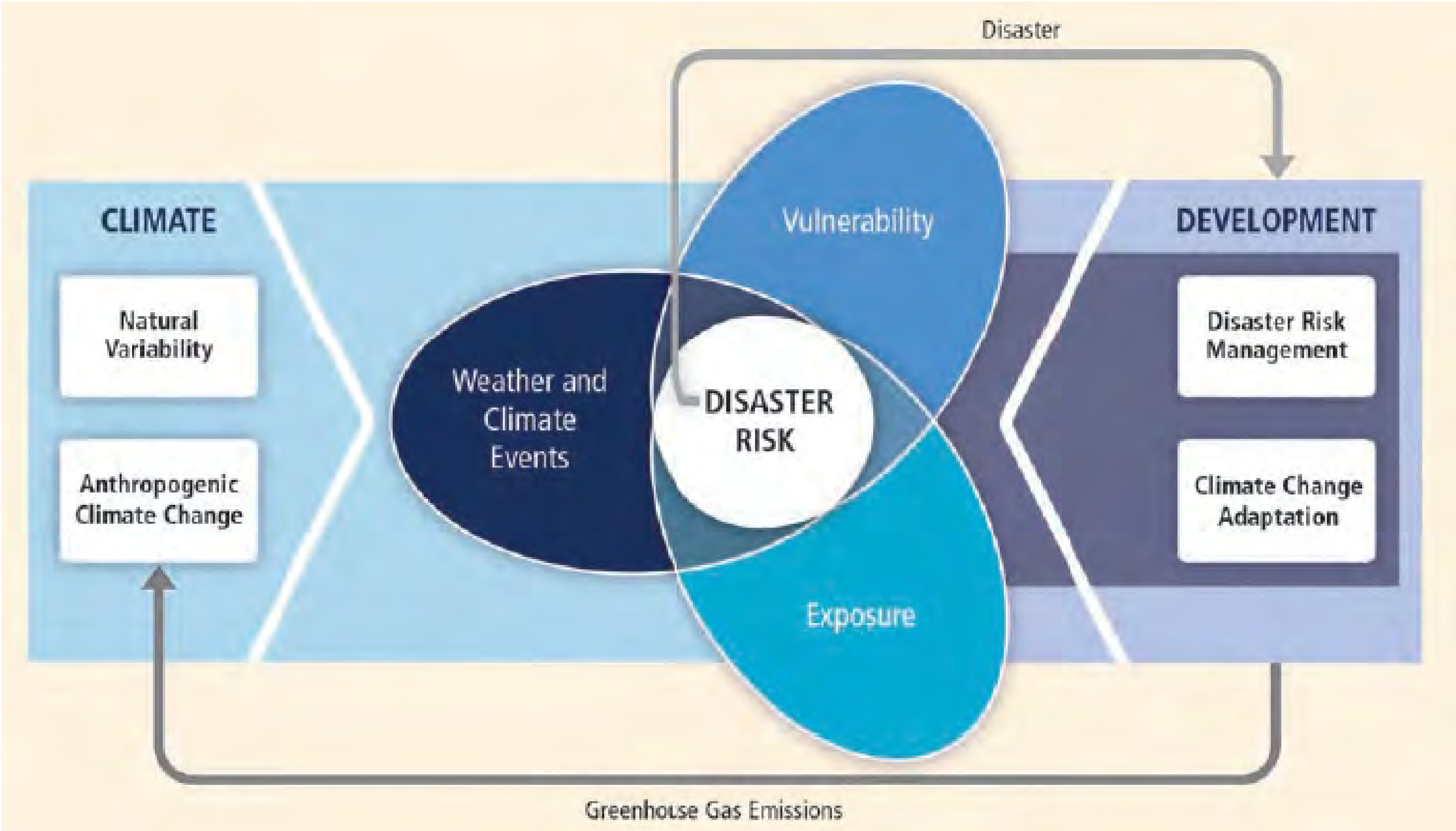
Climate Change Commission, 2013

Disaster Risk Framework: What is risk?



There is no single definition of risk. Economists, behavioral scientists, risk theorists, statisticians, and actuaries each have their own concept of risk.

Disaster Risk Framework



SREX, 2012

The Risk Management Framework

Risk Assessment

- What can go wrong?
- How bad are the effects if something does go wrong?
- How often do these incidents occur?

$$Risk = Frequency \times Consequence$$

$$Risk = Hazard \times Exposure \times Vulnerability$$

Risk

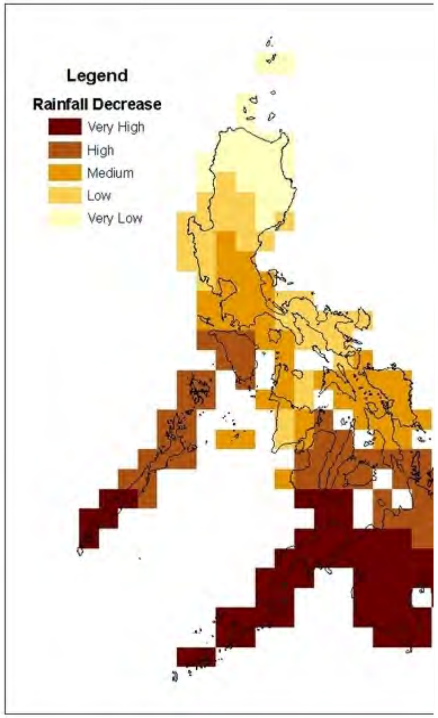
- Potential losses associated with a hazard or extreme events to a given target within a given period of time.

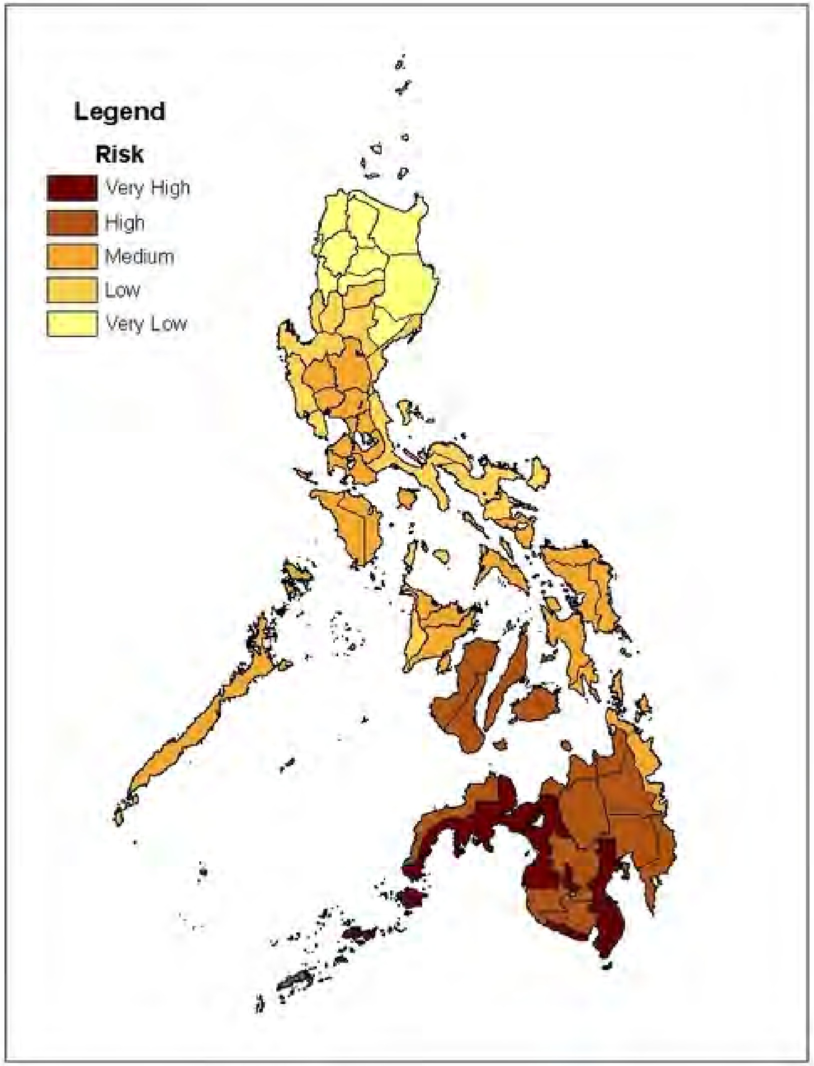
- It can be defined in terms of the adverse consequences (damage/losses) and the probability of occurrence.

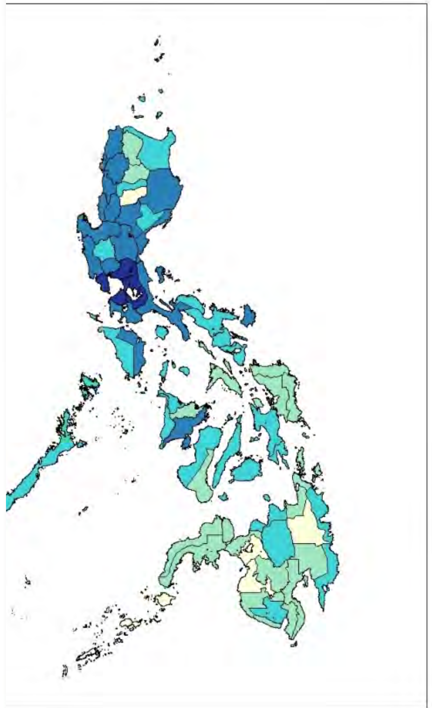
Components of Risk

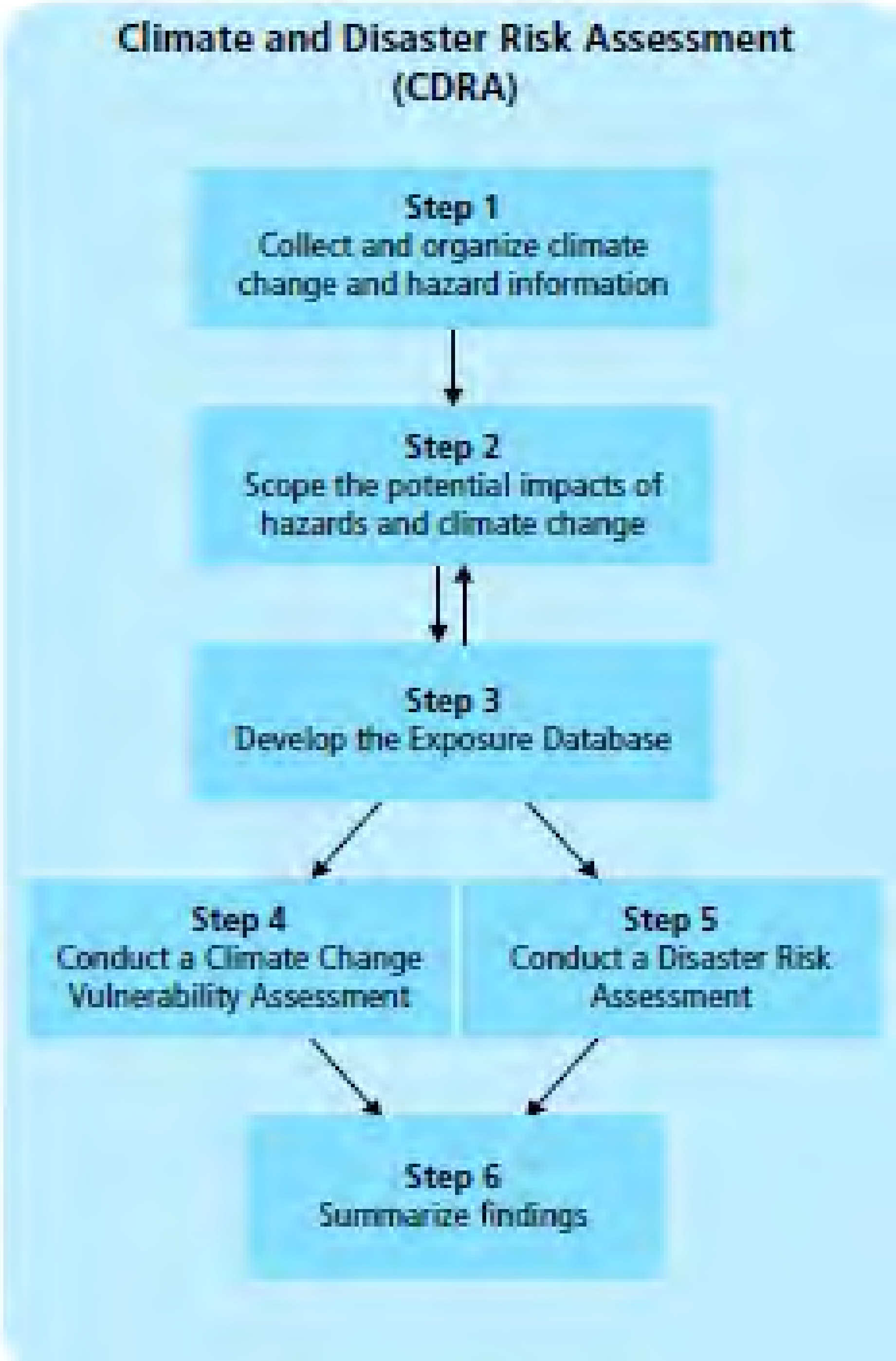
- **Hazard** -The potential occurrence of a natural or human-induced physical event that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, and environmental resources.
- **Exposure** - The presence of people; livelihoods; environmental services and resources; infrastructure; or economic, social, or cultural assets in places that could be adversely affected.
- **Vulnerability**- The propensity or predisposition to be adversely affected.

Mapping and Visualizing Risk







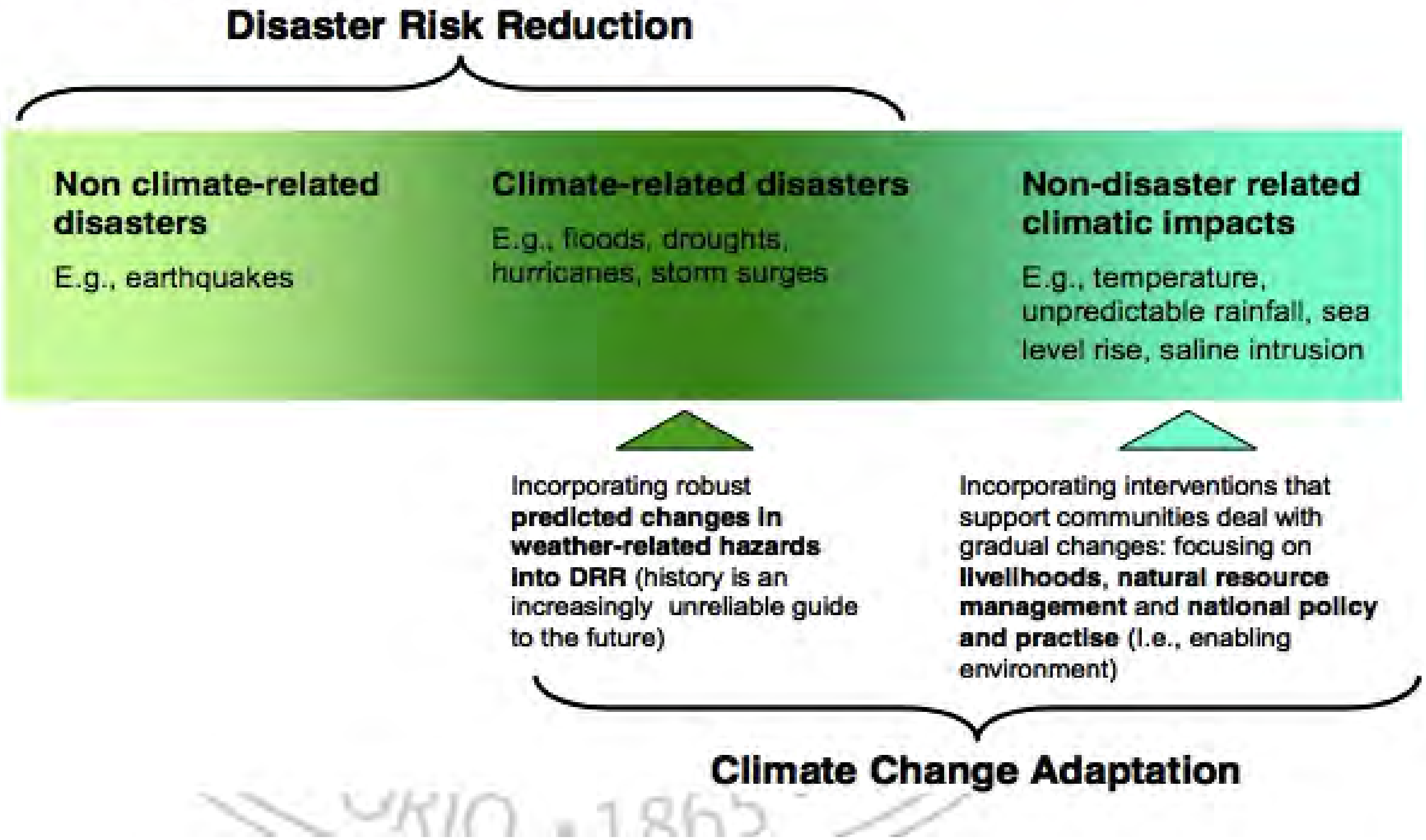


Example: As used in the Comprehensive Land Use Planning Process

HLURB, 2014

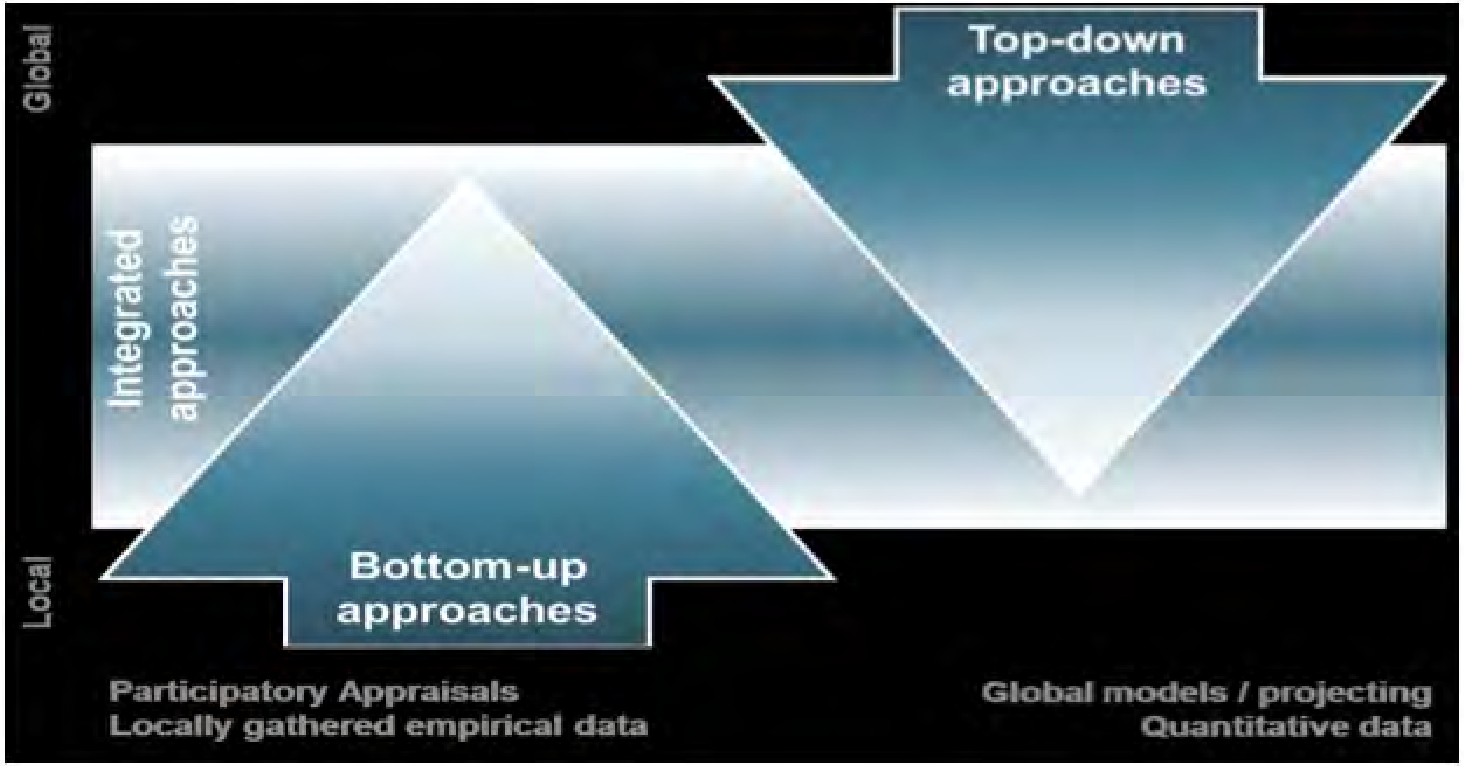
Integrating DRR and CCA

- Common thread- Reduce people's risk to climatic disasters before, during and after disasters



Assessment Approaches

- A common distinction is made between top-down, bottom-up and integrated approaches.



Top Down VAs

- ☐Scenario-driven **assessments** that apply global / regional/ downscaled climate projections to assess potential impacts on physical or natural exposure units, such as watersheds, infrastructure, or agricultural production systems.
- A further classification of top-down approaches is to distinguish
  - Indicator-based: relies on available proxies.
  - Model-based: require more data and analysis.
  - In between, is the impact chain where cause- effect relationships between different components of a systems are depicted.

Bottom Up VAs

- For **bottom-up assessment, the unit of analysis is typically smaller** and more localized, such as households or communities.
- The emphasis is more on **current and short- term time scales**, where vulnerability to current climate variability serves as a starting point for understanding vulnerability to future climate conditions.
- **Local knowled**ge is often integrated through community/stakeholders participatory processes.

Integrated Approach

- A combination of scientific scenario building, quantitative risk assessment using relevant information such as climate projections and ***participatory*** community-based processes.

Stakeholders' Analysis

- Stakeholders should be involved throughout the process.
- In particular they should be involved in determining what will be examined, what adaptations should be considered, and in evaluating results.

Who are the stakeholders

Level of Influence H L

Level of Interest

	Has decision power	Has no decision power
H Directly involved stakeholder	Involve – make them your partner KEY PLAYER	Inform KEEP INFOMED
Not directly involved stakeholder L	Make them happy KEEP SATISFIED	As little as possible MINIMAL EFFORT

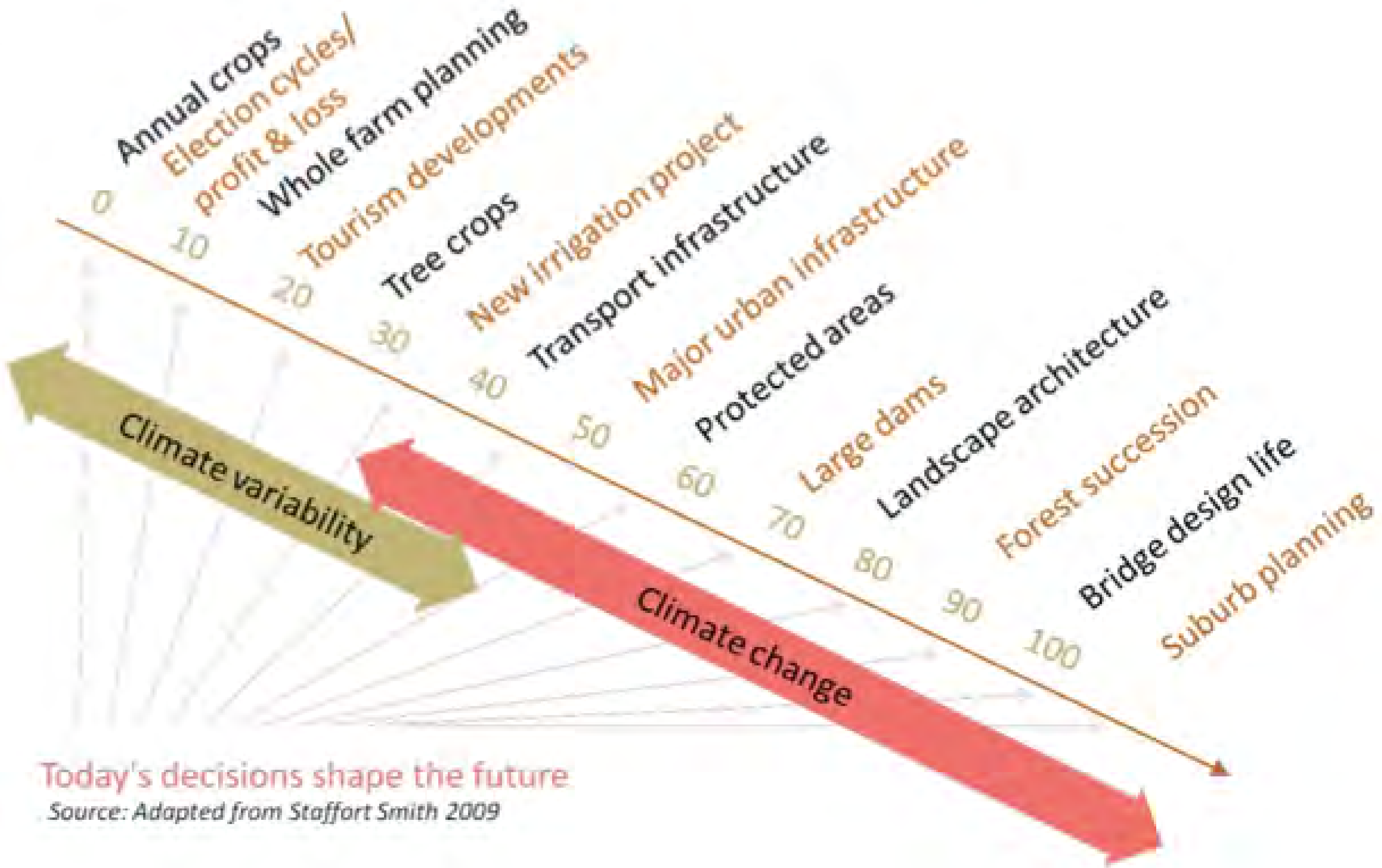
Time Frame

- The time frame being examined is a very important matter.
- If there is more interest in understanding impacts of climate change, then the analysis ought to look over many decades, perhaps out to 2100
- If there is more interest in current vulnerability or adaptation strategies, then the analysis should focus on the next few decades up to about 2050.
- **The near future** could be defined as **2020** and the **far future as 2050**.

Adaptation response

- Two factors appear to predominate in shaping an adaptation response:
  - existing capacity of those responding
  - level of information available about expected climate change

Planning Horizons:
Time Scales Relevant for Development



Today's decisions shape the future

Source: Adapted from Staffort Smith 2009

A continuum from development to climate change

Vulnerability Focus

Impact Focus

1 Addressing Drivers of Vulnerability	2 Building Response Capacity	3 Managing Climate Risk	4 Confronting Climate Change
Increase individual and community buffer	*Build robust systems for problem-solving*	*Make use of climate information in decision-making*	*Respond directly to CC- related threats*
Risk of maladaptation		Risk of maladaptation	Outside the development comfort zone

Need for Climate Information

Normal Development

Direct Adaptation Measures

Framing Adaptation

Vulnerability Focus

Impact Focus

1 **Addressing Drivers of Vulnerability**	2 **Building Response Capacity**	3 **Managing Climate Risk**	4 **Confronting Climate Change**
Increase individual and community buffer	*Build robust systems for problem-solving*	*Make use of climate information in decision-making*	*Respond directly to CC- related threats*
Diversification of livelihood strategies in areas vulnerable to flooding	Participatory reforestation in hillsides to combat flood-induced landslide	Teaching farms to collect climate data and integrate it into their planting decisions	Managing coral reefs in response to widespread coral bleaching

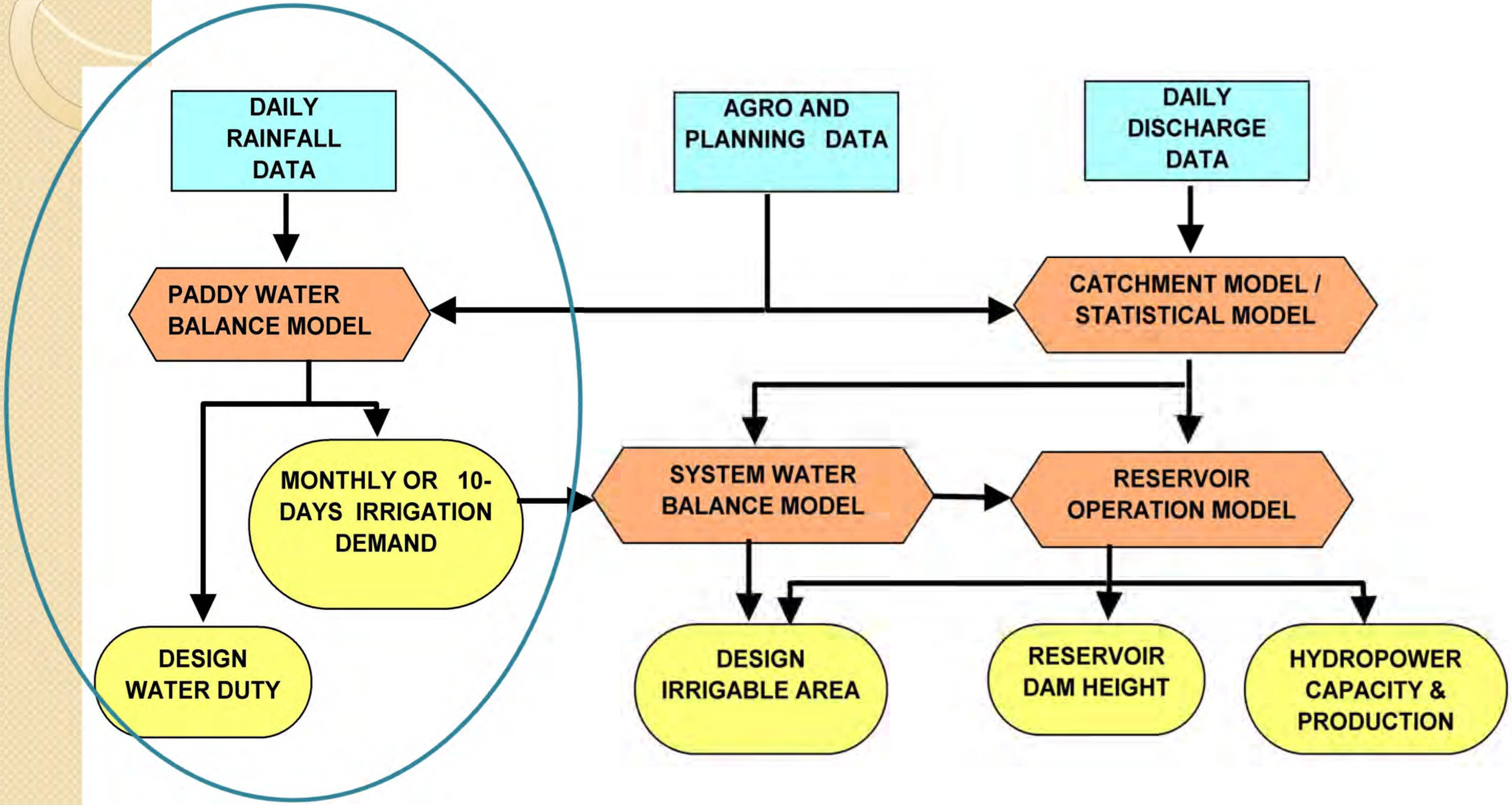
Need for Climate Information

The Philippine Case Study

- Agriculture : highly sensitive sector to the potential impacts of climate change
- Highly dependent on water for crop productivity, to ensure food security
- In the Philippines, the government efforts to adapt to climate change and to achieve rice self-sufficiency necessitate that policies and programs on agricultural water management addresses these needs

- Irrigation infrastructure is required to be robust to cope with these potential threats through
  - physical intervention (e.g. expansion of irrigation area) and
  - operational intervention (e.g. improved irrigation performance).

The Philippine Case Study



An example of how climate change data is used in Impact Assessment - Irrigation Water Requirement Computation

- Computes the design water duty (lps/ha)
- Use to compute irrigation canal capacities

  Water Duty X Service Area = Canal Discharge

- Design level of risk : 1 in 5 year drought
- Assumption farm level computation and uses point rainfall.

THANKYOU !