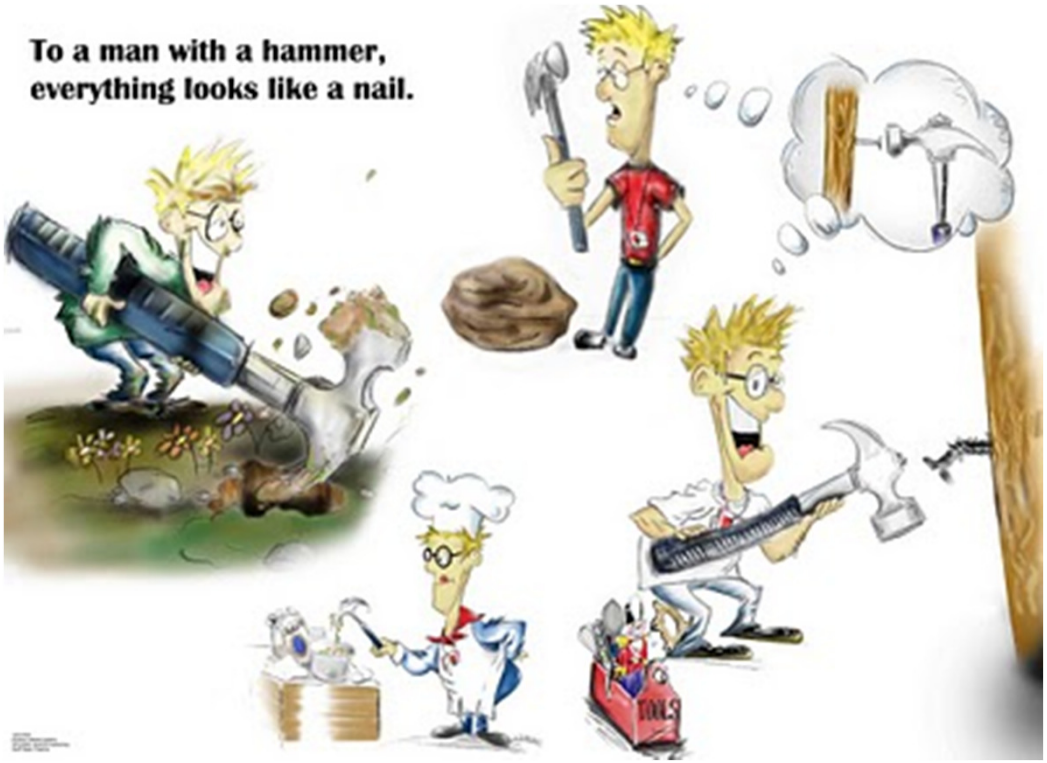
Capacity building to develop and review climate resilient policies

Impacts and vulnerability assessment

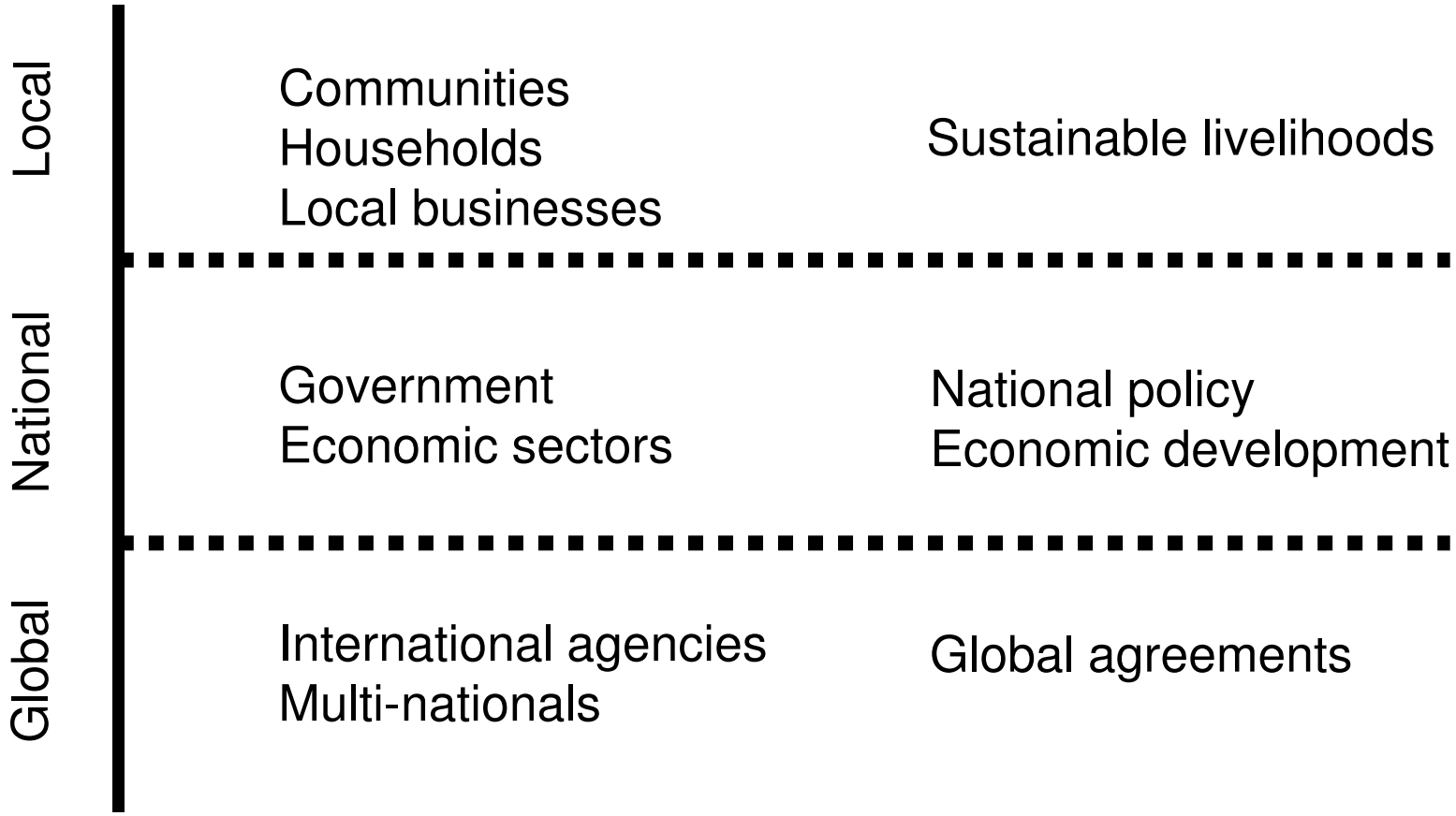
Impacts and vulnerability assessment



Impacts and vulnerability assessment

- What is of concern?
- Who may be affected?
- How far into the future is of concern?
- For what purpose is the assessment to be used?
- What resources are available to conduct the study?
  - Money
  - Staff
  - Expertise
- How much time is available?

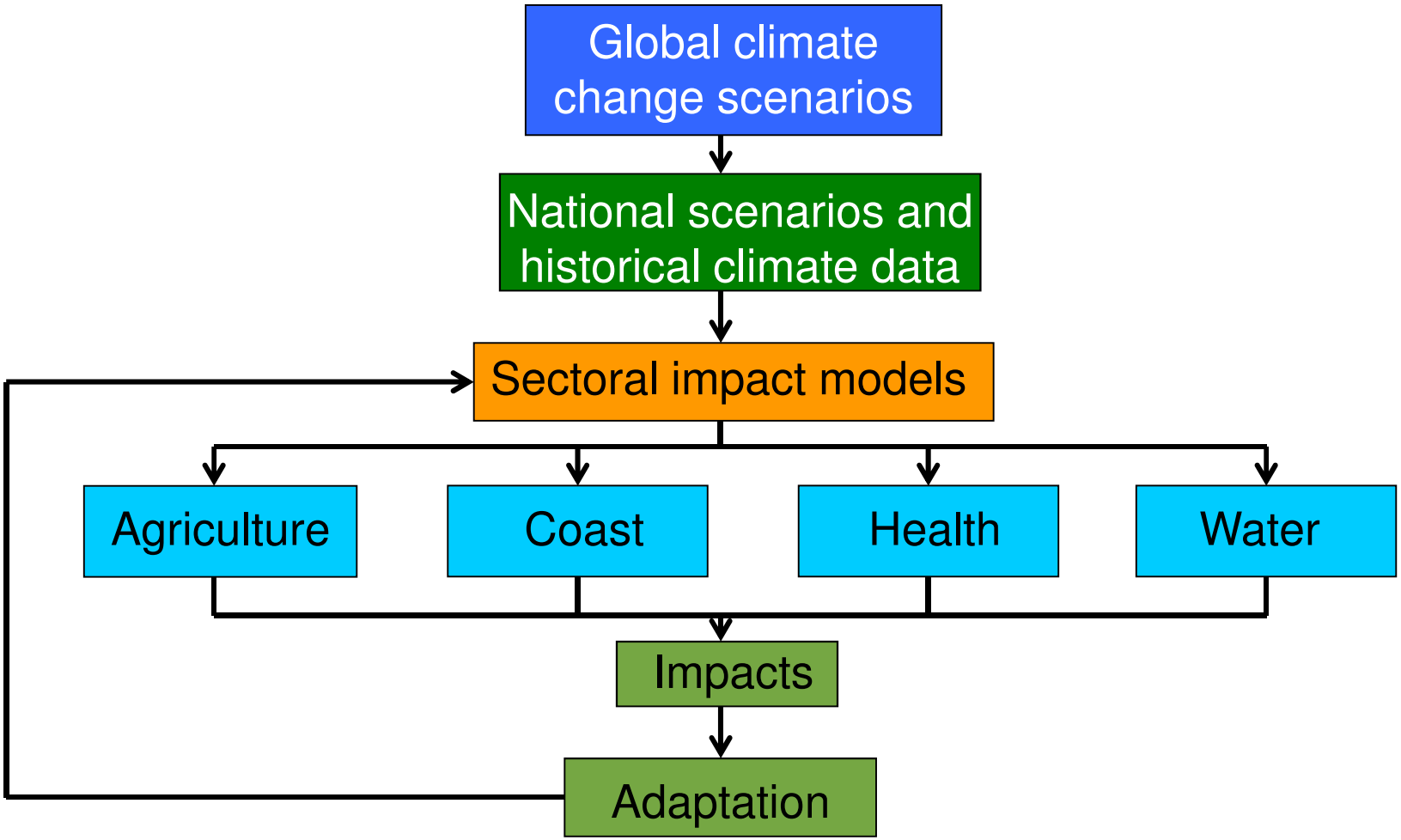
Different scales of assessment and adaptation response



Impacts

- Impacts are a function of two factors:
  - Exposure – what is at risk and what it is being exposed to
  - Sensitivity – what is the biophysical effect
- Normally identified through quantitative assessments, but can be assessed qualitatively

Impact assessment



Vulnerability

- Vulnerability is a function of three factors:
  - Exposure
  - Sensitivity
  - Adaptive capacity
- Can involve both qualitative and quantitative assessments

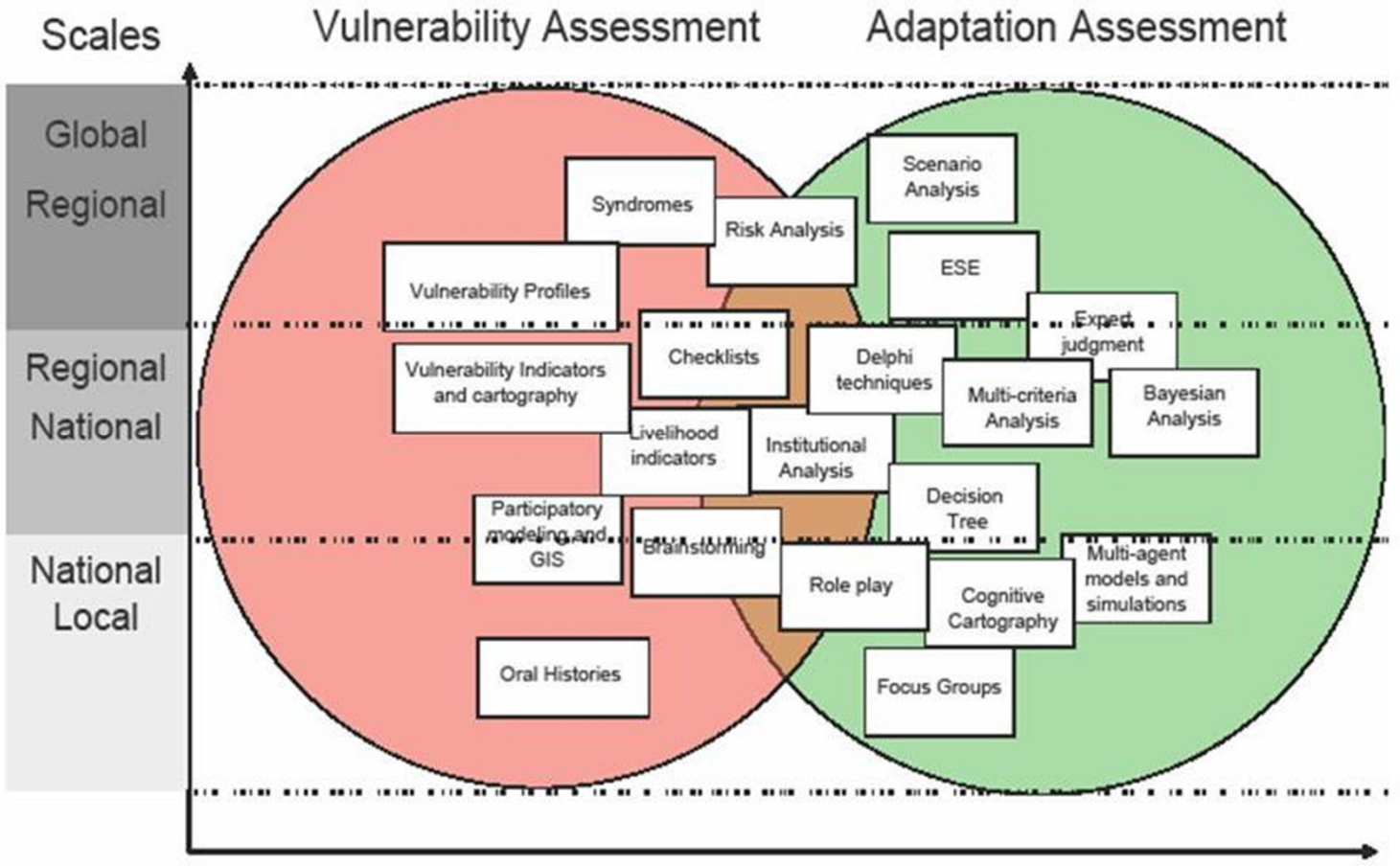
Adaptation

- “Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities” *IPCC, 2007*

Adaptive capacity

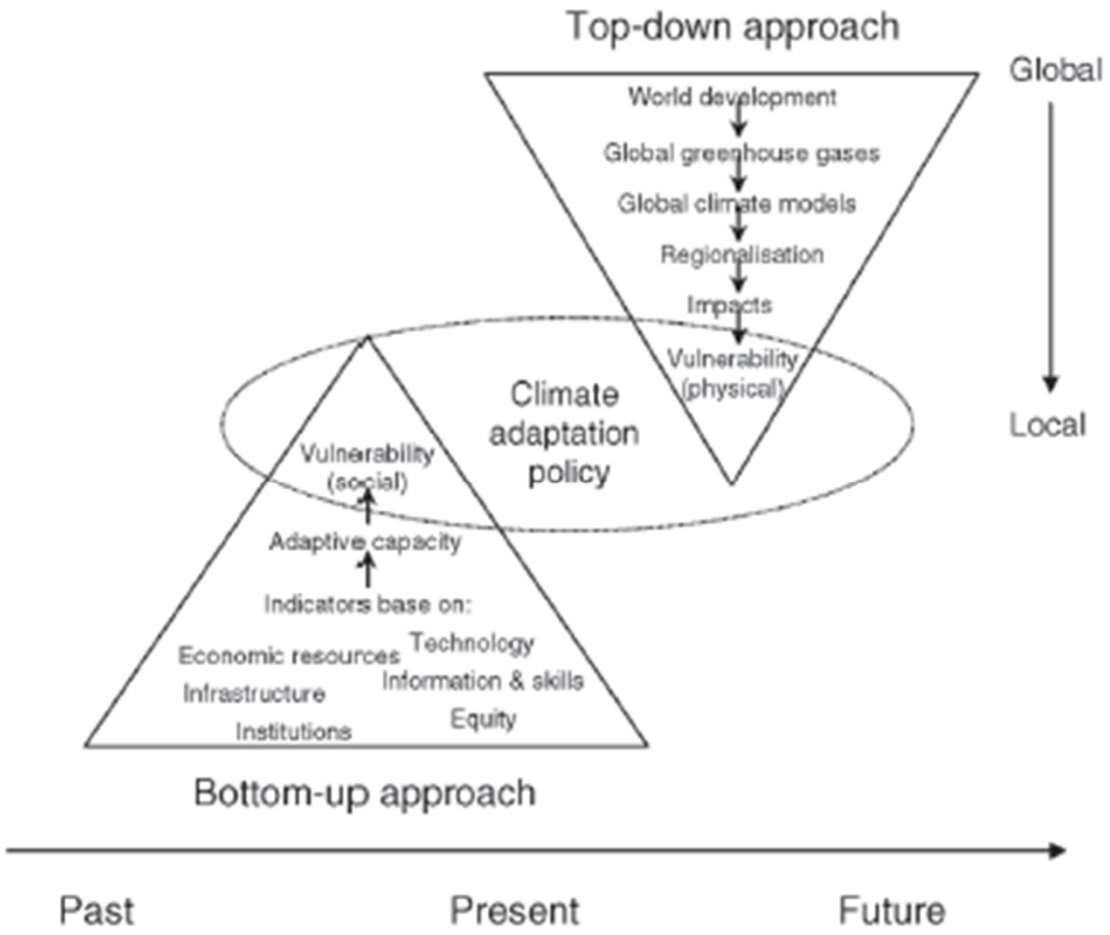
- “The ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences” *IPCC, 2007*

Different V&A assessment approaches

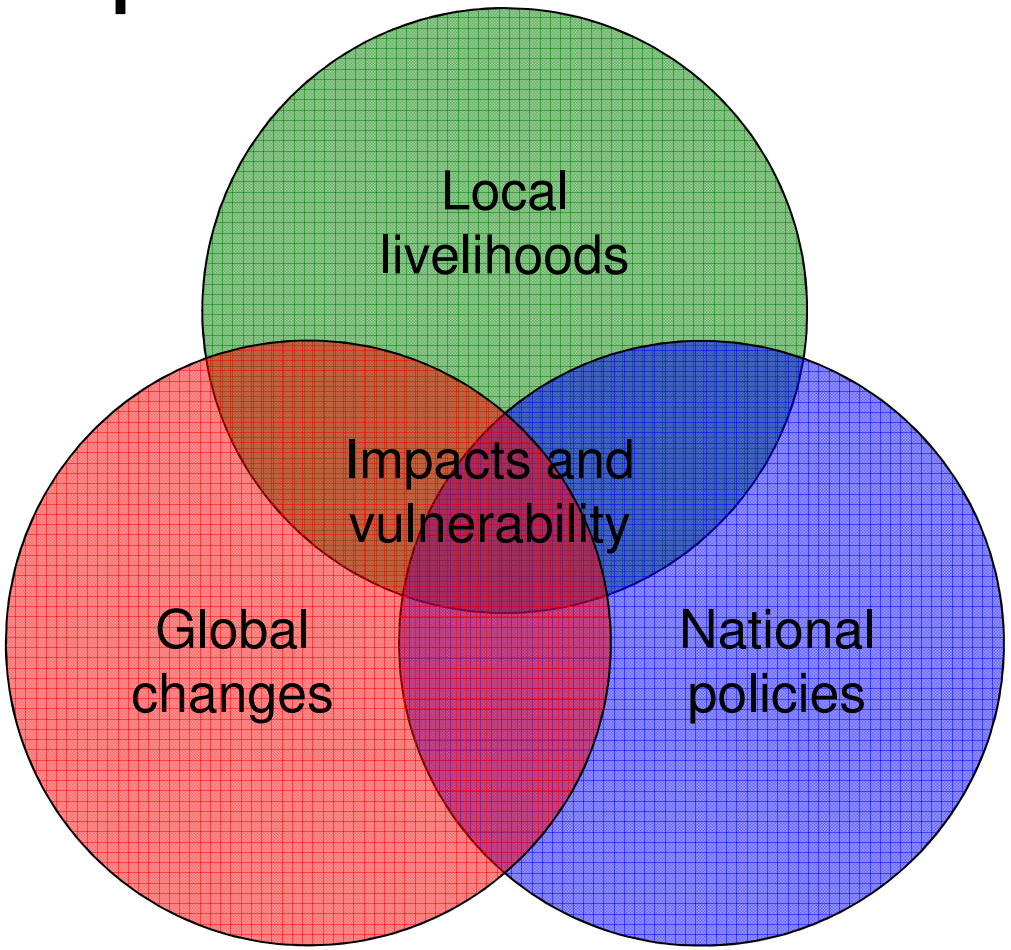


Source: Downing and Ziervogel, 2004

“Top Down” vs. “Bottom Up”



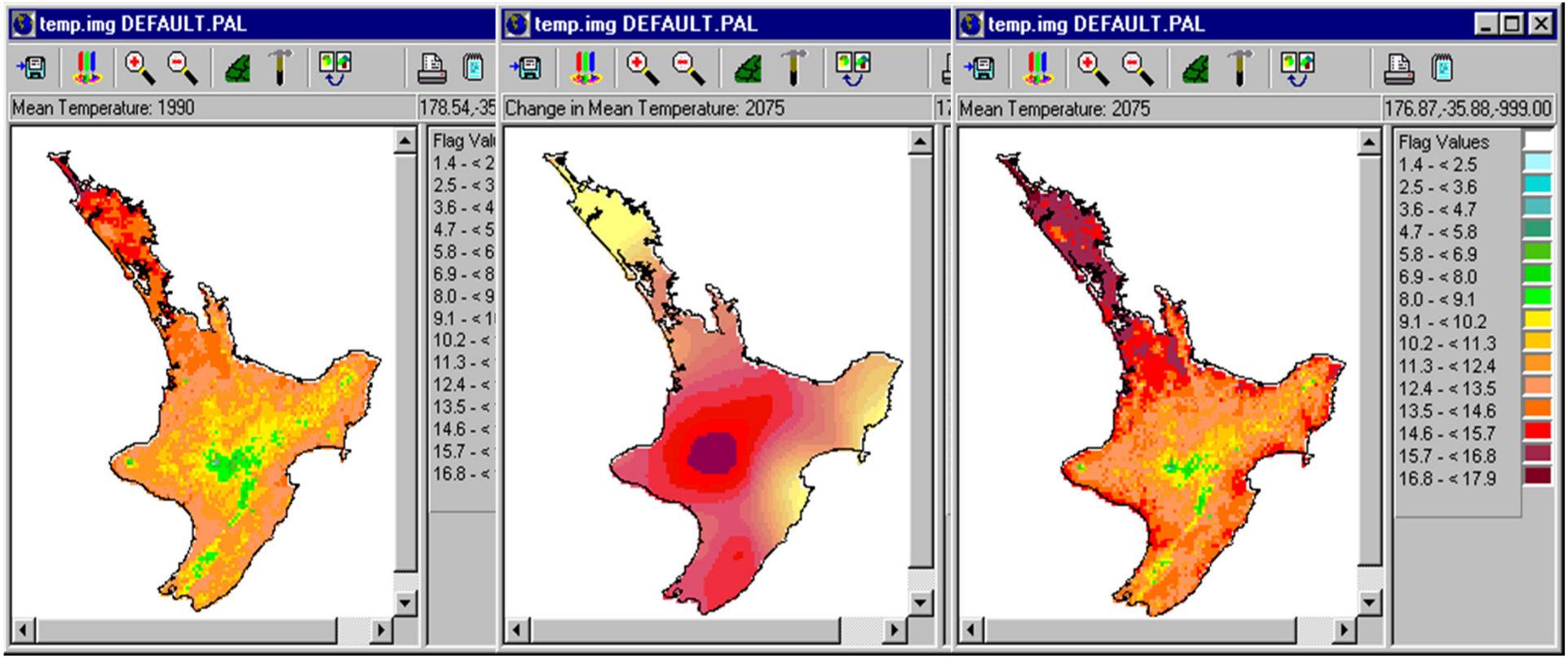
In reality we're all interdependent



Impacts, vulnerability & adaptation approaches

Reflections from two examples

Present and future climate

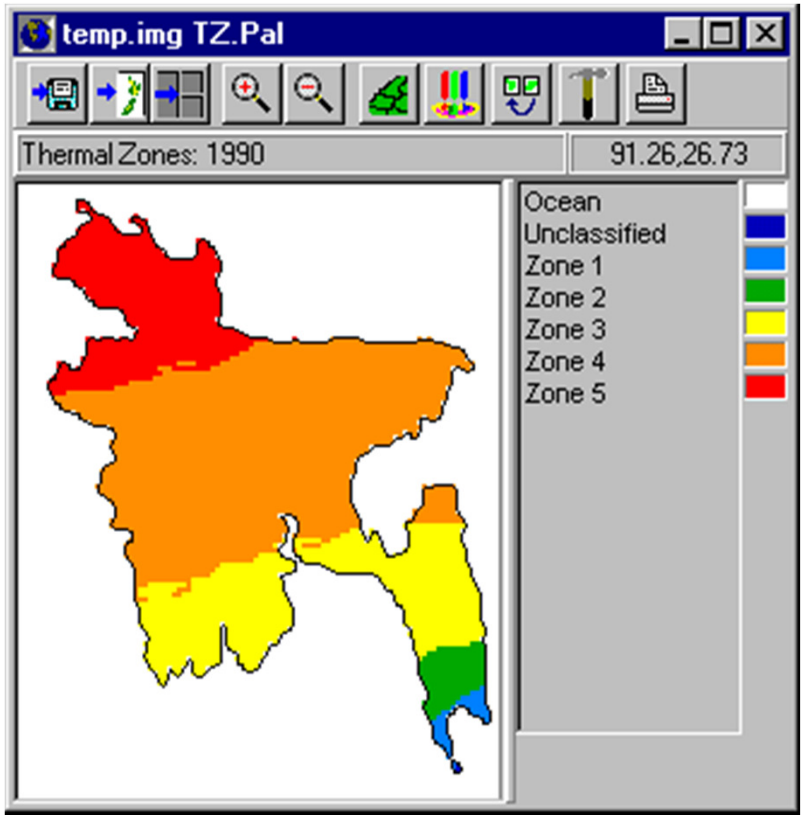


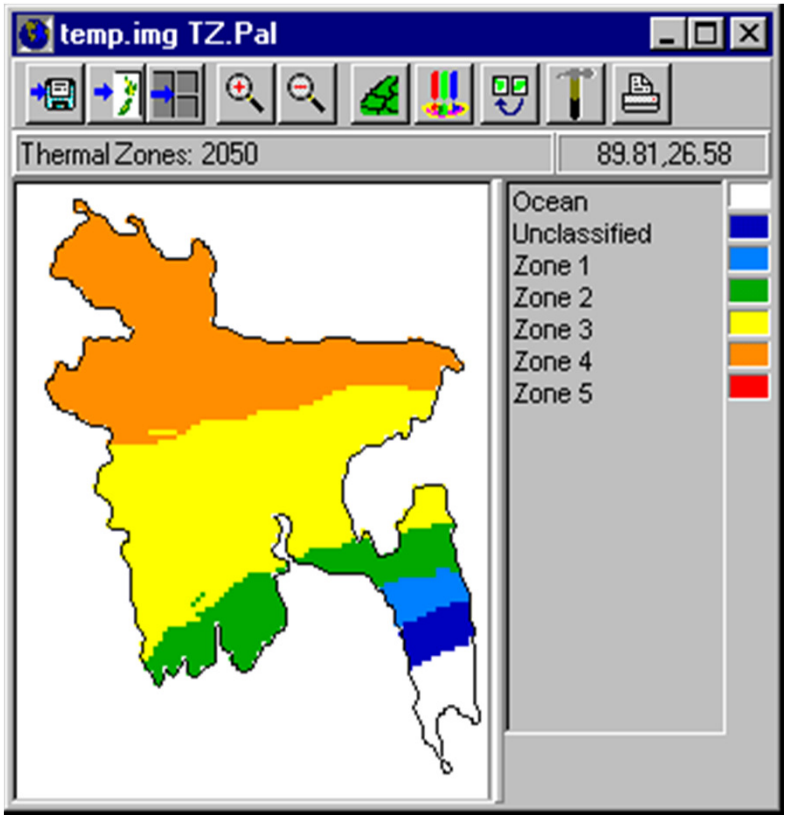
Present

Change pattern

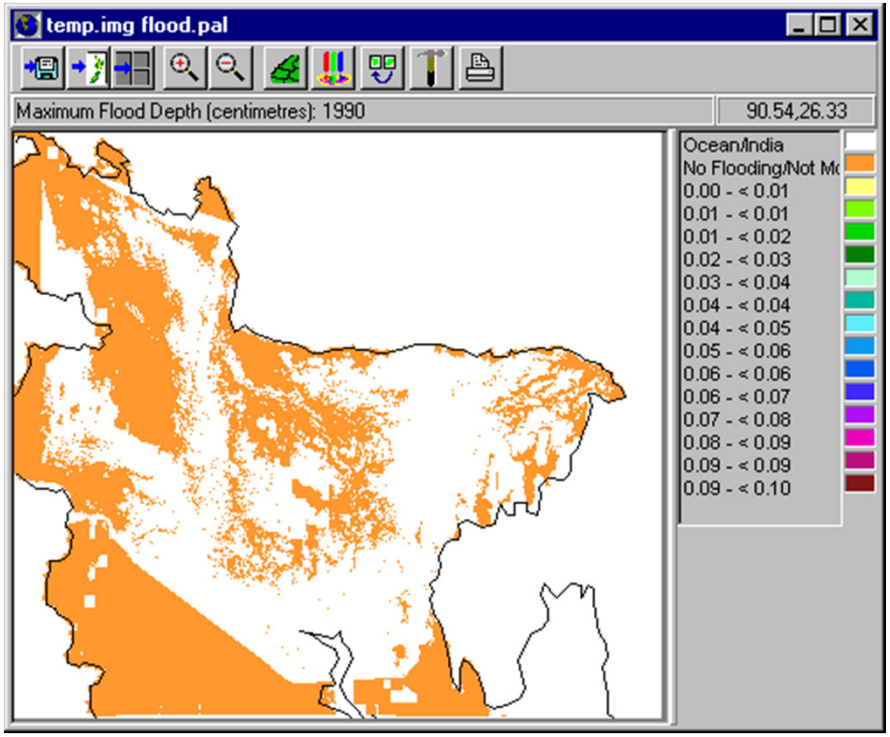
2075

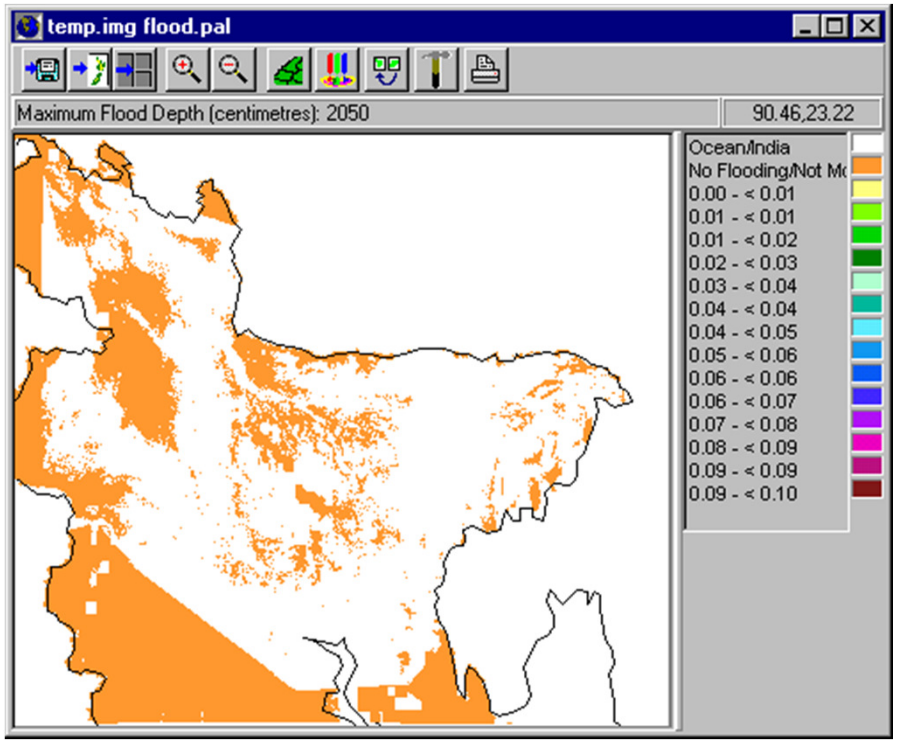
Change in agroclimatic (*thermal*) zones for 2050, relative to 1990





Changes in flooded area





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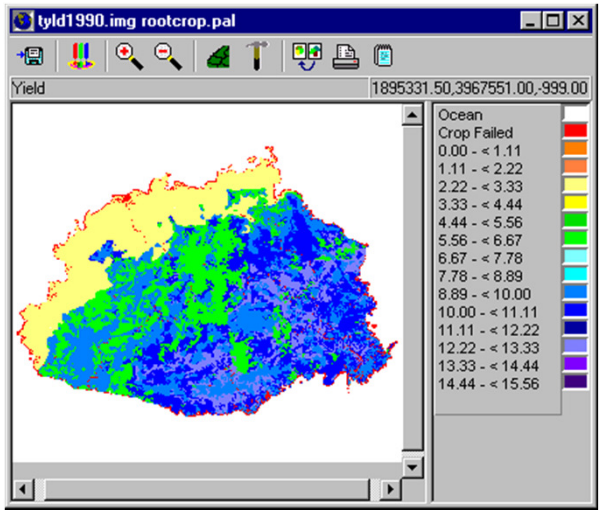
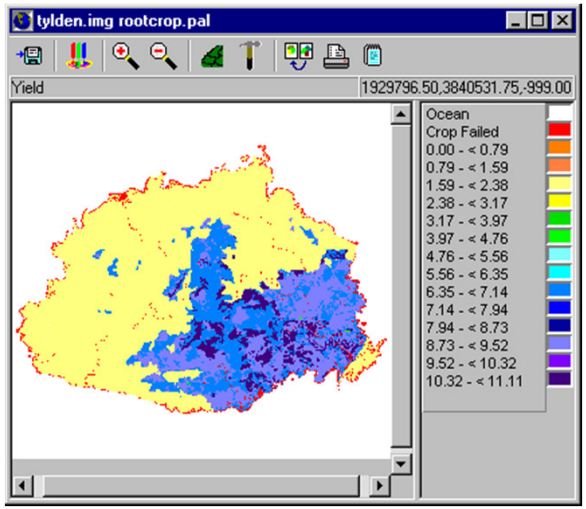
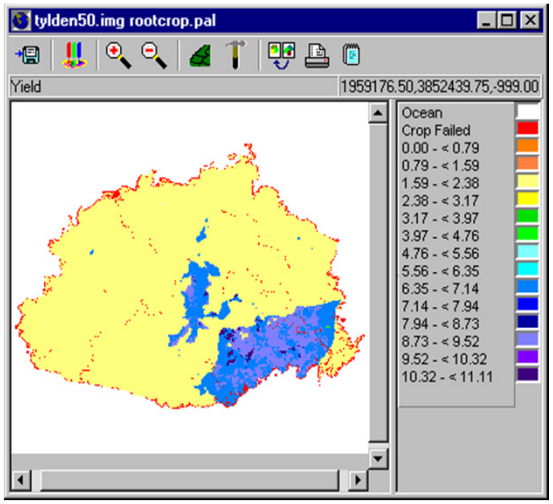
Effects of intensified El Nino drought on dalo



1990



Current El Nino



2050 El Nino

Advantages

- Quantitative analysis
- Quick running and flexible
- Spatial and temporal analyses
- Multi-scale - national, regional, sites
- Examination of uncertainties
- Instructional, training tool

Disadavantages

- Linear assessment
- Narrow focus on available models and parameters
- Often not connected to real world situations
- Can be expensive
- Limited use and uptake despite considerable investment

Adapting to climate change in the NZ kiwifruit industry

EARTHWISE CONSULTING

NZ kiwifruit adaptation study

- Focus on in-depth consultations with key growers
  - Current climate challenges
  - Management responses
  - Climate change challenges and opportunities
  - Adaptations
  - Industry and government responses

Climate change projections

- Temperature increases of about 1ºC by 2040 and 2ºC by 2090
- Temperature changes are non-linear
- Increased westerly winds in winter and spring
- More rainfall in the west, drier in the east and north
- Decreased frost risk, increased frequency of higher temperatures, increased frequency of extreme daily rainfalls

Source: Climate Change Effects and Impacts Assessment,
A Guidance Manual for Local Government in New Zealand
2nd Edition (NIWA Ltd, MWH NZ Ltd, Earthwise Consulting Ltd)

Climate change challenges and opportunities

- More extreme weather events
- Less winter chill
- Warmer autumns, challenges at harvest
- Increased rainfall variability, protect water
- Salt water intrusion near the coast
- Pests and diseases, biosecurity
- Warmer spring and summer good for dry matter
- Warmer climate and higher CO_2 good

Future adaptations

- Increased plantings of Gold
- New varieties
- Biennial cropping
- Shelter developments
- HC substitutes
- Biological management, shift to more organic-type approaches
- Water
- Better coolstore design
- Use Kerikeri as “benchmark” for the Bay of Plenty
- Smaller, marginal, growers exiting industry
- Rationalisation to larger professional operators and highly skilled smaller-scale operators

Planned adaptation

- Industry needs to be proactive in maximising opportunities
- Integrate adaptation into evolving sustainability focus
- A united approach is very important
- Bring key growers together
- Focus on education and communication
- Basic research is needed
  - Plant breeding
  - Crop protection
  - Water use
- Water issues still need to be resolved
- Protection of single desk

Advantages

- People focused
- A whole industry/sector approach
- Draws on existing knowledge and expertise
- Supported by the industry and growers

Disadvantages/challenges

- Can be time consuming
- Potential to reinforce existing actions rather than face the future
- Requires commitment to on-going engagement in change processes

Summary

- Work within the resource limitations that you have
- Stakeholder engagement is of fundamental importance
  - If you want action you need to work with the doers
  - If you want success you need to engage with communities
- Keep things as simple and doable as possible
- Use local (in-country) knowledge and expertise as much as possible
- Use quantitative assessment approaches selectively and cautiously