

Capacity building to develop and review climate resilient policies





Impacts and vulnerability assessment

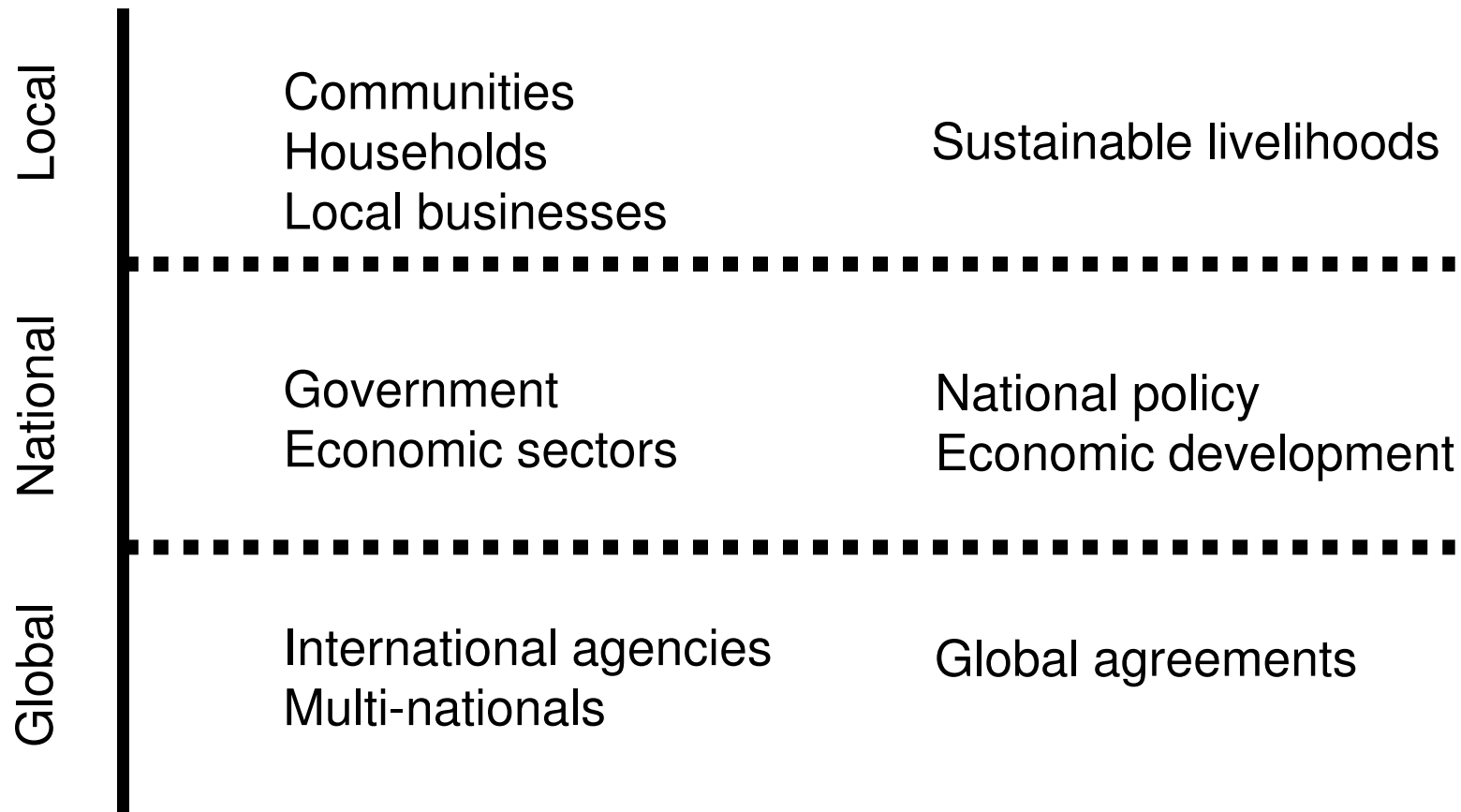
Impacts and vulnerability assessment



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

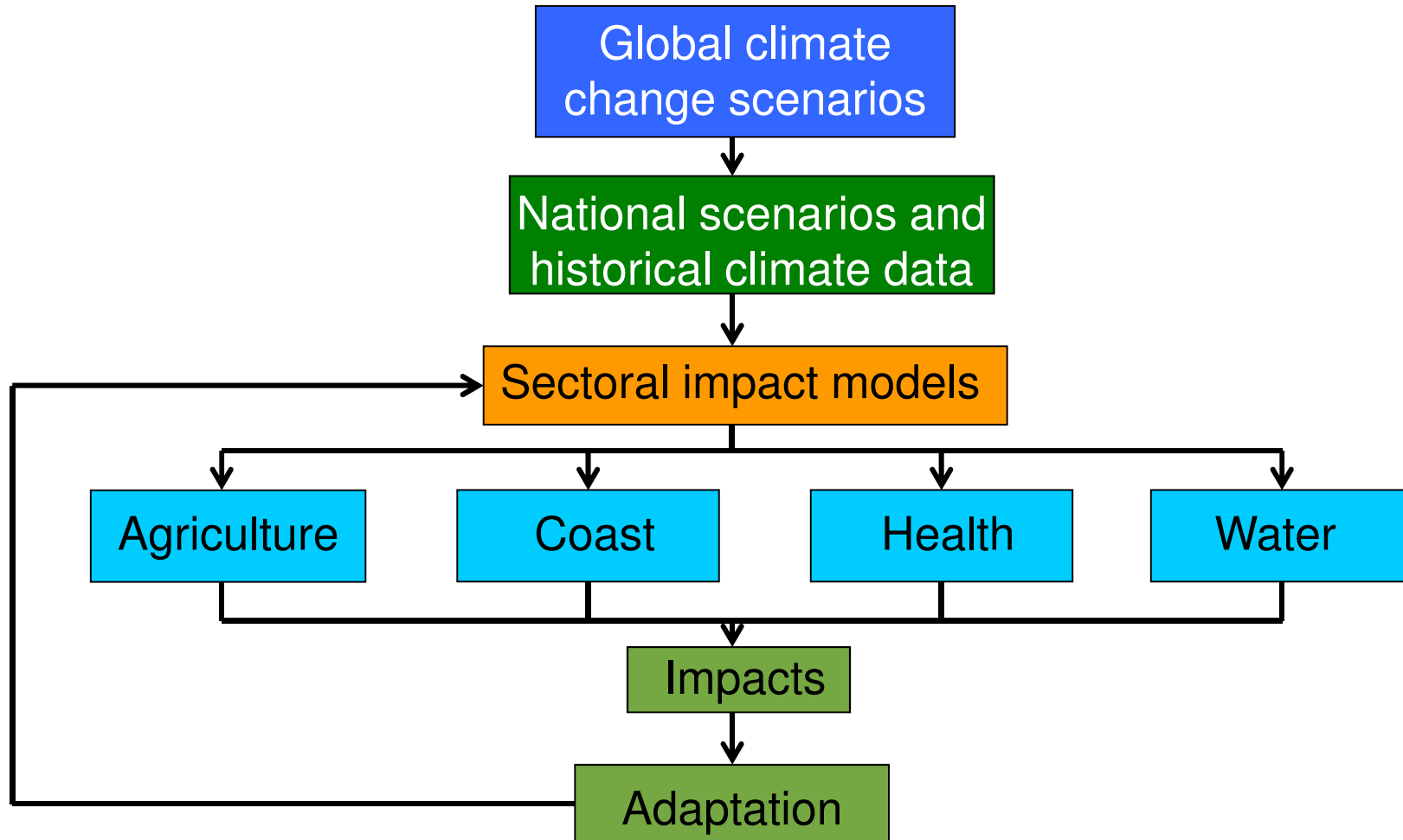


Impacts

- 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*

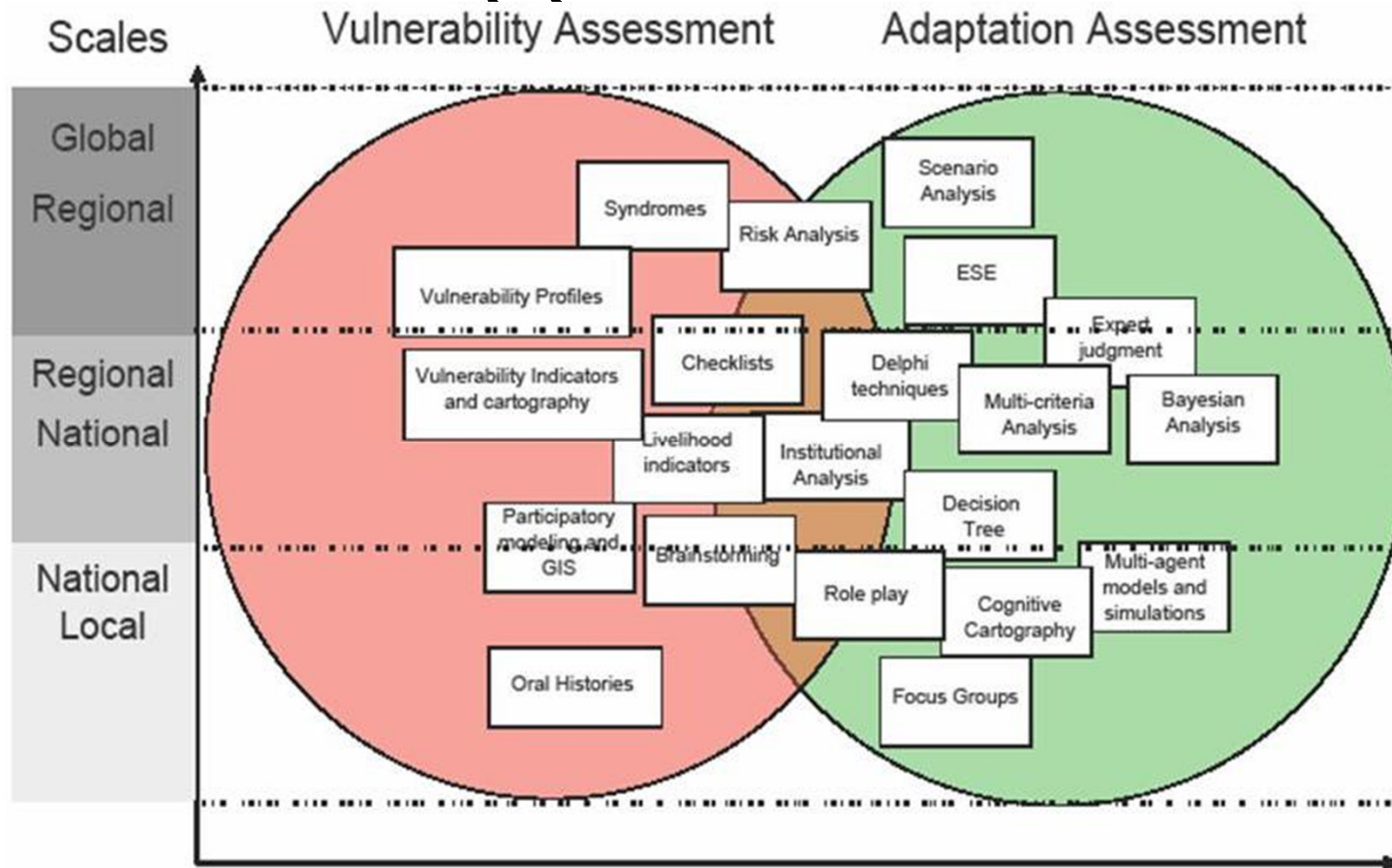


Adaptive capacity

- “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*

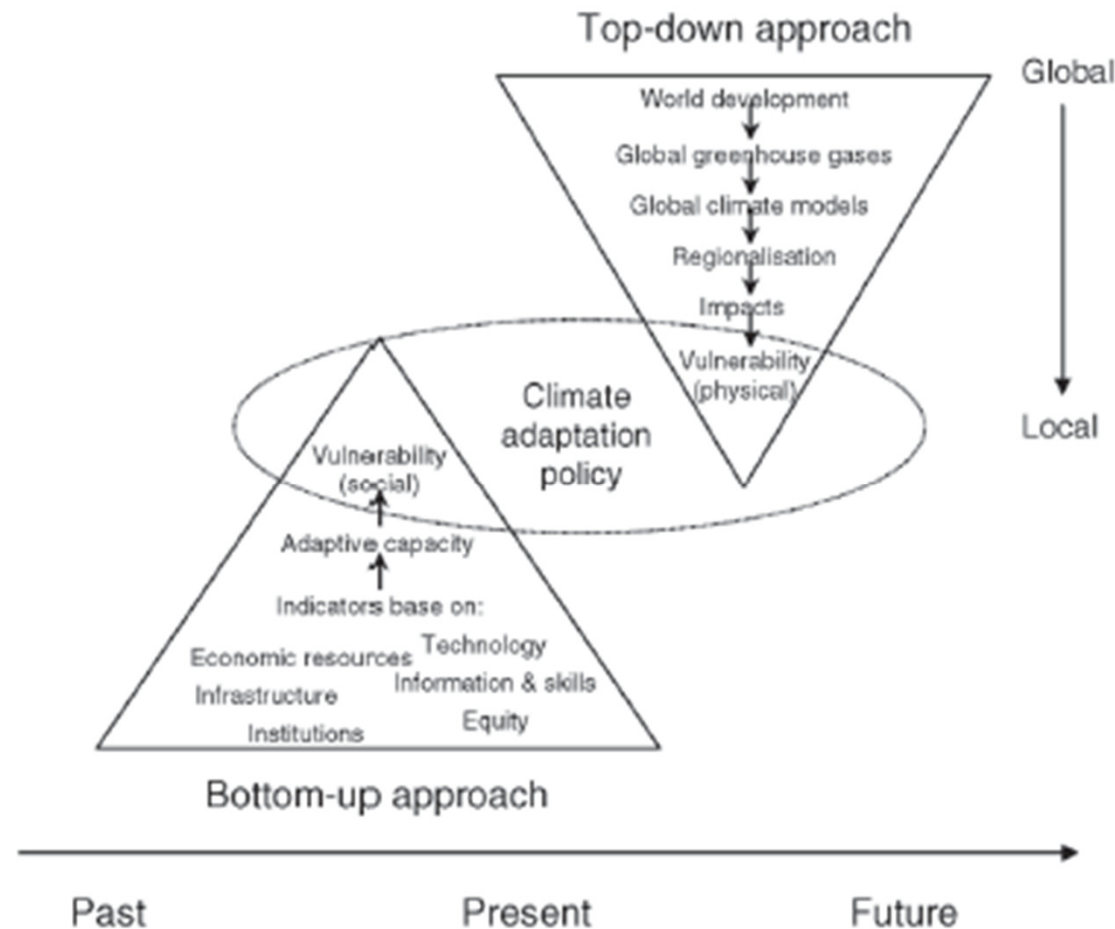


Different V&A assessment approaches

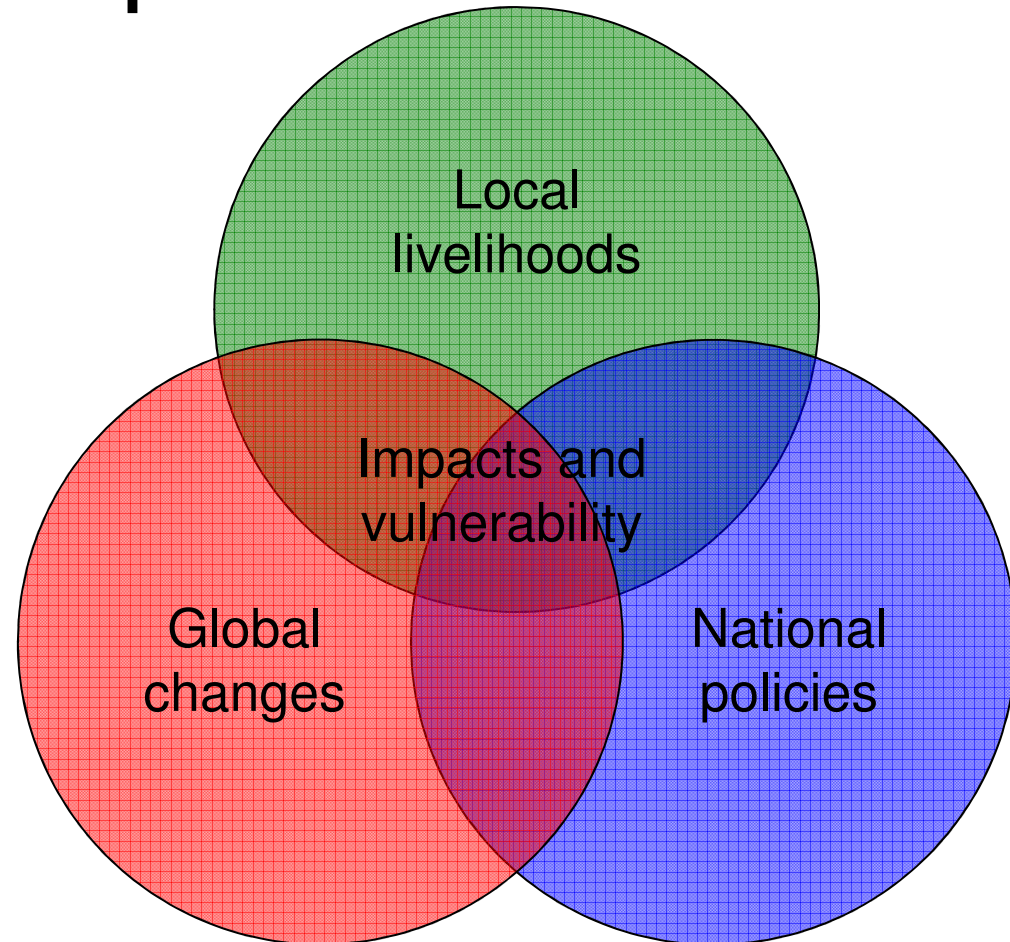


Source: Downing and Ziervogel, 2004

“Top Down” vs. “Bottom Up”



In reality we're all interdependent

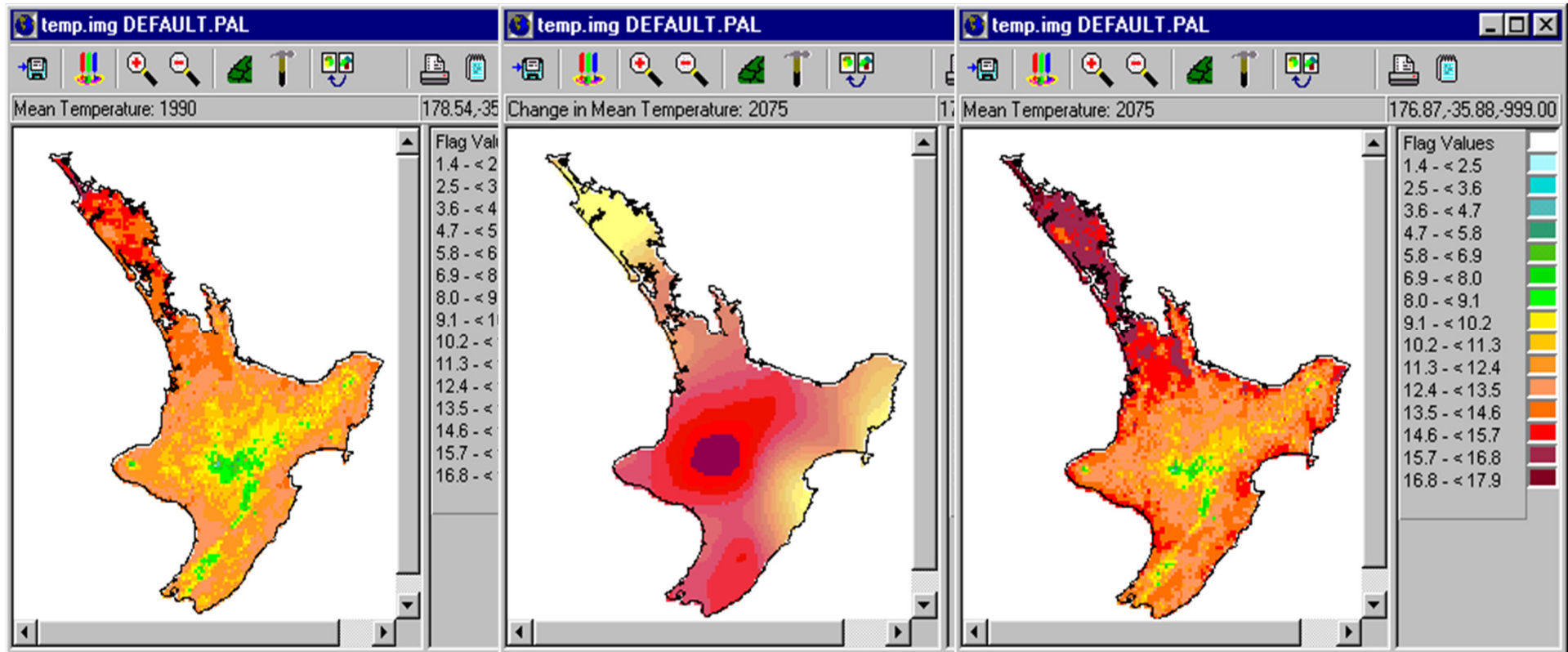


Impacts, vulnerability & adaptation approaches



Reflections from two examples

Present and future climate

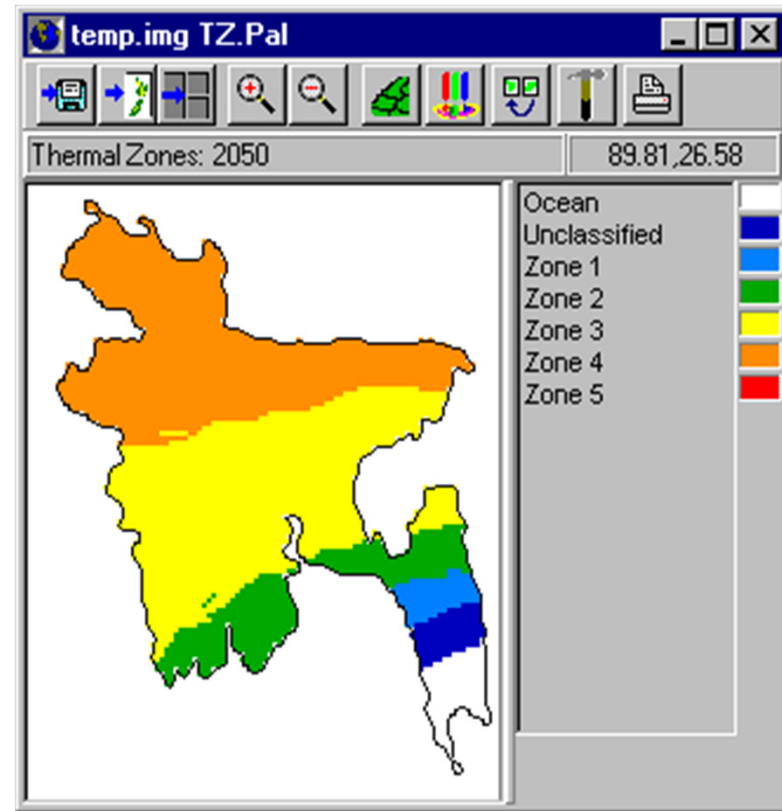
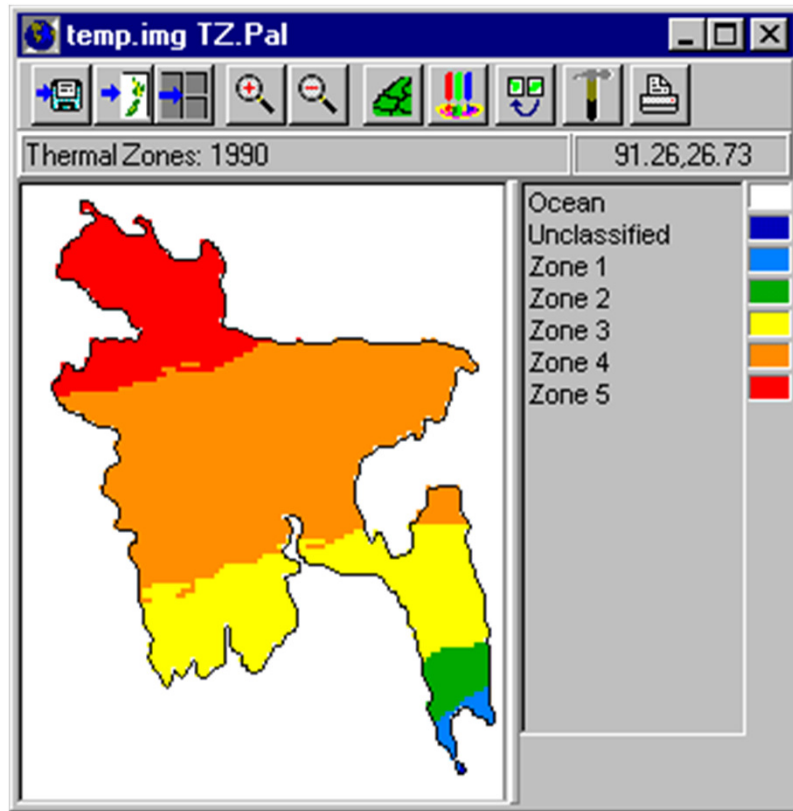


Present

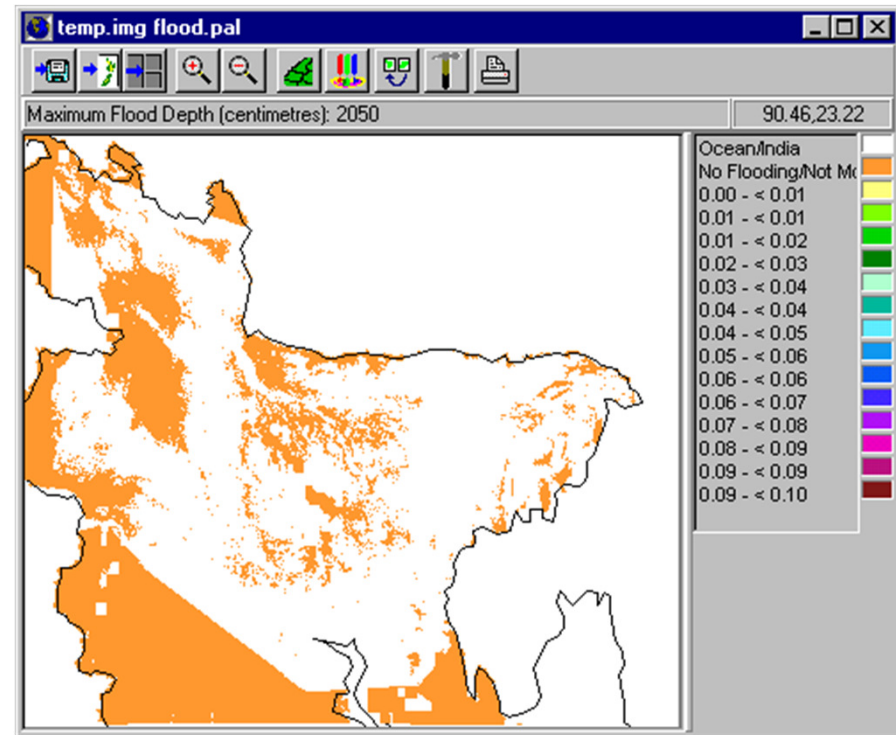
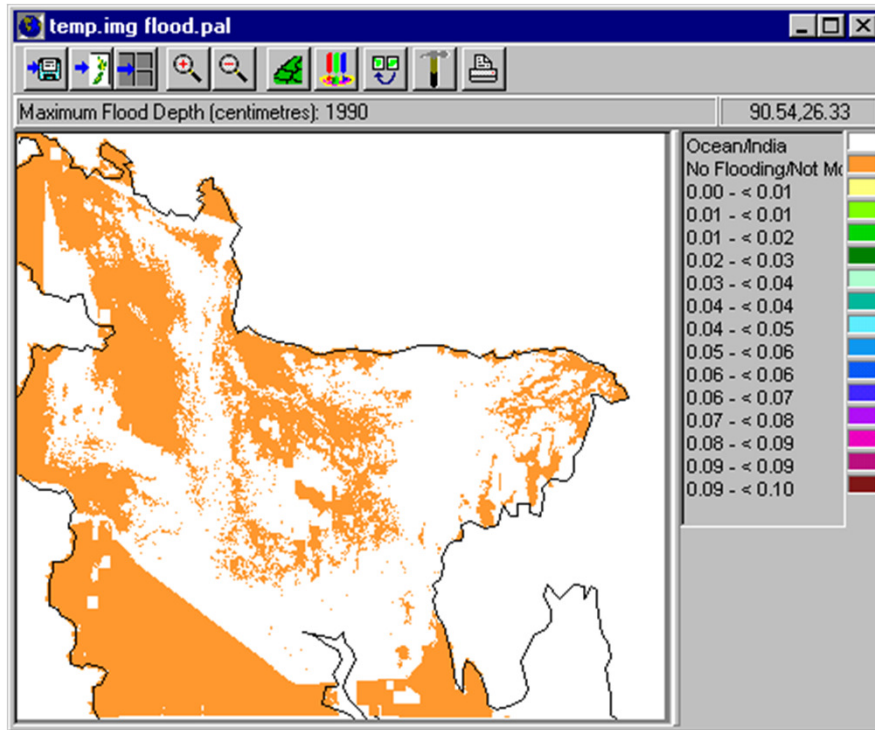
Change pattern

2075

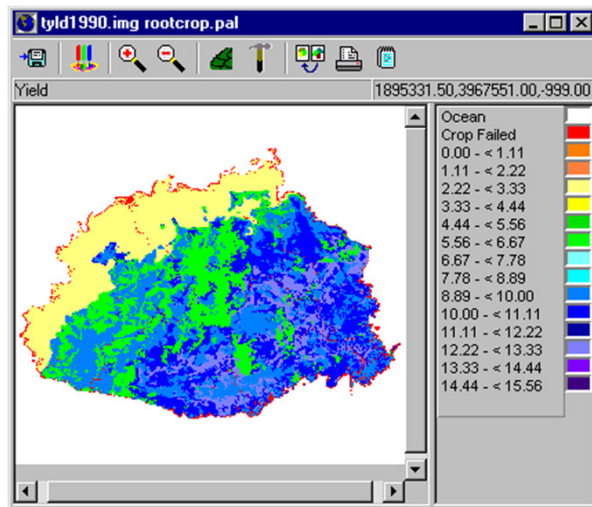
Change in agroclimatic (*thermal*) zones for 2050, relative to 1990



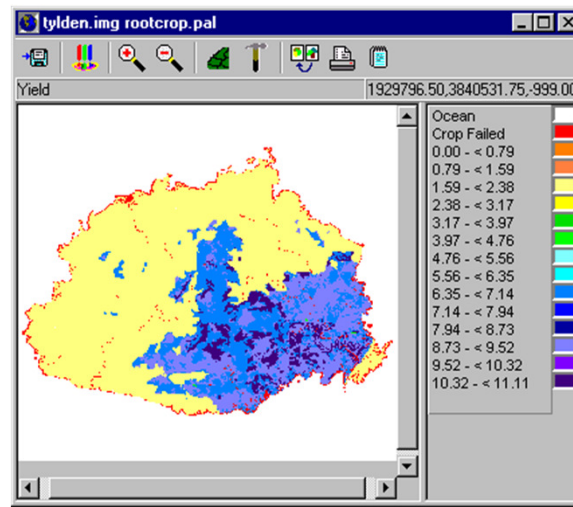
Changes in flooded area



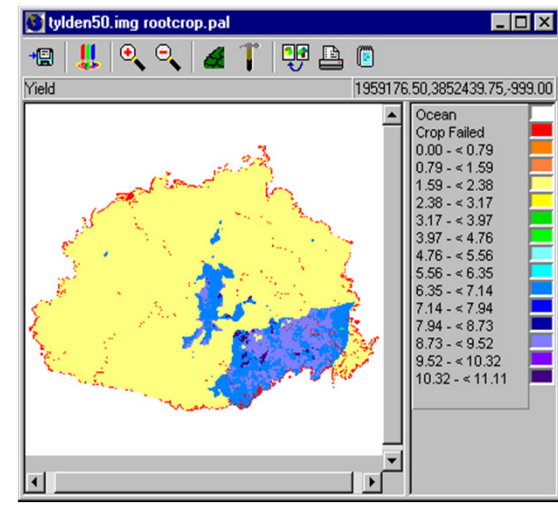
Effects of intensified El Nino drought on dalo



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

Disadvantages

- 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

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 1°C by 2040 and 2°C 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 CO₂ 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



Climate resilience

Key adaptation principles

- Work in partnership
- Cope with uncertainty
- System vulnerability and resilience
- Manage climate and non-climatic risk
- Sustainable development context
- Explore co-benefits
- Iterative approach
- Action focus
- Low/no regrets approach
- Avoid maladaptation
- Multiple scales of governance

Climate resilience

Issues associated with mainstreaming

- Working with nature
- Maladaptation
- Vulnerability and resilience
- Future pathways – the sustainability context
- Managing change – the psychology of change
- The importance of innovators
- Participatory approaches
- Integrating ‘top down’ and ‘bottom up’
- A few other things to consider

Our relationship with nature

“Look deep into nature, and then you will understand everything better.” Albert Einstein



J Constable, Old Sarum
Watercolour, painted in 1834



Source: G Kenny, Old Sarum, 2007

“The future condition of the globe's interlocking natural and social systems depends more on human behaviour than on the further investigation of natural processes, however desirable that may be.” White, 1991



Maladaptation



“The whole course of civilization ... may be seen as a process of trading up on the scale of vulnerability.” Brian Fagan

Maladaptation cont.

Tourism and sugar production, Fiji



Maladaptation cont.

Shopping complex development, Mauritius



Vulnerability and resilience



Vulnerability

- Exposure
- Sensitivity
- Adaptive capacity



Resilience

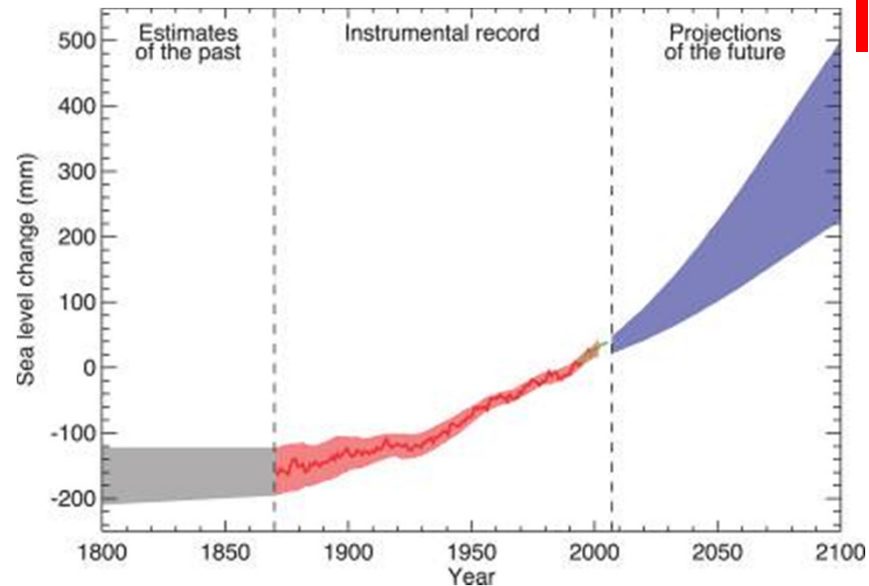
- Buffering capacity
- Capacity for self-organisation
- Adaptive capacity

Resilience



“Ecosystem resilience is the capacity of an ecosystem to tolerate disturbance without collapsing into a qualitatively different state that is controlled by a different set of processes. A resilient ecosystem can withstand shocks and rebuild itself when necessary. Resilience in social systems has the added capacity of humans to anticipate and plan for the future.” www.resalliance.org

Future pathways

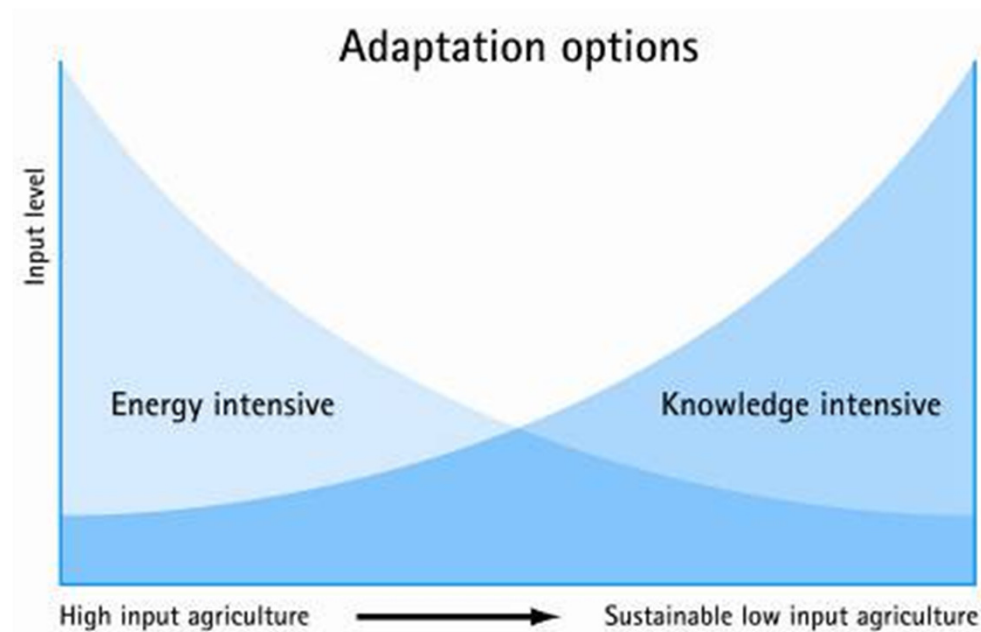


Sea-level rise of 0.9 – 1.6m is increasingly possible

- A 'Business-As-Usual' pathway will have serious consequences
- Extra-ordinary responses are required

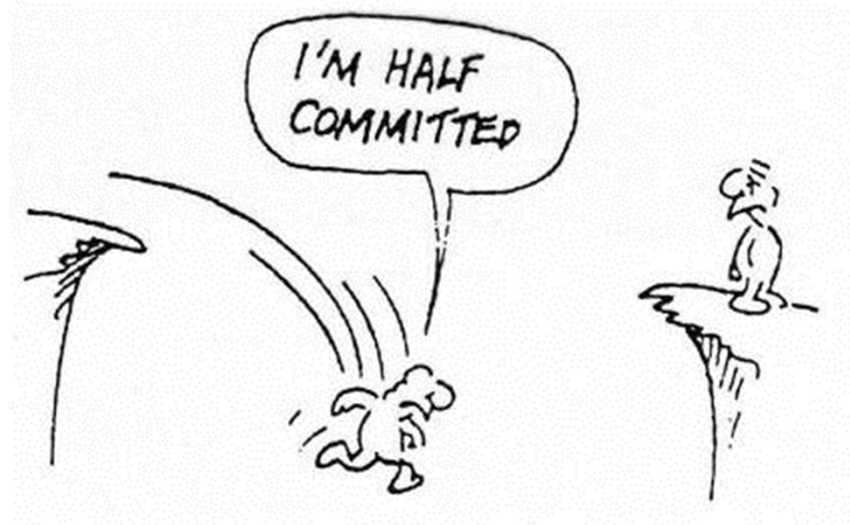
Adaptation pathways

Shifting from fossil fuel dependence to ecological complexity and knowledge systems

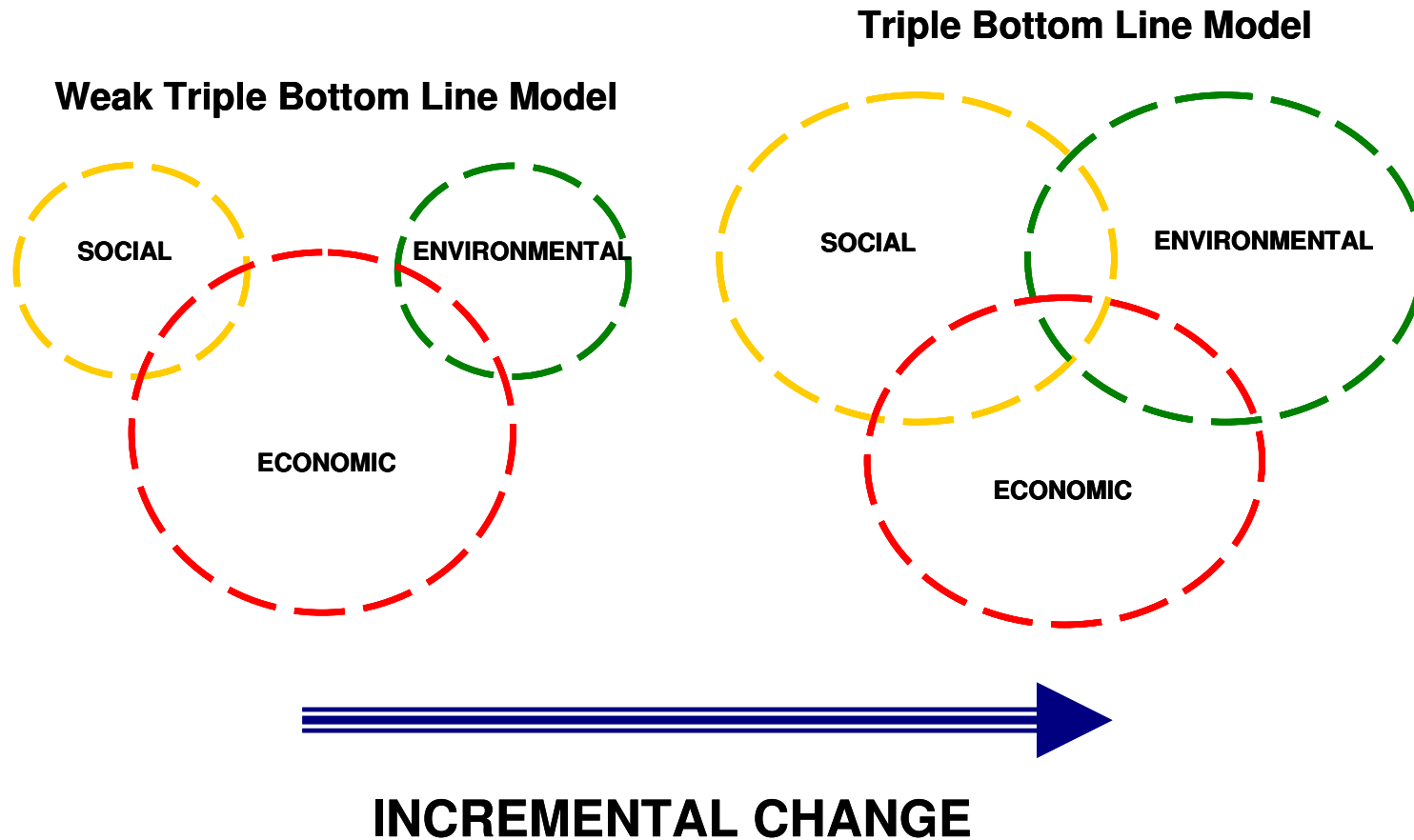


Source: Kenny, 2011, Climatic Change, 106: 441-462

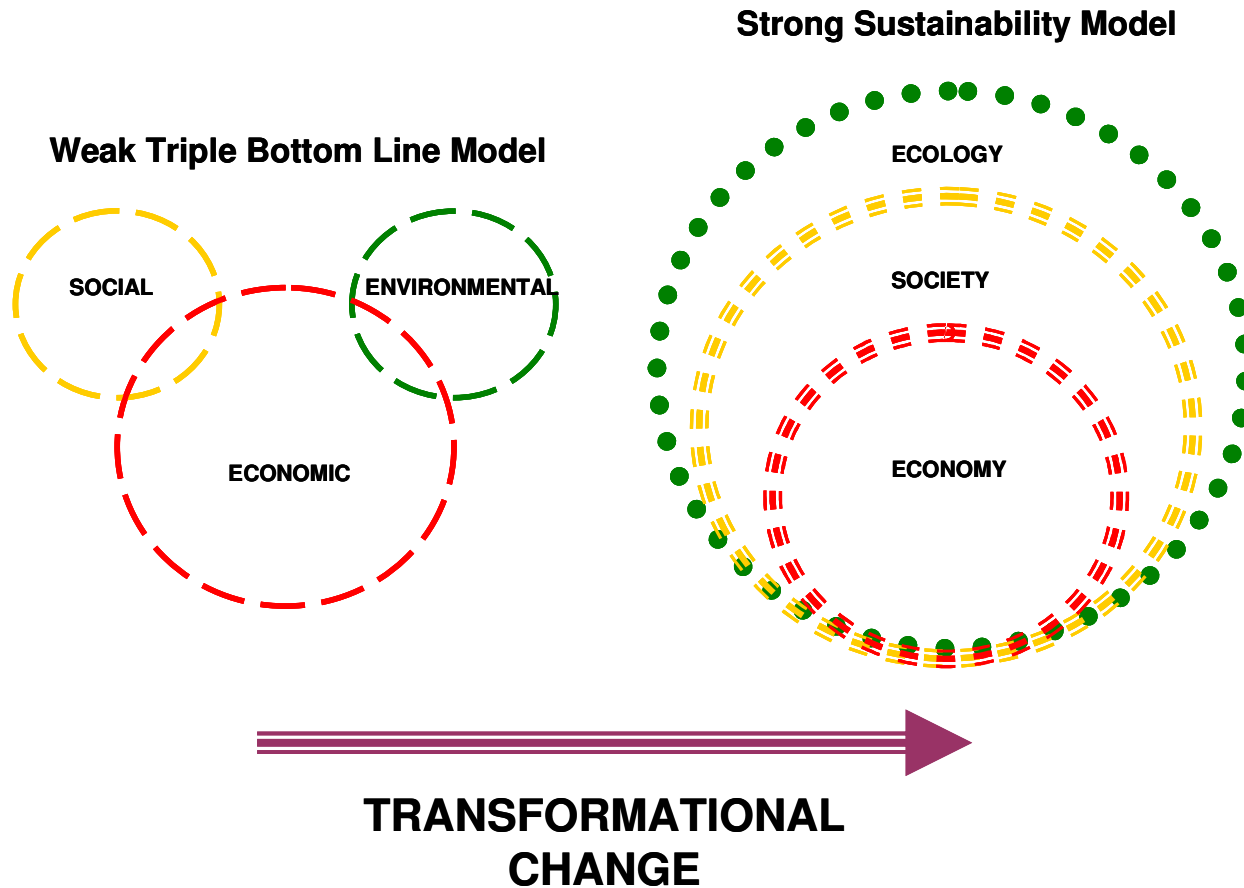
Managing change



Incremental change



Transformational change



Business as Usual approach



- Top down
- Wait & see (reactive)
- Weak 'triple bottom line' sustainability
- Impacts assessment
- Efficiency improvement
- Accommodation

Painting by Carrie Marill, courtesy of Jen Bekman gallery

Substitution approach



- Consultation
- Compliance/active
- Triple bottom line sustainability
- Vulnerability assessment
- Substitution
- Relocation

Painting by Carrie Marill, courtesy of Jen Bekman gallery

Redesign approach



- Participatory
- Proactive
- Strong sustainability
- Resilience building
- Redesign
- Recreate

Painting by Carrie Marill, courtesy of Jen Bekman gallery

Barriers to change

Top down	Consultation	Participatory
Wait & see (reactive)	Compliant/active	Proactive
Weak triple bottom line sustainability	Triple bottom line sustainability	Strong sustainability
Impacts assessment	Vulnerability assessment	Resilience building
Efficiency improvement	Substitution	Redesign
Accommodation	Relocation	Recreate

Some of the barriers

- Information overload
- The psychology of denial
- It's all bad news
- Let the politicians and scientists sort it out
- Resistance to change – fear of the unknown

A 'Business-As-Usual' approach will not provide lasting solutions



What does it take to change?



“On an island fighting for its future, the most visible reminder of the perils facing such an isolated and small nation is its rubbish.”

Toxic Tuvalu: Nowhere to go for mountain of rubbish 10/8/2010

<http://www.stuff.co.nz/world/south-pacific/4008961/Toxic-Tuvalu>

What does it take to change?



Isn't this a sacred place?

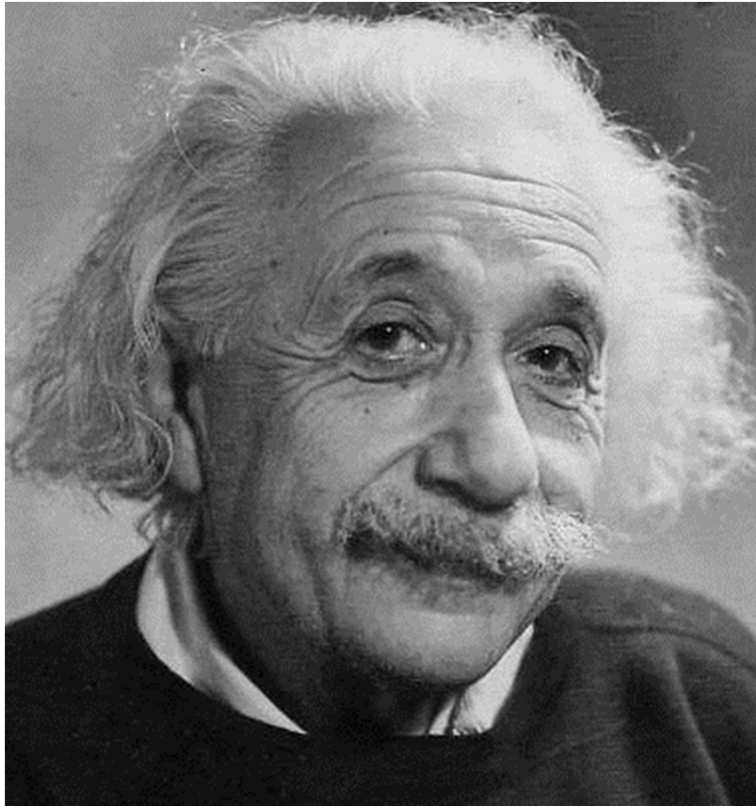


Do we need crisis to change?



Real change isn't motivated by either crisis or fear, but through leadership, vision and community.

A 'business as usual' response won't work



*"We cannot solve our problems
with the same thinking we used
when we created them. We shall
require a substantially new manner
of thinking if mankind is to survive."*

Albert Einstein

The psychology of change

Build on existing knowledge, capabilities and resources

Seven psychological principles that can help foster positive actions in addressing climate change:

- Promote success stories
- Provide positive future visions
- Focus on opportunity not risk
- Support social impulses
- Identity with place
- Fairness is vital
- Ownership of change/being heard



The importance of innovators

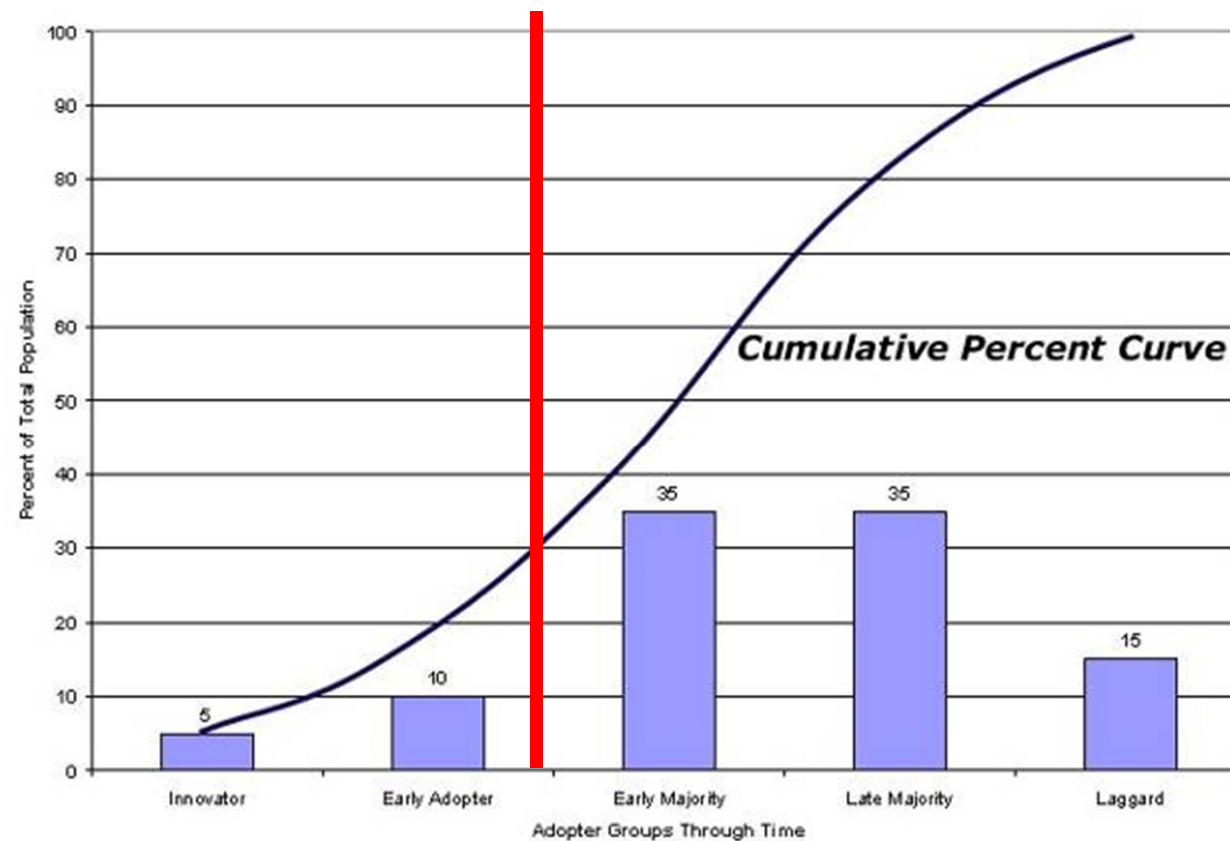
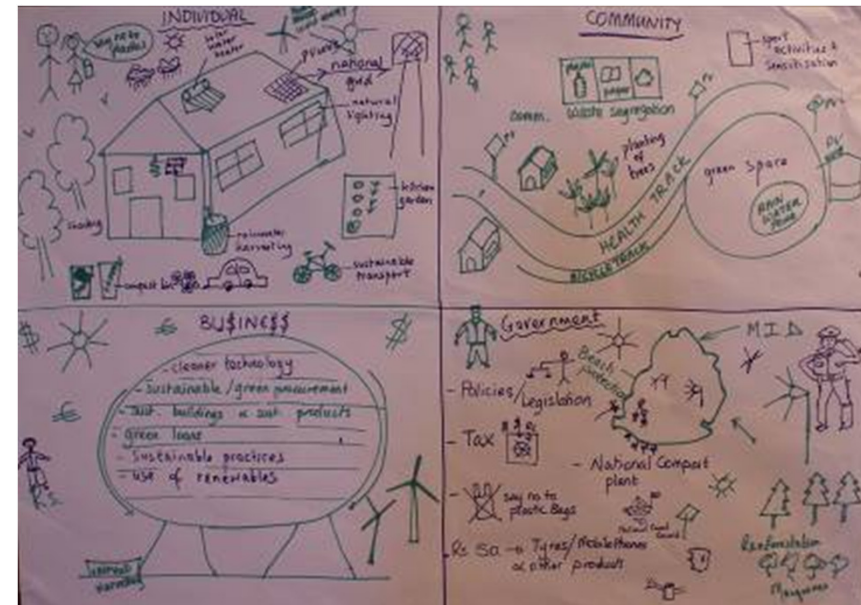
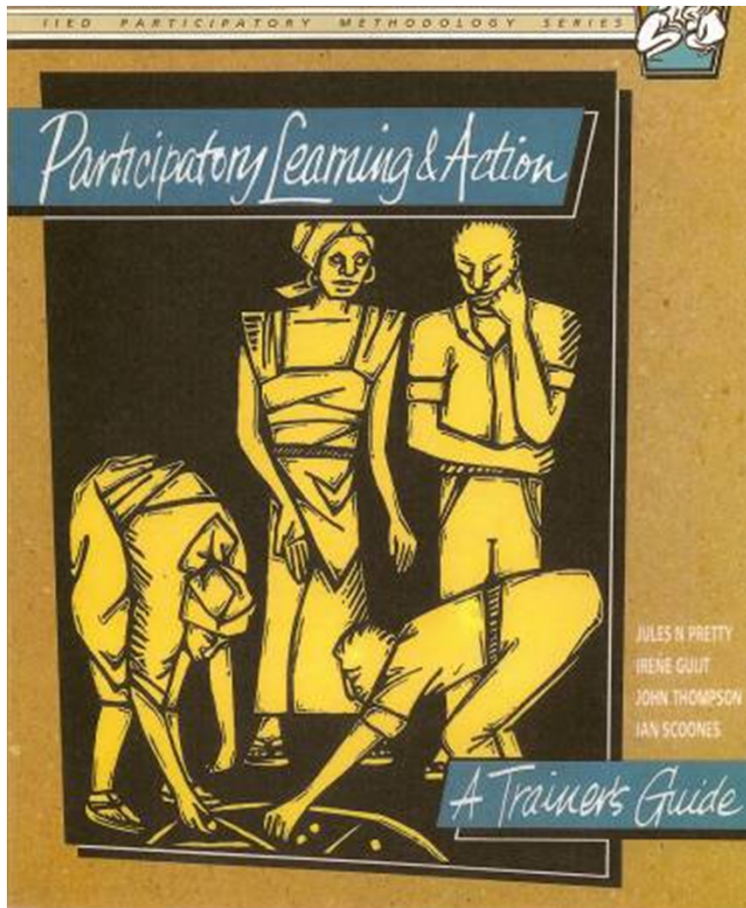


Figure 1. Percent Distribution of Diffusion Theory Adopter Groups

Participatory approaches



Participatory approaches

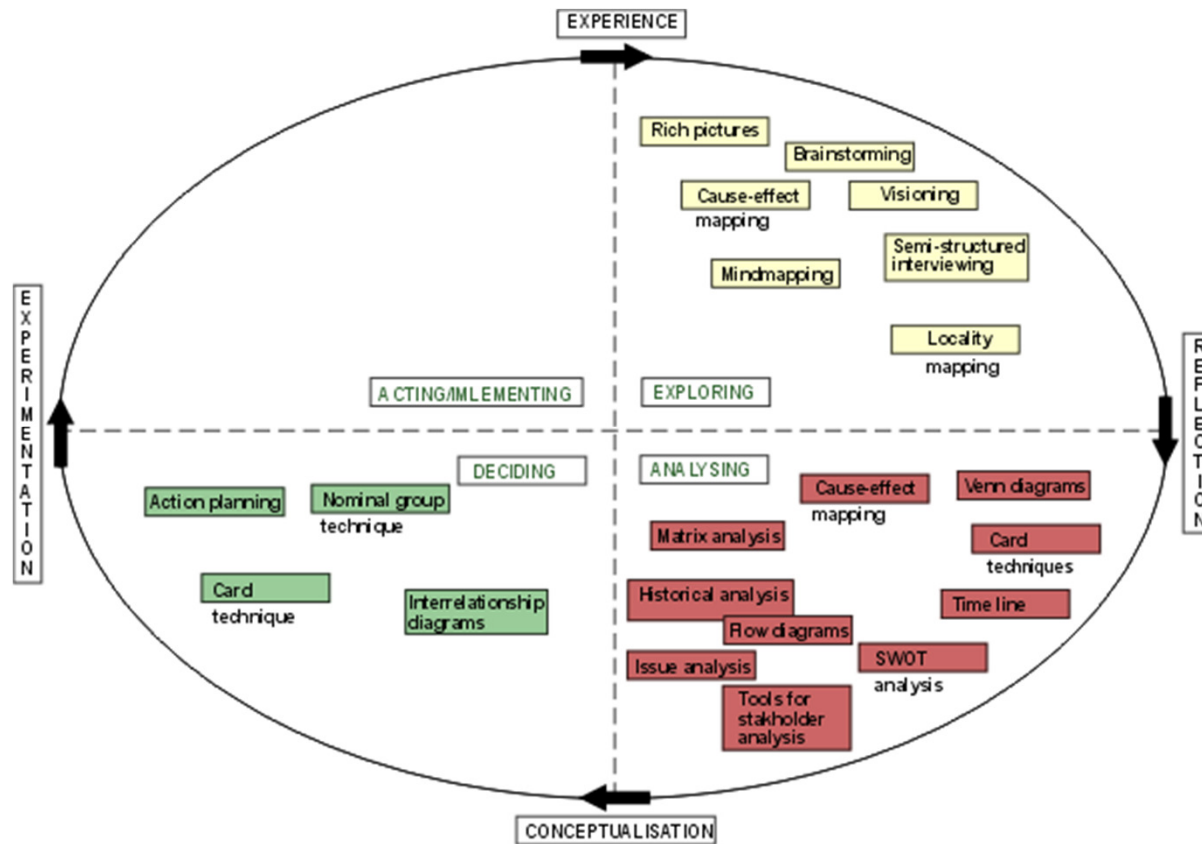


- Adults are voluntary learners
- Adults usually come with an intention to learn
- Adults have experience and can help each other to learn
- Adults learn best in an atmosphere of active involvement and participation
- Adults are best taught with a real-world approach

Integrating top down and bottom up approaches

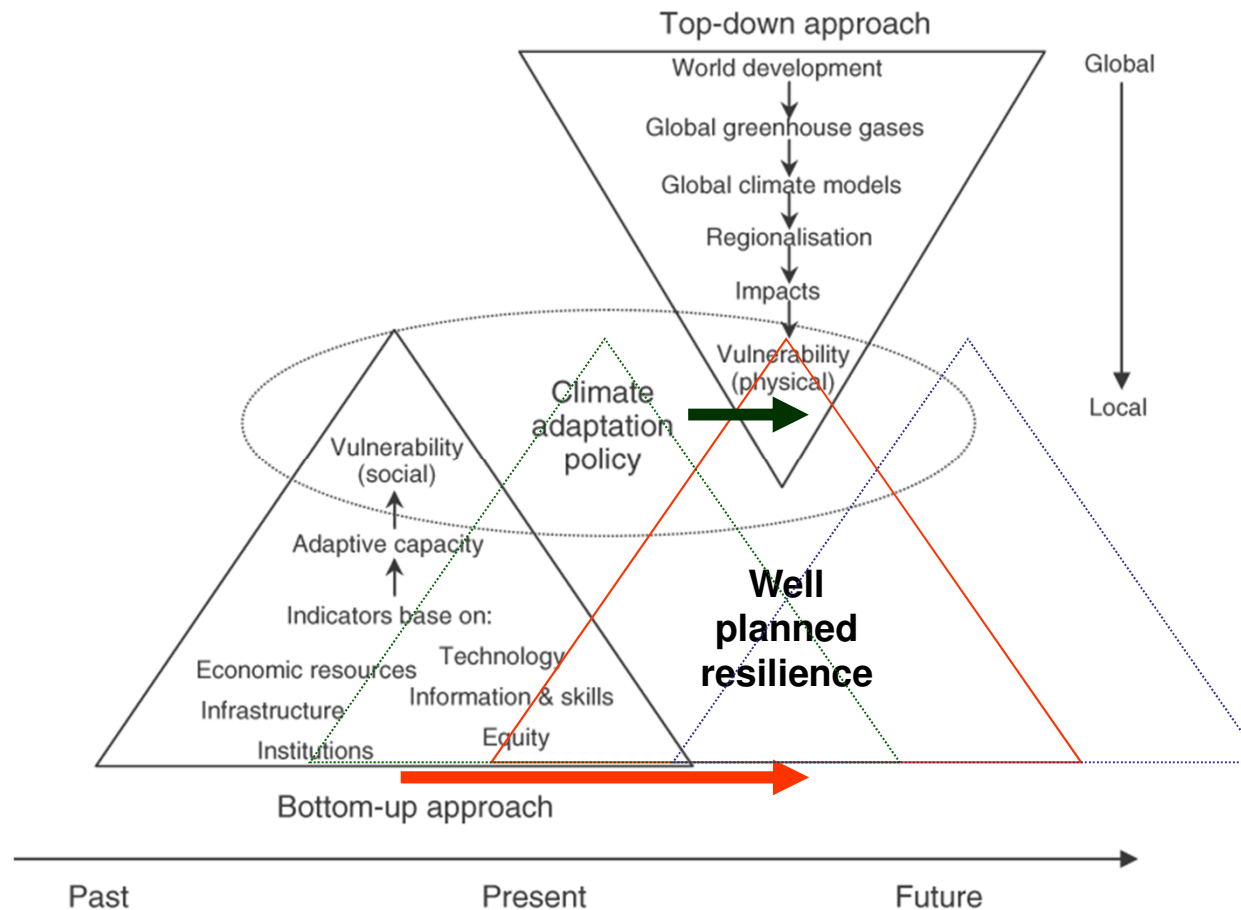


Multi-stakeholder (participatory) approaches



Source: <http://portals.wi.wur.nl/msp/?page=1211>

A resilience approach



Climate as a resource

What we can do locally

- **Some basic inputs**
 - Carbon
 - Water
 - Solar energy
- **It's how we manage these that matters**
 - *Fire and water are good servants
but bad masters (Aesop, 620–565 BC)*
 - *Fire, water and climate are good servants
but bad masters (Glantz, 2005)*



Developing response capacity

A climate for change

- **Leadership**
 - Make leaderfulness present throughout the community
- **Vision**
 - Design the community's preferred future
- **Community**
 - Organise networks and movements, identify and amplify the hubs of know-how, influence and coordination

From 'The shift is on to Craft Communities – in Organisations and Places' by Robert J. Leaver, www.newcommons.com



Every situation is different...

we need to work with that diversity



“Imagination is more important than knowledge. Knowledge is limited.”

Albert Einstein

Key points

- Future visioning is vital
- Resilience building – action focus
- The need to be more aware of the psychology of change
- Identify and engage with innovators whose actions are consistent with future vision
- Participatory approaches need to be fully understood and applied for an effective integrated approach

A climate resilient Mauritius?



- Coastal environment (including fisheries)
- Water resources
- Land management (agriculture, land use change, forestry)
- Health and well-being
- Biodiversity

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

