



THE AUSTRALIAN NATIONAL UNIVERSITY

*From policy to practice in climate change adaptation:
an examination of policy-driven adaptation in south-
east Australia and some consequences*

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- Topic brief:
 - ‘Economics and policy of climate change adaptation, applied to issues relevant in Australia’
- Phase one
 - Scoping with people in the know
- Phase two:
 - Going solo in the trenches

To explore the meaning of climate change adaptation (CCA) as articulated by:

- 1. The Literature**
- 2. By a selected government programme**
 - [Local Adaptation Pathways Program/Climate Change Action Pack/National Water Initiative]**
- 3. By implementers**

What does this do?

- 1. Explores relationship between CCA theory and practice**
- 2. Critical evaluation – who took/did not take policy incentives up and why**
- 3. Other important things...**

Local Adaptation Pathways Program (LAPP)

- ‘The Australian Government is providing funding to help councils undertake climate change **risk assessments** and develop action plans to prepare for the likely local impacts of climate change’.

Two funding rounds

- **Round one**
 - < 60 local governments, funding for 33 projects [1.5 million]
 - Coastal & urban areas
- **Round two**
 - 30 local governments, funding for 7 projects [\$874,000]
 - Rural remote areas – to complement and build on round one.

Guided by three Fed docs:

- AGO&DEH 2006 Climate Change Impacts & Risk Management: A Guide for Business and Government
- Climate Change Adaptation Actions for Local Government
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Case study approach – two regions

Comparative analysis of either:

- **Funded councils/projects**
- **Successful vs unsuccessful/didn't apply**
 - Who took up these incentives and why
 - Who didn't and why

Field methods

- Interviews
- Application of evaluation criteria – does one exist?

Drilling down into the LAPP

- **CC characterised as:**
 - *‘Climate will not be what is was’*
 - *‘Climate change will be pervasive and be felt in some way by every person’*
 - *‘Climate change might be gradual or abrupt’*
- **Technical specs.**
 - *Temperature will increase*
 - *Inland be hotter than coastal*
 - *Greater warming in spring and summer than winter*
 - *Rainfall to decrease in SE or NW Australia, increase in NW*
 - *Drier all-round*
 - *More extremes of everything*

Mapping climate change and risk

Figure 4: Links between climate change and risk

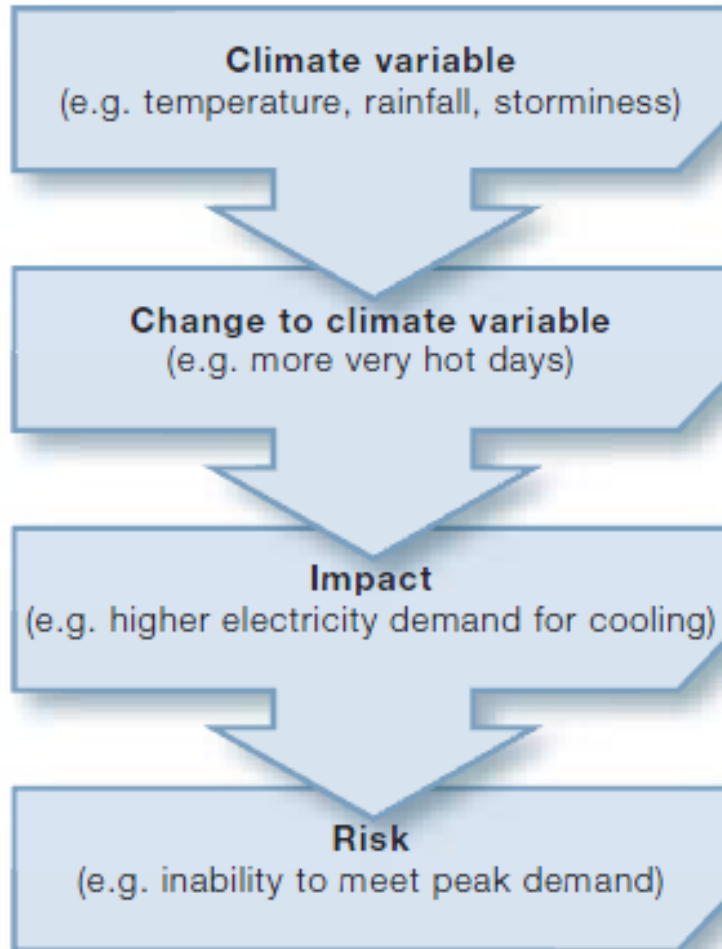


Table 2: Impacts associated with changes to climate variables

Change to climate variable	Examples of impacts
Higher mean temperatures	<ul style="list-style-type: none"> → Increased evaporation and decreased water balance. → Increased severity of droughts (see below). → Reduced alpine winter snow cover. → Reduced range of alpine ecosystems and species. → Increased stress to coral reefs.
Higher maximum temperatures, more hot days and more heat waves	<ul style="list-style-type: none"> → Increased incidence of death and serious illness, particularly in older age groups. → Increased heat stress in livestock and wildlife. → Increased risk of damage to some crops. → Increased forest fire danger (frequency and intensity). → Increased electric cooling demand and reduced energy supply reliability.
Higher minimum temperatures, fewer cold days and frost days	<ul style="list-style-type: none"> → Decreased cold-related human morbidity and mortality. → Decreased risk of damage to some crops and increased risk to others. → Extended range and activity of some pest and disease vectors. → Reduced heating energy demand.
Decrease in precipitation	<ul style="list-style-type: none"> → Decreased average runoff, streamflow. → Decreased water quality. → Decreased water resources. → Decrease in hydro-power potential. → Impacts on rivers and wetland ecosystems.
Increased severity of drought	<ul style="list-style-type: none"> → Decreased crop yields and rangeland productivity. → Increased damage to foundations caused by ground shrinkage. → Increased forest fire danger.
Decreased relative humidity	<ul style="list-style-type: none"> → Increased forest fire danger. → Increased comfort of living conditions at high temperatures.
More intense rain	<ul style="list-style-type: none"> → Increased flood, landslide and mudslide damage. → Increased flood runoff. → Increased soil erosion. → Increased pressure on disaster relief systems.
Increased intensity of cyclones and storms	<ul style="list-style-type: none"> → Increased risk to human lives and health. → Increased storm surge leading to coastal flooding, coastal erosion and damage to coastal infrastructure. → Increased damage to coastal ecosystems.
Increased mean sea level	<ul style="list-style-type: none"> → Salt water intrusion into ground water and coastal wetlands. → Increased coastal flooding (particularly when combined with storm surge).

- Identify what activities or assets are sensitive to CC
- Judge whether CC is a significant risk to these assets and activities **relative to other sources of risk.**
- Risk = combination of likelihood and the consequence of an occurrence.
- Assessment involves qualitative as well as quantitative assessment.

Figure 5: Steps in the risk management process

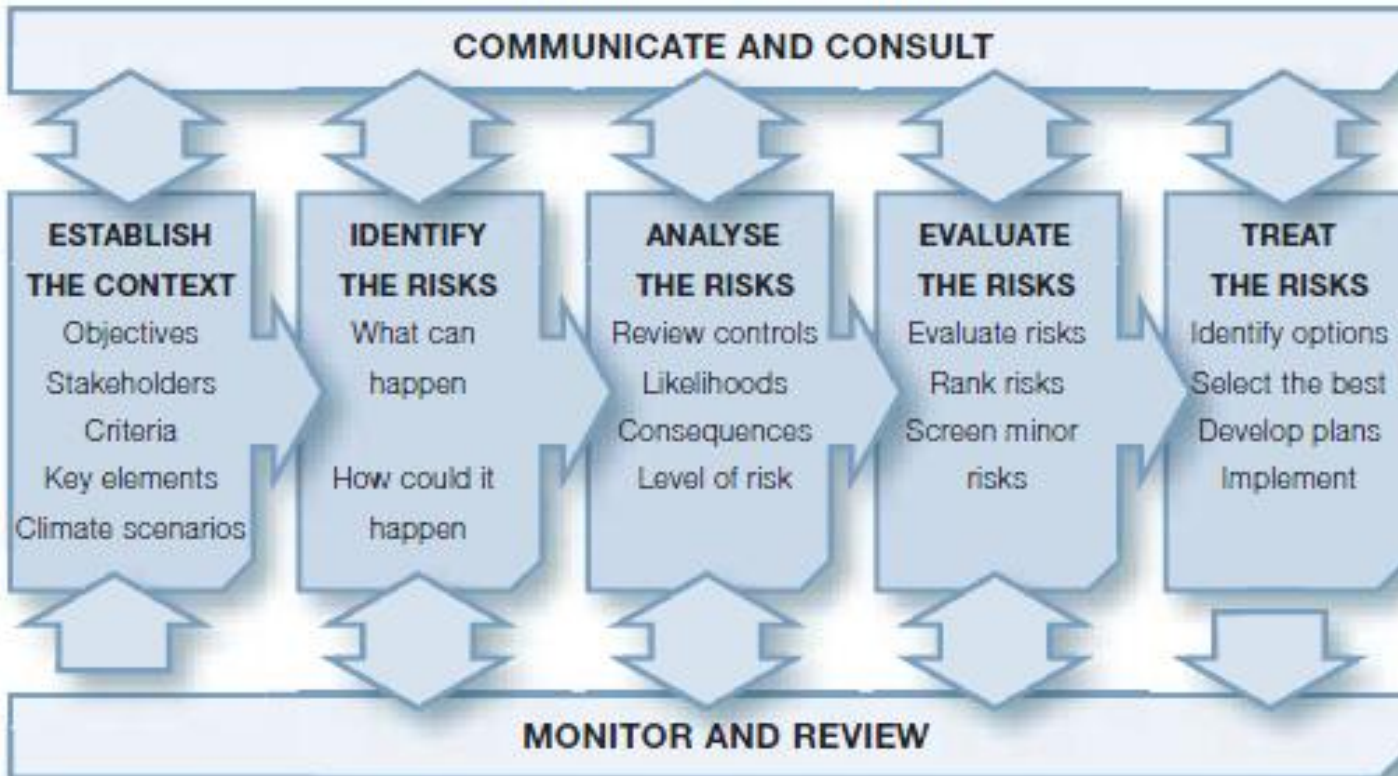
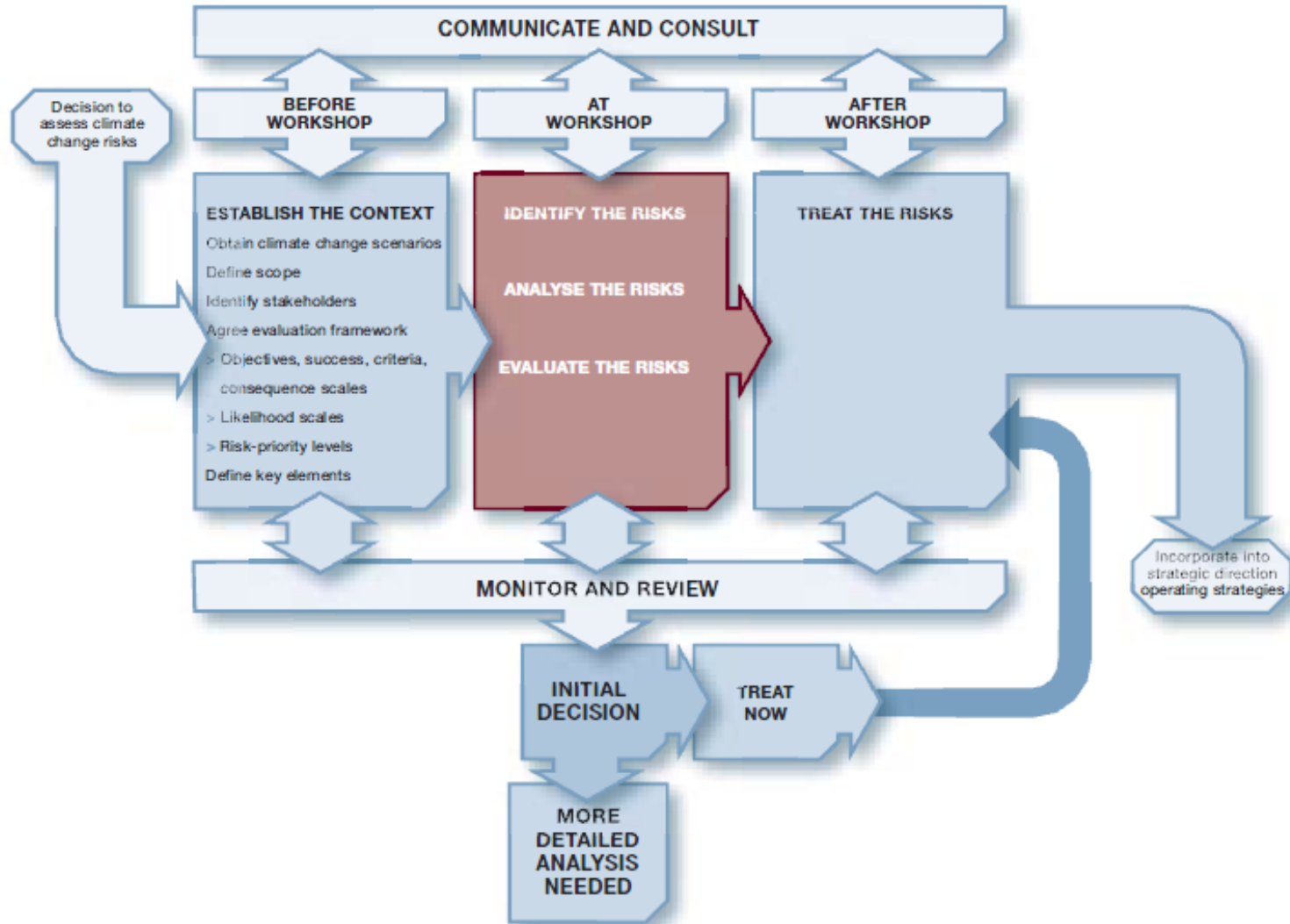


Figure 7: The initial assessment is centred on a workshop process



Scales of consequence

Table 8: Example – consequence scales for a local authority

Rating	SUCCESS CRITERIA				
	Public safety	Local economy & growth	Community & lifestyle	Environment & sustainability	Public administration
Catastrophic	Large numbers of serious injuries or loss of lives	Regional decline leading to widespread business failure, loss of employment and hardship	The region would be seen as very unattractive, moribund and unable to support its community	Major widespread loss of environmental amenity and progressive irrecoverable environmental damage	Public administration would fall into decay and cease to be effective
Major	Isolated instances of serious injuries or loss of lives	Regional stagnation such that businesses are unable to thrive and employment does not keep pace with population growth	Severe and widespread decline in services and quality of life within the community	Severe loss of environmental amenity and a danger of continuing environmental damage	Public administration would struggle to remain effective and would be seen to be in danger of failing completely
Moderate	Small numbers of injuries	Significant general reduction in economic performance relative to current forecasts	General appreciable decline in services	Isolated but significant instances of environmental damage that might be reversed with intensive efforts	Public administration would be under severe pressure on several fronts
Minor	Serious near misses or minor injuries	Individually significant but isolated areas of reduction in economic performance relative to current forecasts	Isolated but noticeable examples of decline in services	Minor instances of environmental damage that could be reversed	Isolated instances of public administration being under severe pressure
Insignificant	Appearance of a threat but no actual harm	Minor shortfall relative to current forecasts	There would be minor areas in which the region was unable to maintain its current services	No environmental damage	There would be minor instances of public administration being under more than usual stress but it could be managed

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..environmental amenity,
environmental damage...

Table 12: Priority (given that the scenario arises)

Likelihood	Consequences				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	Medium	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	High
Unlikely	Low	Low	Medium	Medium	Medium
Rare	Low	Low	Low	Low	Medium

Table 17: Examples – Climate change risk treatments

Treatment type	Description and examples
Spread risk	<p>Insurance and diversification strategies:</p> <ul style="list-style-type: none"> → Use of financial products that off-lay the risk → Geographical diversification
Structural and technological	<p>Prevent effects through engineering solutions and changed practices:</p> <ul style="list-style-type: none"> → Increase reservoir capacity → Implement energy demand management measures → Scale up coastal protection measures → Change design of storm-water systems → Build more resilient housing → Install more efficient irrigation systems → Create wildlife corridors
Regulatory and institutional	<p>Prevent or mitigate effects through revised regulations and planning:</p> <ul style="list-style-type: none"> → Adopt integrated planning approaches → Amend local planning schemes to give greater weight to flood risk → Revise guidance notes for urban planners → Amend building design standards → Increase resources for coastal planning → Factor climate change into criteria for designation of species or ecosystems requiring increased protection → Improved contingency and disaster planning → Lengthen strategic planning horizons (from say 5-10 years to 20-30 years)
Avoidance	<p>Avoid or exploit changes in risk:</p> <ul style="list-style-type: none"> → Grow new crops → Migration of people away from high risk areas → Change location of new housing developments → Improve forecasting systems to give advance warning of extreme climate events
Research	<p>Research to improve understanding of relationship between climate change and risk:</p> <ul style="list-style-type: none"> → Improve knowledge of relationship between past and present variations in climate and performance of economic, social and environmental systems → Improve modelling of regionally-based climate change impacts → Improve knowledge of the probability of frequency and magnitude of changes to extreme climate events and other climate variables under climate change → Improve understanding of the relationship between changes to frequency and magnitude of extreme events and critical thresholds for individual risks
Education, behavioural	<p>Educate and inform stakeholders about the risks of climate change:</p> <ul style="list-style-type: none"> → Increase public awareness about the potential impacts of climate change and about climate change adaptation measures → Educate and inform management and personnel about climate change risks and adaptation measures

■ Goals

- Suggested categories are financial economic matters, outputs, service or product delivery

■ Stakeholders

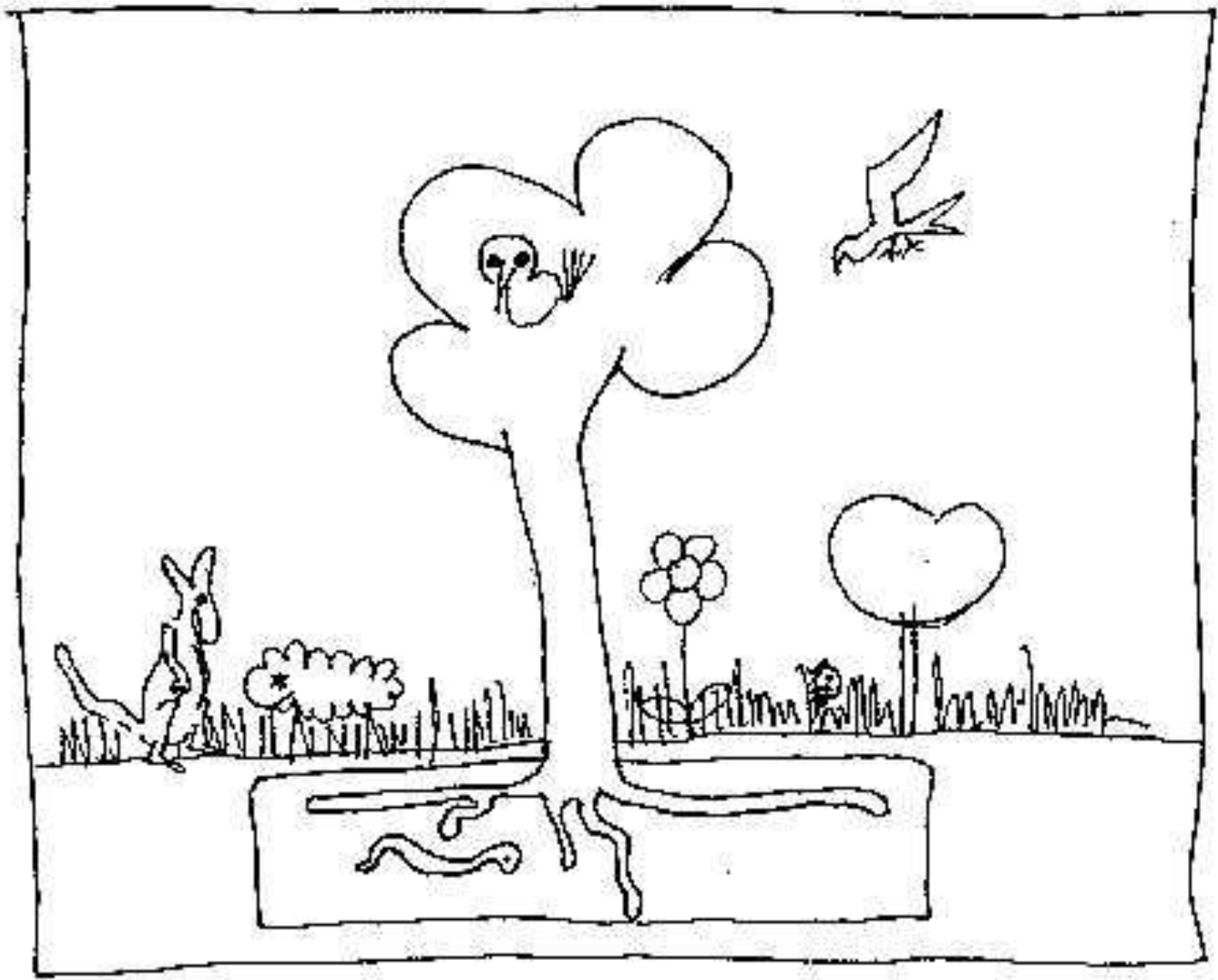
- ‘Who’s views **need** to be taken into account
- Who **can** contribute to the analysis
- Who **needs** to know its outcomes

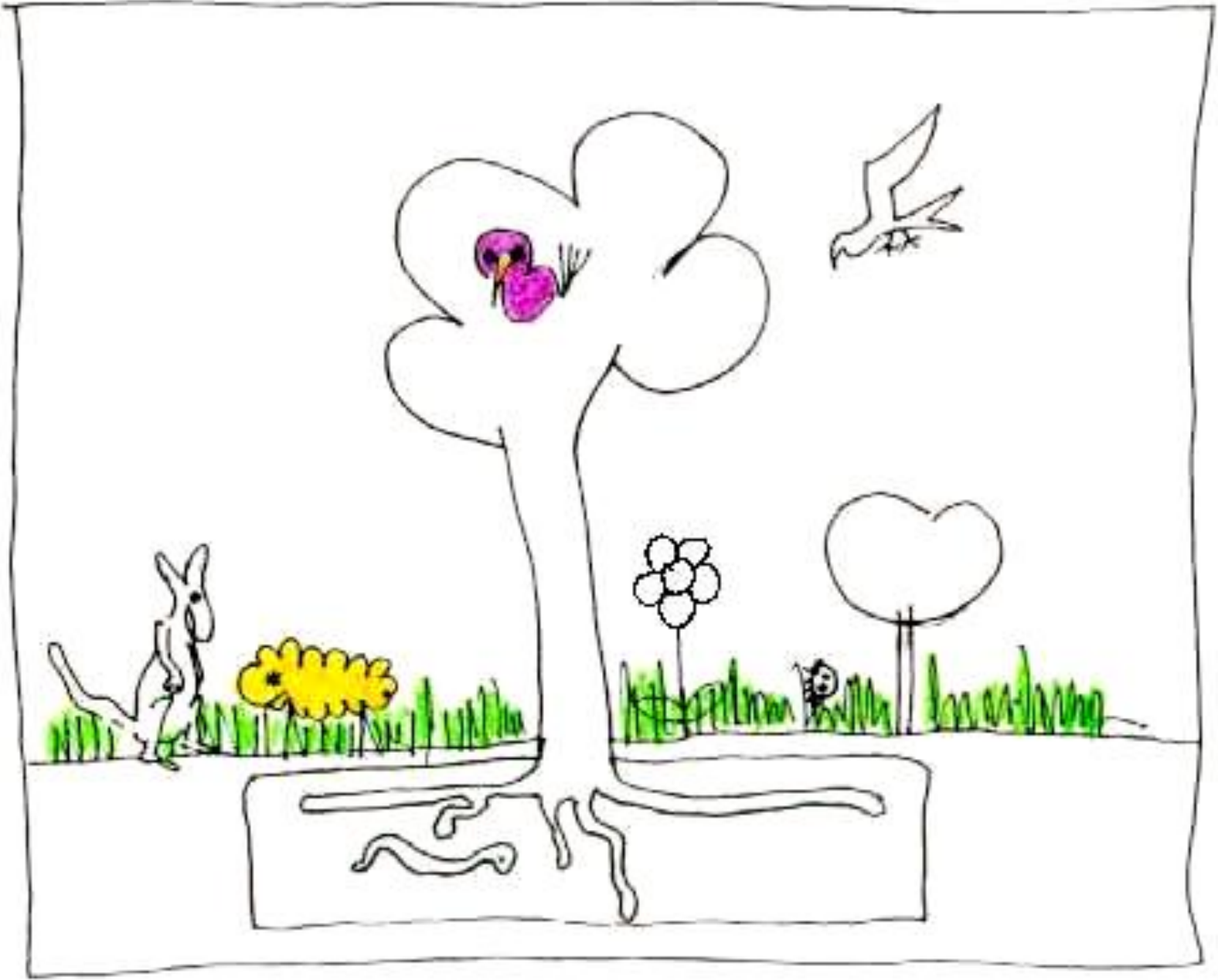
■ Key elements

- Good stuff here

■ CC scenarios

- Scenarios as plausible futures
- Ranking likelihood – some more likely to occur than others







Risk assessment – some first cut comments 2

- **More on stakeholders...**
 - **‘SHs are individuals, groups or organisations whom it is useful to take into account to achieve a successful outcome for your organisation’.**
- **Choice of team players for workshop**
 - **Climate change expert**
 - **Organisational owner of important functions or assets**
 - **Has authority to act on or sanction action on treatment requirements**
 - **Personnel administrator – smooth operation**

Risk treatment – some rules of the game

- **Don't over or under-adapt**
- **Address high priorities first**
- **Use adaptive management**
- **Look for win-win or no regrets**
- **Avoid adaptation constraining decisions**
- **Review and monitor**

Gardner, J, Dowd, A-M., Mason, C. and Ashworth, P. (2009). *A framework for stakeholder engagement on climate adaptation. CSIRO Climate Adaptation Flagship Working paper No.3.*

Engagement processes -

- **‘Address scepticism: Engage intensively with influential members of the community to combat scepticism regarding climate change. Recognise there is little probability that entrenched scepticism can be reversed, however it is important to provide messages that directly address the claims and arguments of sceptical individuals. Discussing the nature of scientific investigation, and discussing previous examples of both scepticism and overreaction brought about by past scientific work may be helpful ‘.**

- and further...
 - ‘CC and CCA have some features that make engagement... particularly problematic. These features include the presence of **misinformation** and scepticism about climate change, people’s typical reactions to uncertainty, and variations in the capacity for long-term planning, as well as other issues’.

- **Contact Department of Climate Change, NSW association of Councils, NSW DCC**
- **Contact local councils...**
- **...**
- **Case studies....where?**