Understanding rural landholder adaptation/responses to climate variability

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Understanding rural landholder adaptation/responses to climate variability

- Context
- The research problem
- Theoretical framework - ‘Risk’
- Previous work in the region
- Research proposal and methodology

Context

Environmental change

- Salinity & land degradation/soil loss
- Landscape/habitat fragmentation
- Introduced species/species loss
- Climate variability/change

Context

Social change

- Changing land uses/demographics
- Economic issues – terms of trade, competition
- Climate variability/change ??

Social impacts of ongoing drought, water regimes (physical and political), politics of drought and climate change….

Context

Ecosystem risk project

- linking climate change with terrestrial ecosystems
- terrestrial ecosystems also exist within a social environment – thus human and natural influences on terrestrial ecosystems
- importance of social research

The research problem

If we are seeking better management of natural resources in a climate change future, we need to understand:

- What is the range of landholder responses to current climate variability and future climate change?
- Why? What factors influence these responses?
- How can NRM agencies influence landholder decision making?

Theoretical framework
The social construction of risk

An assessment of risks related to adopting a particular action sits at the heart of the decision making process.

Intuitive process to identify risks associated with an option and evaluate the consequences of taking that risk.

Risk is fundamentally about dealing with uncertainty.

Theoretical framework
The social construction of risk

The intuitive approach to risk analysis may consider different elements:

- **Probability** – likelihood of an undesirable occurrence.
- **Consequence** – type, magnitude and duration of undesirable outcome. What do I stand to lose?
- **Benefit** – cost-benefit analysis, potential/expected gain.

Theoretical framework
The social construction of risk

Risk has often been considered as a combination of:

- the **probability** of an event occurring; combined with
- the magnitude of the **Consequences**.

These elements have been combined as key components of formal risk management processes in organisations.

Risk scoring

consequence		2. What is the likelihood of the risk occurring? *probability*			
1.	**What is the severity of the outcome for this type of risk?**	**Very likely** Could happen any time	**Likely** Could happen sometime ✓	**Unlikely** Could happen, but very rarely	**Very unlikely** Could happen, but probably never will
	Kill or cause permanent disability	**Very High Risk**	**Very High Risk**	**High Risk**	**Substantial Risk**
✓	**Long term illness or serious injury**	**Very High Risk**	**High Risk** ✓	**Substantial Risk**	**Moderate Risk**
	Medical attention and several days off work	**High Risk**	**Substantial Risk**	**Moderate Risk**	**Acceptable Risk**
	First Aid needed	**Substantial Risk**	**Moderate Risk**	**Acceptable Risk**	**Low Risk**

The social construction of risk

But we know that different people perceive risk differently.

We also know that risk is often perceived differently by 'experts' and the general public. E.g. risk rankings:

	Public	Expert
Nuclear power	**1**	**20**
Motor vehicles	**2**	**1**
Smoking	**4**	**2**
Alcohol	**6**	**3**
Police work	**8**	**17**
Surgery	**10**	**5**
Fire fighting	**11**	**18**
Mountain climbing	**15**	**29**
X-rays	**22**	**7**

The social construction of risk

Slovic identified two main factors that explain differences in risk perception:

- **dread** – characterised by fear, uncontrollable, not easily reduced or risk increasing, globally catastrophic, fatal consequences, inequitable, risk to future generations, involuntary;

- **unfamiliarity** – unknown to those exposed, unknown to science, new, not observable, delayed.

The social construction of risk

Important factors in understanding how people perceive risk:

- **characteristics of the risk itself** – different types of risk generate different reactions. Voluntary risks are deemed less risky than involuntary ones. New risks (unknown) are viewed differently from familiar (known) ones.

- **psychological aspects of decision-making.** Activities with demonstrable benefits can facilitate greater receptivity to risk. An event is considered more probable if its occurrence can be readily recalled or imagined.

The social construction of risk

Important factors in understanding how people perceive risk:

• **psychological research** has also identified factors that may aid ability to respond positively to external threats or sources of stress:

• adaptability;

• being able to set goals and progress towards them;

• viewing the world as comprehensible, manageable and meaningful;

• having strong social networks.

The social construction of risk

Important factors in understanding how people perceive risk (cont.):

- The general public often focuses on unknown effects of risk, on significantly negative consequences regardless of probability, or on what the 'experts' do NOT know and why they cannot agree.

The social construction of risk

Important factors in understanding how people perceive risk (cont.):

- **All people use speculative frameworks** to make sense of the world and selective judgements in their responses to risk. In other words, there is no such thing as a rational and objective quantitative assessment of risk. Probabilistic risk assessments include subjective components and assumptions with inputs based on judgements.

These 'non-rational' factors partly explain differences in perceptions of risk between 'experts' and the public, and why 'expert' or science-based communication often fails to convince the public.

The social construction of risk

Important factors in understanding how people perceive risk (cont.):

Trust is a key factor in influencing risk perception:

- acceptance of risk depends on confidence in risk management – this depends on trust in the people or agency responsible for management.

- information from trusted sources is given more credence than from untrusted sources. Thus, the effectiveness of risk communication depends on trust in the source of the communication.

Previous research in the region

Climate change impacts and adaptation in North Central Victoria: Landholders' perceptions.

Research project undertaken by the Institute for Land, Water and Society for North Central CMA in late 2005 – early 2006.

Sought to **provide an understanding of landholder perceptions of climate change and thoughts regarding the adaptation strategies that climate change may require**.

Previous research in the region

Research objectives – to investigate perceptions of:

- local weather and climate cycles – and change;
- phenomenon of climate change;
- effect of CC on landholder enterprise and farming viability;
- potential adaptation actions; and
- actions being considered or implemented on property.

Previous research in the region

Findings:

- 'climate' limitations considered in terms of rainfall, so 'global warming' has little meaning;
- all have experience and understanding of climate variability, but generally low awareness and confusion over climate change and its impacts;
- lack of relevant data (from local region) to allow analysis of clear trend;
- Range of attitudes from sceptics to believers, mostly "I don't believe in it" or "wait and see".

Previous research in the region

Findings:

- climate change is a political issue – has been politicised which has influenced dissemination and discussion of information;
- competing political agendas has also influenced acceptance of information – acceptance or rejection of CC seen as sign of political allegiance;
- communication about CC and its impacts has been unsuccessful.

Previous research in the region

Findings:

- scepticism/uncertainty about climate change results in uncertainty about how it may effect enterprise activities and viability in the future.
- some believe it will have little effect. Focus on drought, and past experience of variability and adaptation, rather than any long term change – other concerns more important for viability.

Previous research in the region

Findings:

- some believe CC will affect their enterprise, but effects considered largely in terms of rainfall.
- some confidence in society's ability to generate technologies to support mitigation and adaptation, and confident in their own capacity to adapt.

Previous research in the region

Findings:

- general feeling that they are not getting the information they need to make decisions on CC. Need info that is more relevant to enterprise and specific to local area, not "two degree warming across SE Australia".
- most common source of info is general media – TV, radio and newspapers.
- but info is often contradictory, even from same source, e.g. *Weekly Times*.
- Trust was an issue in acceptance of information, relevant to all sources including technical advice.

Previous research in the region

Summary:

a relatively small project - limited in scope and scale, but with some interesting findings that raise further questions about:

- landholder awareness of and preparedness for climate change;
- the differences in the way people think and respond to situations and information;
- the delivery of information (local relevance, style and source) and thus future CC communication approaches.

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Some assumptions to start with:

- farming is inherently a risky business and farmers/landholders assess risk as part of the decision making process;
- climate variability has always been a part of life for farmers;
- there will be a range of adaptation responses to climate variability;

Understanding rural landholder adaptation/responses to climate variability

Some assumptions to start with:

- landholders make their own decisions regarding land management practices, including responses to climate variability and change;
- there will be a complex web of factors shaping responses and accounting for individual differences in responses, but these include availability of credible information from trustworthy sources, and the policy environment in which they operate;

Understanding rural landholder adaptation/responses to climate variability

Some assumptions to start with:

- NRM agencies can influence landholder decisions in a number of ways, including:
  - ➢ delivery of information;
  - ➢ establishment and implementation of policies and programs that stimulate and support 'desired' outcomes.

Key research objectives

1. Describe the extent of adaptation (range of responses) by private rural landholders to climate variability.
2. Explore the factors influencing landholder responses to climate variability to understand the decisions made.
3. Use these understandings of landholder responses to provide for better informed decision making by landholders.
4. Use these understandings of landholder responses to assist agencies to better design strategies to influence landholder responses.

Proposed research questions

1. At the property scale, what is the range of responses to climate variability?
2. Are these responses consistent with individuals' goals and values? If not, why not?
3. To what extent are adaptations by private landholders consistent with NRM practices recommended by agencies?
4. How important is climate variability as a factor contributing to enterprise/land management decisions?

Methodology

Case study approach

Case studies identified in collaboration with ecological modelling group

Two case study sites identified that are different in:
- rainfall
- terrain, relief
- proportion of landscape with remnant vegetation
- land parcel size
- proportion of on-farm income

Methodology

Case studies will be undertaken at a **sub-catchment level.**

- Ensures large proportion of landholders interviewed.
- Ensures diversity of landholder types, e.g. farmer/non farmer, different types of enterprise, Landcare/non etc.
- Provides understanding of specifics of social setting, e.g. social and economic structure, networks and relationships, norms etc.

Methodology

Approach is for **semi-structured interviews** with landholders, providing an opportunity for detailed exploration of individual perspectives, personal values, adaptation responses and influencing factors.

The data gathered from these interviews is largely **qualitative** in nature, the analysis of which allows for the in-depth understanding sought in this research.

Up to 20 interviews in each case study area.

Methodology

During the interviews, it is proposed that small structured surveys also be applied. These will use closed-ended questions to gather background info on social and farming variables:

-age;
-occupation;
-length of residence;
-property size;
-involvement in Landcare
-off property work
-enterprise mix

Research will be completed in first half of 2008.

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Questions?

What can we do?

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Form 9:

HAZARD SCALE

Version: 1.4
18 February 2005

Next Form Review:
February 2006

1. How severely could it hurt someone? or How ill could it make someone?		2. How likely is it to be that bad? ++ Very likely Could happen any time	+ Likely Could happen sometime	- Unlikely Could happen, but very rarely	-- Very unlikely Could happen, but probably never will
!!!!	Kill or cause permanent disability	S	S	P1	P2
!!!	Long term Illness or serious injury	S	P1	P2	P3
!!	Medical attention and several days off work	P1	P2	P3	P4
!	First Aid needed	P2	P3	P4	P5

- **What is a hazard?**
  AS4804 defines a hazard as “a source or a situation with a potential for harm in terms of human injury or ill health, damage to property, damage to the environment, or a combination of these”. Hazards in the workplace may arise from the workplace environment, the use of plant and substances, poor work design, inappropriate management systems and procedures, or human behaviour.
- **What is a risk?**
  AS4808 defines a risk as “the combination of the frequency, or probability of occurrence, and consequence of a specified hazardous event”. Where frequency of exposure is an issue then duration of exposure is also considered. Risk is the level to which a hazard poses a threat to life, limb or property. This will vary from a minor laceration to a permanent disability, an illness such as cancer, or death.