

# Key Findings:

## The nature and utility of adaptive capacity research

### Introduction

This project was undertaken as part of NCCARF's Synthesis and Integrative Research program by Tim Smith and team from the University of the Sunshine Coast. It:

- considered the interpretation and approach to adaptive capacity research in different disciplines
- provided a critique of case studies of adaptive capacity assessments; and
- assessed the utility of the concept of adaptive capacity to researchers and decision makers, and made recommendations to improve synergies between them.

The work was undertaken by literature review, online survey, and key informant interviews.



### What do we mean by 'adaptive capacity'?

Adaptive capacity is a key determinant of the vulnerability of human and natural communities to the adverse impacts of climate change. The capacity to adapt to new conditions will be important in reducing the harmful impacts associated with climate change. Essentially, adaptive capacity relates to the feasibility of being able to actually implement adaptation actions.

The Fourth Assessment Report of the Intergovernmental Panel on Climate Change defined adaptive capacity as:

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 consequences.

A survey of researchers from a range of disciplines showed little difference in how they conceptualised adaptive capacity. Most disciplines saw adaptive capacity as focused on

people: that is, addressing social vulnerability. For some biological sciences, the term was associated with a 'systems' view focused on addressing the social and environmental dimensions of vulnerability.

A literature review identified an expectation that the concept of adaptive capacity will benefit in the future by a shift away from the "human" focus to a more holistic, systems view. This shift towards a socio-ecological idea of adaptive capacity is largely driven by thinking about resilience and has the potential to change our understanding of adaptive capacity.

### How can adaptive capacity be assessed?

Adaptive capacity is necessary for the implementation of successful adaptation strategies and enables communities to take advantage of any opportunities from climate change. Measuring or quantifying adaptive capacity remains difficult, and attempts to do so have varied in their approaches. Some generic assessments of adaptive capacity include indicators such as wealth and education; however, determinants of adaptive capacity depend on the social and environmental contexts in which adaptation occurs.

'Adaptive capacity is the ability to adjust to climate change, moderate potential damages, take advantage of opportunities, or cope with consequences'

### What methods are used in adaptive capacity research?

The review of published studies undertaken in this project, as well as the responses of surveyed researchers, show that methods of adaptive capacity research had undergone a shift over time. While early approaches focused on a single discipline (e.g. economics) and tended to be directed by researchers at practitioners, recent studies use a multi-disciplinary approach (e.g. socio-economic and biophysical) through participatory research involving practitioners and stakeholders. Recognition is emerging of the need for methods that take into account the unique contexts in which adaptation occurs, such as the political setting, and the relationships between adaptive capacity determinants (e.g. how wealth and education affect social capital in different places).

### What determines the adaptive capacity of an individual or community?

In identifying key determinants of adaptive capacity, early research focused on generic determinants such as income and education. Growing evidence has highlighted that the context of an individual or community (i.e. issues related to scale and place such as local environmental conditions and regional economic conditions) has important implications for adaptive capacity. There have been few empirical studies

(experimental or observational) of the determinants of adaptive capacity, and almost no study of the inter-relationships between the determinants of adaptive capacity (Figure 1.)

### Is the concept of adaptive capacity useful to decision makers?

The literature review identified three areas in which the concept of adaptive capacity is or could be useful to decision makers:

1. *Adaptive capacity research has enhanced the knowledge base of decision makers for effectively devising policy, and for planning and implementing adaptation strategies.* Over 65% of decision makers surveyed stated that the concept of adaptive capacity is useful in directing their programs. There was identification of scope to improve the usefulness of the adaptive capacity concept for example, by reaching a deeper understanding of determinants.
2. *Multi-disciplinary methods are needed to better understand the adaptive capacity of a community or sector.* The literature review identified the need for more innovative approaches to better understanding and contextualising adaptive capacity and for more collaboration between researchers from different disciplines.
3. *The context of decision making (e.g. scale or culture) and the level of uncertainty involved (e.g. an area with an extensive need for environmental information) determine the utility of adaptive capacity for decision makers and any barriers to applying the concept.* Adaptation planning cannot develop in isolation from considerations of adaptive capacity.

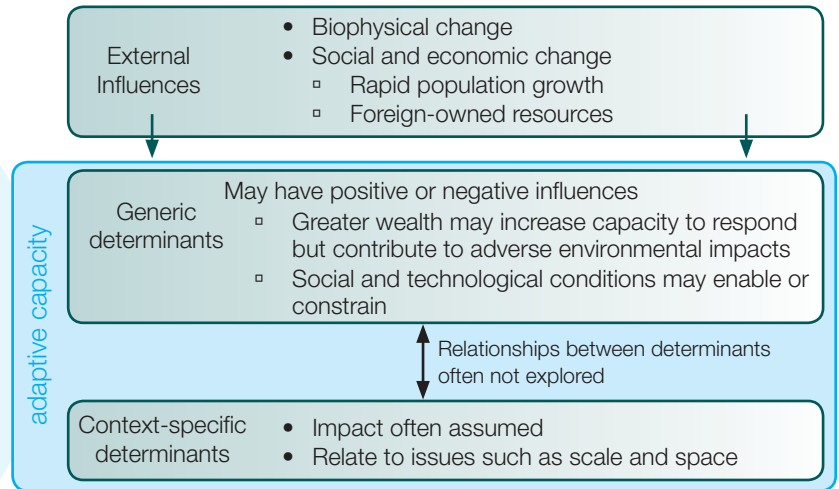
### How could the understanding of adaptive capacity be improved among stakeholders?

Although only a limited number of empirical studies have investigated adaptive capacity, the theoretical discussion of the concept is rapidly evolving.

More work could be done to monitor and evaluate the effectiveness of adaptive capacity interventions to improve understanding of adaptive capacity and of how it can be strengthened. Almost three-quarters of decision makers surveyed thought there should be more effective ways of building their organisation's capacity to adapt and improve resilience to climate change impacts. These results provide strong evidence of ongoing demand for building internal adaptive capacity within management and policy organisations.

Decision makers might improve the effectiveness of adaptive capacity building strategies and actions by:

- Monitoring performance – agree with stakeholders on easily measured indicators of adaptive capacity
- Learning by doing together – adaptation research should be iterative and collaborative
- Planning for complexity, not control – by focussing on good governance, adaptive capacity improves
- Fostering futures-oriented thinking – decision making in the context of uncertainty and the complexity of adaptive capacity can be improved by alternative thinking



**Figure 1. Factors that determine adaptive capacity**

- Rethinking, redesigning, rebuilding institutional models – with a focus on building learning organisations
- Promoting diverse adaptation pathways, actions and participation – valuing cultural diversity and other ways of ‘knowing’ (e.g. traditional knowledge)
- Understanding adaptive limits, institutional barriers and knowledge gaps – build the capacity of decision and policy makers and public trust
- Collecting and communication meaningful information. Good communication skills are important to build awareness of climate change risks, impacts and opportunities.

### Future adaptive capacity research

The over-riding message is that ‘one-size fits all’ generic approaches to adaptation planning are unlikely to be effective due to the context-dependent nature of adaptive capacity. Areas of further research include:

- Further development to support decision making:
  - robust feasibility and evaluation protocols for adaptation and adaptive capacity; and,
  - tools for adaptation action plans, policies and measures (to build analysis of adaptive capacity into adaptation option assessments)
- Better understanding of the relationships between values, attitudes and behaviours in the context of understanding adaptive capacity
- Increased focus on action research (active stakeholder participation in the planning, design, implementation and monitoring of adaptation projects)
- Adoption of a systems (holistic) approach to understanding the inter-relationships between the various determinants of adaptive capacity
- Better understanding of the barriers to increasing adaptive capacity
- Identifying vulnerability to climate change across different scales
- Understanding individuals’ different adaptive capacities
- Understanding the adaptive capacity of ecological systems and how to avoid thresholds or tipping points.