

Executive Summary

Introduction

This document summarises the outcomes of a review of climate change adaptation literature addressing social, economic and institutional dimensions. The review was conducted to inform planning activities for the revised SEI NARP. The review sought to explore contributions to adaptation research since the original SEI NARP was produced in 2011. The SEI NARP 2011 was structured around three research themes: (i) vulnerability and adaptive capacity; (ii) barriers and limits to adaptation; and (iii) governance. Under each theme, the NARP contained research topics (as opposed to research questions). Of the sixteen research topics, nine were deemed high priority (Table 1). This review sought to determine the extent to which the research topics had been addressed in adaptation literature (with a predominant focus on Australian research) and by projects initiated by the National Climate Change Adaptation Research Facility, since publication of the original SEI NARP in 2011. The results presented here: (i) provide a short introduction to each research theme; (ii) present the recommendations for the high priority research topics; (iii) provide rationale for recommendations within each theme; and present the results for low priority research topics. Additional information from the review (including the literature review findings which informed the knowledge gaps) is available in the accompanying report.

Table 1 NCCARF SEI Research Topics 2011 NARP

Theme	Research topics	High Priority (Y/N)
1. Vulnerability and adaptive capacity	1. Development and application of methods for assessing vulnerability and adaptive capacity that engage and harness knowledge and skills of individuals, households, communities, business, industries and governments (referred to herein as 'stakeholders')	Yes
	2. Understanding how interacting biophysical, economic, social, cultural and institutional processes, operating at various scales, expose stakeholders to climate risks, and identify options to reduce vulnerability.	No
	3. Understanding how interacting biophysical, economic, social, cultural and institutional processes and systems, operating at various scales, make stakeholders sensitive to climate risks, and identify options to reduce their sensitivity to climate change.	No
	4. Information of capacity of stakeholders to adapt to climate change and options to enhance capacity	Yes
	5. Understanding the equity dimensions of current and future vulnerability and adaptation, including: issues for specific population groups within limited capacity and understanding interaction between climate change, existing stressors and implications for vulnerability and adaptive capacity	Yes
2. Barriers and limits to adaptation	6. Understanding the cognitive and affective dimensions of adaptation including: knowledge, perceptions and emotional responses to climate risks (of people and groups), the time horizons of adaptation decision-makers, the degree of perceived empowerment to adapt.	Yes
	7. Understanding enablers and barriers to collective action, including: how the following enable or constrain adaptation (i) beliefs and practices; (ii) economic factors (e.g. distribution of capital and investment, (iii) social practices and opportunities (iv) the distribution of power in decision-making; what decision makers consider are the goals of adapt; what and how different decision-makers know about vulnerability of others.	Yes
	8. Understanding limits to adaptation (including what is valued, effectiveness of actions to sustain values, consequences of loss to values)	No
	9. Measures to value adaptation, including value of opportunity costs, avoided damages, residual impacts, benefits gained.	Yes
	10. Valuing adaptation, including the value of opportunity costs, avoided damages, residual impacts, and benefits gained, and comparing these across different sectors, places, and social groups.	No
3. Governance	11. Analysis of existing responses from public and private institutions to climate risks and assessment of proposals to increase EEE of future responses including: analysis of responses in public, private and civil society sectors; and analysis of distribution roles, responsibilities and capacities of different levels of government and cross-jurisdictional bodies.	Yes
	12. Understand how laws and legal institutions including regulation instruments, support of impede adapt planning and practice, identifying reforms needed	Yes
	13. Understanding the factors that facilitate or impede inclusion or integration of climate adaptation considerations and priorities into policy and planning; and understanding what kinds of advice and measures need to be incorporated into planning processes to ensure that plans and policies incorporate climate change adaptation.	No

	14. Assess potential for and limits to market based adaptation measures including insurance markets	Yes
	15. Identifying frameworks and approaches to manage transformations under climate change, including learning from non-climate change related experiences.	No
	16. Tools to support decision-making: (i) Developing adaptation decision support and evaluation tools and resources that include diverse values and preferences; (ii) Comparative analysis and evaluation of different criteria and decision-making frameworks for prioritising adaptation actions; (iii) The design and evaluation of research organisations, cultures and practice to support adaptation throughout society	No

Approach

A systematic review of peer-reviewed literature and NCCARF research outputs was undertaken. The systematic review focused primarily on Australian research, supplemented by international literature. See full report for details.

Results

Theme 1 Understanding vulnerability and adaptive capacity

Introduction

This theme concerned research that conceptualizes and assesses vulnerability and adaptive capacity in ways that facilitate adaptation throughout society. It called for bottom-up and stakeholder-driven processes to understand vulnerability and adaptive capacity.

High priority topic recommendations

Topic	Knowledge gaps	Recommendation
Topic 1. The development and application of methods for assessing vulnerability and adaptive capacity that engage and harness the knowledge and skills of individuals, households, communities, businesses, industries and governments”	<ul style="list-style-type: none"> The value of research engaging stakeholders in vulnerability and adaptation research was highlighted; however, community level engagement predominantly entailed the collection of data via survey questionnaire or interviews to assess vulnerability and/or capacity. The co-production of research, whilst undertaken in indigenous communities was rarely implemented in other contexts. Therefore, the value of co-produced research in building local capacity, which is promoted on theoretical principles, has had limited application in the Australian context and provides an area for further research focus. 	Keep
Topic 4. Identification of the capacity of individuals, households, communities, businesses, industries and governments to adapt to climate change, and of options to enhance this capacity.	<ul style="list-style-type: none"> Understanding the capacity of civil society (i.e. beyond the primary production sector) Limited attention has been placed on specific capacity. Capacity is rarely linked to types of action taken. 	Refine
Topic 5. Understanding the equity dimensions of current and future vulnerability and adaptation	<ul style="list-style-type: none"> The equity dimensions of climate change adaptation remain an important area of research. Seek studies that directly engage vulnerable groups. While the rental sector has been a focus to date, studies examining the interacting stressors, responses and capacity for other ‘vulnerable groups’ remains outstanding. 	Keep and refine

Rationale

Stakeholder participation in research to explore vulnerabilities and capacity was an element of the peer-reviewed literature collated via the systematic review; however, the literature often reported on research that applied theory to collect data rather than collected data to inform theories of capacity. Furthermore, almost

half of the papers (44%) examined the capacity of rural landholders (e.g. horticulture and agriculture). Other target groups included coastal communities, coastal managers/authorities, humanitarian organisations, and tourism industry (approx. 1 paper per stakeholder group)(3.7%). Therefore, the findings of the review indicate that while the identification of capacity has progressed beyond generic determinants – and has involved a degree of engagement with stakeholders (predominantly via participation in surveys or focus groups) – attention has been placed on communities reliant on climate sensitive resources (e.g. primary production). An understanding of the adaptive capacity of groups beyond this sector is less well established. Further, there is a need for greater focus on the equity considerations of vulnerability, adaptation and capacity. Finally, while determinants of capacity are increasingly well understood (e.g. ability to plan, learn, engage), variability in the utility of determinants based on actions taken or objectives sought was not examined in the reviewed literature. In addition, there has been far these attention placed on specific determinants of capacity.

Results for low priority research topics

The research topics not assigned high priority included:

- Topic 2. Understanding the ways in which interacting biophysical, economic, social, cultural and institutional processes and systems, operating at various scales, expose individuals, households, communities, businesses, industries and governments to climate risks, and identifying options to alter this exposure in order to reduce vulnerability.
- Topic 3. Understanding the ways in which interacting biophysical, economic, social, cultural and institutional processes and systems, operating at various scales, make individuals, households, communities, businesses, industries and governments sensitive to climate risks, and identifying options to reduce their sensitivity to climate change.

The two topics received a total of 8 and 6 relevant hits respectively (1 each coming from the NCCARF research program). The results of the review highlight value in integrative research that seeks to explore trade-offs and how these can be incorporated in adaptation decision-making. However, the proportion of studies targeting integrative assessments of exposure and sensitivity was limited.

Theme 2 Understanding and overcoming the barriers and limits to adaptation

Introduction

This theme focused on the difference between the capacity to adapt to climate change and the translation of capacity into action by individuals and groups.

High priority topic recommendations

Topic	Knowledge gaps	Recommendation
Topic 6. Understanding the cognitive and affective dimensions of adaptation	<ul style="list-style-type: none"> • Priority of climate risks comparative to other concerns • Factors shaping perceptions of risk and responsibility (including the media) • Emotional responses to climate change 	Keep
Topic 7. Understanding enablers and barriers to collective action	<ul style="list-style-type: none"> • An understanding of the barriers and enablers to collaborative adaptation beyond high-level decision-making (e.g. local government or resource managers have been a focus rather than civil society). • Evaluation of the longer-term outcomes that can be derived from approaches/tools to aid collaborative decision-making (e.g. deliberation, forums, scenario method) and how to facilitate a transition from collective decision-making (or policy choice) to collective action. 	Refine
Topic 9. Measures to value adaptation. Understanding how to assess and value adaptations to climate change, including the value of opportunity	<ul style="list-style-type: none"> • The outputs of the review suggest this is an area requiring greater research attention, as the questions posed remain largely unanswered. Only one paper and three projects addressed methods to value adaptation. Further, when economic tools were applied to value adaptation, the tools were applied in specific contexts and the utility of the tools in different sectors was not examined. 	Consider end user requirements and refine

Topic	Knowledge gaps	Recommendation
costs, avoided damages, residual impacts, and benefits gained.	<ul style="list-style-type: none"> Do policy makers require economic valuation tools and methods, or are decision frameworks (as per N9-1 Jones) suitable? 	

Rationale

While understanding the cognitive and affective dimensions of adaptation was one of the most frequently addressed Topics in the papers sourced via the systematic literature review, there remain a number of knowledge gaps. These derive not only from a focus of the literature to date on rural communities, but also from a focus on measuring/collating perceptions rather than identifying the factors influencing perceptions. Further, while there has been significant attention paid to the barriers to adaptation, particularly for local government and other decision-making authorities, barriers to cross-scale collective action (e.g. individual, household, private sector, government) are less well established. Some researchers have explored the utility of tools to facilitate collaborative decision-making, yet reports on the barriers and the enablers to on-ground collective action are far less common. In fact, there is a tendency to focus primarily on barriers to action (whether collective or not) rather than the enablers of action. Therefore, research needs align to those specified, by topic, in the Summary Table below.

Results for low priority research topics

The research topics not assigned high priority included Topic 8 'Understanding limits to adaptation' and Topic 10 'Valuing adaptation'. Topic 8 received the least number of hits (only 1 hit from the systematic review specifically addressed 'limits to adaptation'). The results of Topic 10 are discussed in combination with the outcomes of Topic 9 – see full report for further details.

Theme 3 Understanding governance, institutions and decision-making

Introduction

This theme concerned research that conceptualizes and assesses vulnerability and adaptive capacity in ways that facilitate adaptation throughout society. It called for bottom-up and stakeholder-driven processes to understand vulnerability and adaptive capacity.

High priority topic recommendations

Topic	Knowledge gaps	Recommendation
Topic 11. Existing responses from public and private institutions to climate change risks, and assessment of proposals to improve the effectiveness, efficiency and equity of future responses	<ul style="list-style-type: none"> Limited knowledge regarding the utility of the actions taken by private and third sectors or how to improve the effectiveness of their actions. While the notion of shared responsibility in Australian hazard and adaptation policy has been discussed, limited research explores perceptions of responsibility across groups to whom it is assigned (e.g. although see Barnett et al. 2013, ID N11-1). Therefore, action research engaging groups in discussing responsibilities and establishing social contracts for adaptation and hazard response would be beneficial. Review of adaptation plans (and policy) has taken place, noting limitations and challenges posed by existing approaches; yet strategies to address limitations constitute high level statements regarding the need for greater coordination or more detailed planning. Therefore, applied research examining the 'process' of transitioning towards greater cross-scale collaboration, or adopting alternate modes of governance at different stages of transformation would be beneficial. 	Refine
Topic 12. Understanding how laws and legal institutions, including regulatory instruments, support or impede adaptation	<ul style="list-style-type: none"> NCCARF research and literature from the systematic review has contributed to addressing this research topic, exploring existing mechanisms and barriers to their adoption. Many recommendations for reform have been provided; however, there is limited evidence from which to assess the most effective approaches to reform or how challenges to reform may be overcome. Therefore, a knowledge gaps exists in our understanding of the processes of reform, including barriers 	Refine

Topic	Knowledge gaps	Recommendation
planning and practice, and identifying reforms needed to reduce obstacles	<p>and opportunities.</p> <ul style="list-style-type: none"> • Focus has been placed on instruments for managing risk or supporting adaptation on the coast or for wildfire. There is less understanding of the instruments in other sectors or for other risks. • An understanding of the incentives for change in the 'status-quo' for adaptation planning and policy across government. • Knowledge regarding how well adaptation laws can address societal concerns about the limits of adaptation (Verschuuren ID P12-16). 	
Topic 14. Assessing the potential for, and limits to, market-based adaptation measures, including insurance markets.	<ul style="list-style-type: none"> • The research identified in the review has provided a greater understanding of the opportunities afforded by and the barriers to water trading as a tool for managing drought risk by irrigators. However, similar research into carbon trading, or transferrable rights in fisheries, was not identified in the review. • Research examining the role of insurance featured in the review, and while there remain calls for better understanding insurance markets (e.g. residual market scheme) (McAneney et al 2013), all reviewed articles/reports reference greater gains in vulnerability reduction by reducing the economic costs and institutional barriers to adaptation faced by individuals and organisations. Identifying these costs and barriers may be more worthwhile area of research? 	Remove

Rationale

The focus of this theme was to push towards greater specificity in understanding of the roles of institutions and governance in adaptation. As part of this, analysis of existing responses from institutions sought to contribute understanding of how the equity and efficiency of such responses could be improved. While analysis of existing responses received the greatest number of hits (systematic review and NCCARF research combined) the breadth of institutions (private, public, third sector) and contexts (e.g. coast, water) captured under this Topic means drawing general statements regarding overall contributions to knowledge is difficult. Despite this, key areas receiving less attention were identified, including (i) roles and responsibilities for adaptation and (ii) the actions (including effectiveness and opportunities for improvement) in the private and third sectors. Research post 2011 has made a significant contribution to understanding how laws and legal instruments influence adaptation, particularly in the coastal zone and for water governance. This research leads calls for a National Adaptation Policy, whilst recognizing that barriers exist to its development. Addressing such barriers may entail an examination of frameworks and approaches to manage transformation under climate change, a research topic not assigned high priority in the 2011 NARP¹. Consequently, the following recommendations are made in addition to those for each Topic in the table above and include:

- Research investing strategies to change the status quo and contribute to national policy direction on adaptation. This topic may link to calls for research examining frameworks and approaches to manage transformations under climate change.
- Additional examination of market-based measures (e.g. tradable rights and carbon trading) would be beneficial, yet could be incorporated under a revised Topic 12 as policy instruments – with removal of Topic 14.

Results for low priority research topics

The research topics not assigned high priority included: (i) Topic 16 Tools to support decision-making; Topic 15 Frameworks and approaches to manage transformations; and Topic 13 Mainstreaming climate change adaptation. Topic 16 ranked fourth in terms of successful hits from the systematic review and NCCARF reports. The literature described tools for adaptation decision-making across a range of sectors. Literature assigned to Topic 15 focussed in the agricultural and water sectors. Only one peer-reviewed article was allocated to Topic 13. It reported on mainstreaming climate change adaptation into disaster risk management.

¹ The literature assigned to Topic 15 (managing transformations) focuses on the water and primary industry sectors.