



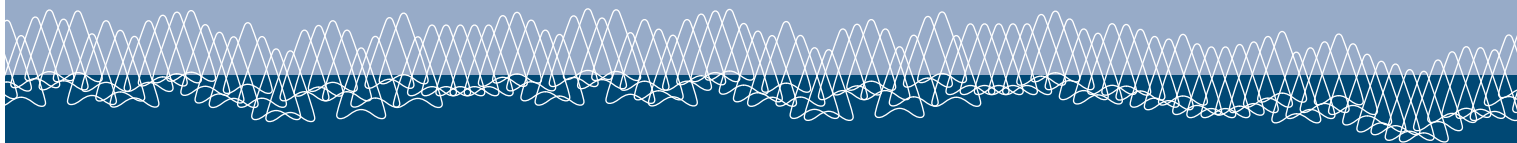
EAST COAST
NRM CLUSTER



IMPACTS & ADAPTATION
I N F O R M A T I O N
FOR AUSTRALIA'S NRM REGIONS



SCENARIO PLANNING



Background

This report has been produced as part of the Climate Change Adaptation for Natural Resource Management in East Coast Australia project. The project is being delivered by six consortium partners: University of Queensland (Consortium leader); Griffith University; University of the Sunshine Coast; CSIRO; New South Wales Office of Environment and Heritage; and Queensland Department of Science, IT, Innovation and the Arts (Queensland Herbarium) to foster and support an effective “community of practice” for climate adaptation within the East Coast Cluster regions that will increase the capacity for adaptation to climate and ocean change through enhancements in knowledge and skills, and through the establishment of long term collaborations.

Funding for the project is received from the Australian Government as part of the Natural Resource Management Climate Change Impacts and Adaptation Research Grants Program, under Stream 2 of the Natural Resource Management Planning for Climate Change Fund.

Acknowledgements

The authors acknowledge the important contribution and cooperation of stakeholders from East Coast Natural Resource Management Regional Body and research consortium partners who participated in the workshops and contributed to the development of this report.

Citation

Cox, M., Serrao Neumann, S., Schuch, G. and Low Choy, D. (2015). *Scenario Planning for NRM Planning for Climate Adaptation*. May 2015. Climate Change Adaptation for Natural Resource Management in East Coast Australia Project, Griffith University.

Copyright

© 2015 Griffith University

Disclaimer

The views expressed herein are not necessarily the views of the Commonwealth of Australia, and the Commonwealth does not accept responsibility for any information or advice contained herein.



An Australian Government Initiative



Queensland Government



FITZROY BASIN ASSOCIATION



Local Land
Services
North Coast



Local Land
Services
Greater Sydney



Local Land
Services
Hunter



Office of
Environment
& Heritage



THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA



Global Change Institute



Burnett Mary
REGIONAL GROUP
Practical Solutions for Natural Resource Management



University of the
Sunshine Coast
Queensland, Australia



THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA


UNIVERSITY OF
WOLLONGONG
AUSTRALIA





CONTENTS

Scenario planning – Introduction	4
Scenario planning – Process	6
Scenario planning in the East Coast Cluster	8
An example process – Steps 1 and 2	10
An example process – Steps 3, 4 and 5	12
An example process – Steps 6 and 7	14
Scenario planning – Resources	16
References	17



INTRODUCTION

Scenario planning involves testing strategies under different possible future scenarios.

It is useful in situations where there is high uncertainty.

WHAT IS SCENARIO PLANNING?

Scenario planning is a strategic tool that can be used to assess policy options under possible, plausible futures. It provides a systematic approach for developing and testing plans and policies under uncertainties. It is particularly useful where there is high uncertainty and low controllability. Scenario planning is not about identifying the most likely future and planning for it, but about identifying a range of possible, plausible futures and testing how well existing (or new) strategies would work in those futures.



Scenario planning has been used extensively by many major organisations and governments, notably the Royal Dutch Shell Company when in the 1980s it considered the impacts of a fall in oil prices, at a time when no-one believed a fall was possible. Months later, the oil price crashed, and Shell was in a better position to deal with the fallout as a result of the prior use of scenario planning.

HOW CAN SCENARIO PLANNING BE USED IN NRM PLANNING?

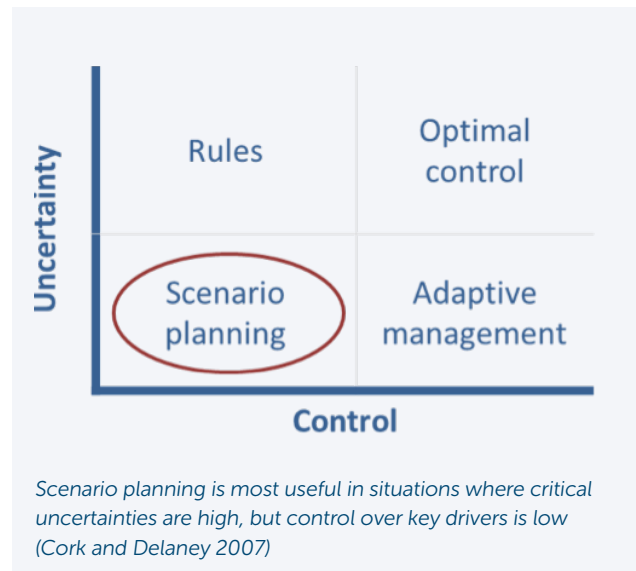
Scenario planning is most useful at a strategic level, but can also be used to test implementation strategies. The main uses of scenario planning are to develop new, or test existing, strategies, plans or policies (future options for management and development) against a range of possible futures. It is particularly useful for encouraging a team or broad group of people to think over longer time scales, and gives people licence to think about futures that would normally be considered implausible; (e.g. 'that's never going to happen so we don't need to think about it'). It helps to shift focus from 'what will happen' to 'what will we do if it happens'. It can be used to test broad strategies (e.g. from a catchment management plan), or more specific implementation plans.

AUDIENCE

Wider settings (such as regional scales) are well-suited to integration of issues across different sectors, while organisational and community scales enable scoping of specific and tailored adaptation options (Serrao-Neumann and Low Choy 2014). Careful selection and involvement of stakeholders representing a variety of interests and perspectives can help to reconcile individual and collective interests and avoid over-representation of individual stakeholder groups (Serrao-Neumann et al. 2014a). Scenario planning can be used in collaborative problem solving approaches to assist shared learning across multiple participating sectors and research disciplines (Serrao-Neumann et al. 2014b).

WHAT DOES SCENARIO PLANNING INVOLVE?

There are different forms of scenario planning. The most common used in strategic analysis is based on identifying the key drivers in the system, and exploring future scenarios aligned with these. The steps are discussed in detail in the description of the scenario planning process, and include:



"What is interesting is how the same strategy [that seems reasonable now] can appear quite different when you consider it under the different futures."

(paraphrased quote from workshop participant)

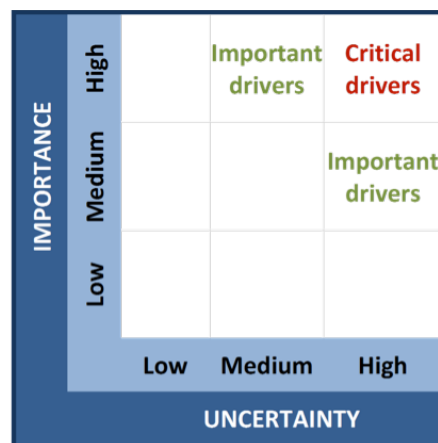
SCENARIO PLANNING – PROCESS

IDENTIFY THE FOCAL QUESTION

1. The focal question should be relevant to critical issues facing the organisation, and broad enough for wide-ranging exploration of the issues.

ASSESS KEY DRIVERS

2. The first step in assessing key drivers is to brainstorm current and future drivers of change. Groups should consider these across a range of issues, e.g. social, environmental, economic, technological, and political. The second step is to classify these drivers according to their degree of uncertainty and importance (usually done in a matrix format with low, medium and high levels on each axis). Small group exercises work well for these steps. The critical drivers are those that have both high uncertainty and high importance; drivers that are high on one axis and medium on another may also be considered as important. Each of these drivers is then 'unpacked' by looking at likely trends and shocks and surprises. The final step in identifying drivers is to rank them in order of importance, usually by voting.

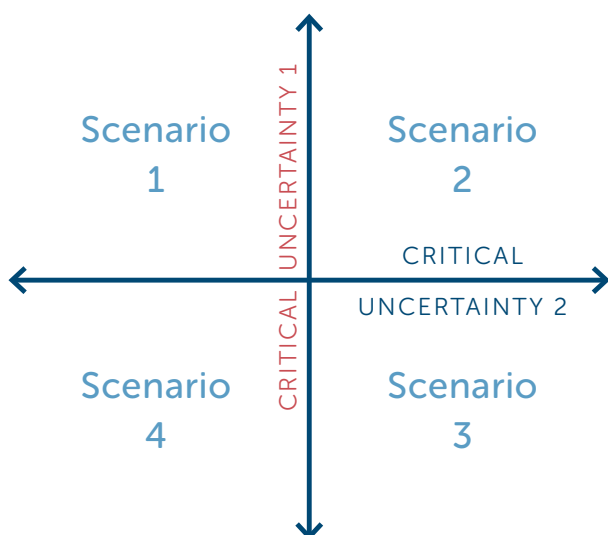


DEVELOP MULTIPLE FUTURE SCENARIOS

3. The two most important drivers are chosen as the basis for the scenarios. They are displayed on an axis, with low and high values for each, to create 4 possible future scenarios. Each scenario is named and described to generate four possible scenarios. The workshop group begins the process by considering the potential impacts, likely trends and surprises for each scenario.

DEVELOP SCENARIO NARRATIVES

4. Usually two scenarios are selected for development that will then be used to test the robustness and veracity of future oriented options such as policies, strategies and programs that are directed towards a future outcome. The scenario narratives are then developed, utilising the workshop outputs and supported by literature review and stakeholder interviews where possible. Narratives or storylines are often used as quick and memorable ways to describe the scenarios. Importantly, the scenarios need to be reviewed to ensure they are plausible and internally consistent.



IDENTIFY FUTURE OPTIONS FOR TESTING

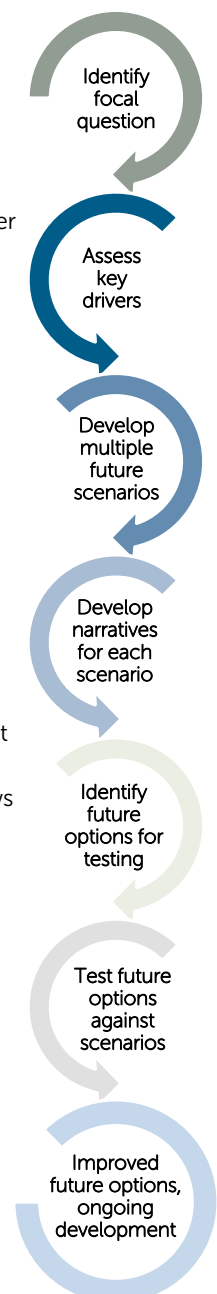
5. The purpose of scenario planning is to improve policies and strategies. The next step in the process is therefore to select existing future directed options, or develop new future options, that can be assessed. Selection of the future options to be examined, or development of new strategies, needs to be done by the group through a consensus process.

TEST FUTURE OPTIONS AGAINST THE SCENARIOS

6. This is often described as a 'wind tunnel' test, where the scenarios are analogous to wind tunnels used to test 'aircraft' (the future options). This process will identify challenges and opportunities, as well as provide information on specific options that work well or need modification under each of the scenarios. This involves testing strategies against a set of criteria for each of the scenarios, and identifying any proposed changes to the strategies that would be required. A critical component of the process is to identify 'sign posts', or indicators that can be used to identify trends in line with a particular scenario. One way to do this is to describe a 'roadmap' or pathway from the present to the future scenario, along with key events or observations that could be monitored.

DEVELOP IMPROVED STRATEGIES

7. The future options can then be classified or ranked. Some may be robust and work well under any scenario; others may only work under one scenario and be maladapted to others. The most likely case is that options may need some adjustment or improvement. The final step is to continue to use the scenarios in the long-term. This might include monitoring or scanning for the indicators or 'sign posts', developing and implementing new future oriented options (e.g. plans, policies or strategies), or implementing any changes or modifications. It could also include further developing or using the scenarios with a broader range of stakeholders. One key output of the scenario process is that it gives the organisation a language to talk about future events that allows for broad discussion and multiple points of view, without focusing on the most likely future.





SCENARIO PLANNING IN THE EAST COAST CLUSTER

WHAT HAPPENED?

A **Scenario planning** exercise for the **East Coast Cluster** (6 NRM regions from Rockhampton to Sydney) as part of the Climate Change Adaptation for NRM Project, held over two workshops in November 2014 and April 2015 in Brisbane.

WHY?

To improve climate change adaptation planning in NRM by testing future options (plans, policies, strategies) against a range of possible futures.

To develop the capacity of NRM planners to use scenario planning as a strategic planning tool.

HOW

There is more than one way to do scenario planning.

This method uses key drivers to create 2 different future scenarios, which are used to test a range of future options.



WHAT HAPPENED?

Participants identified two key drivers that will influence the East Coast Cluster in the next 25 years and need to be taken into account in NRM planning for climate change adaptation:

- *Community driven climate change action*
- *A maturing response to NRM*

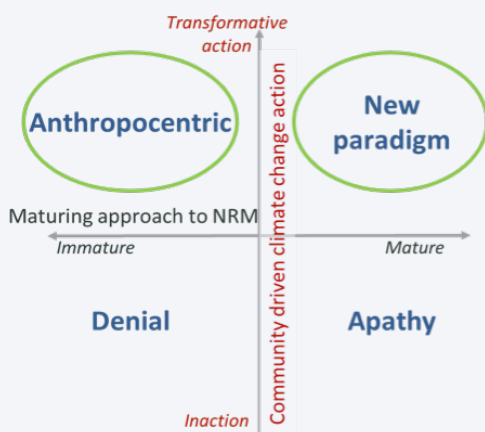
The two key drivers were placed along the two axes and scenarios identified for each of the four quadrants. Two future scenarios were chosen for further analysis:

- *Anthropocentric*
- *New paradigm*

Scenario outlines were developed by workshop participants, and researchers mapped out more detailed scenario narratives for the second workshop.

Each NRM region identified 6 strategies to be tested against the two scenarios.

Participants at the second workshop assessed strategies against the 'what if' questions for each scenario. As a group, they then identified signposts, shocks and surprises that might occur on the 'roadmap' from the present into the future.



Scenarios developed by the East Coast Cluster

WHO WAS INVOLVED?

The workshops included:

- 6 East Coast NRM bodies
- East Coast Cluster researchers
- local government stakeholders
- industry stakeholders.

Workshops were run by Griffith University researchers.

SO WHAT?

Strategies that seem reasonable under current conditions may have negative impacts under different futures, or may need to be implemented in different ways.

Considering strategies under different scenarios provides useful insight into the impacts of key drivers and how planners might choose different approaches in response to unexpected events.

Planning while the climate is changing requires a forward-looking approach, where past experience may not be a reliable guide to effective action for the future.

There is more than one pathway to achieve a vision or goals from a given starting point. Different pathways may be more or less appropriate as circumstances change.

Shocks and surprises cannot be predicted, but considering multiple futures can help to create flexible, robust strategies that are better able to meet surprises.



AN EXAMPLE PROCESS – STEPS 1 AND 2

SETUP – BEFORE YOU START

Deciding on scenario planning

The first step in scenario planning is to identify how the process will be used in the organisation, and who the key decision makers are. This may include key external stakeholders, particularly in NRM where much is done in partnership with other organisations (e.g. local government). It is important that key decision makers commit appropriate time and resources to the project for it to be successful.

Workshops

This scenario planning process includes 2 workshops, ideally held about 1-2 months apart and involving the same participants. Some separation between the workshops is necessary to allow time for the scenario narratives to be developed, but the greater the time between the workshops, the greater the chance that the original participants will not be available.

Each workshop lasts one day. It is possible to conduct scenario planning over a longer time, to allow the scenarios and strategies to be explored in greater detail. However, it would be difficult to compress the exercise into a shorter time, due to the amount of group work and discussion required in several of the steps.

Prior to the workshop it can also be useful to develop a series of fact sheets to ensure that all workshop participants have at least a basic understanding of the same background information. This could include general information about the system, the location and the environment that is the focus for the scenario planning. This is particularly useful in cases where workshop participants are drawn from a range of stakeholder and interest groups. In this case, as participants from NSW and QLD were included, the focus of the factsheets was aspects of planning relevance to the two states. Fact sheets included: the scenario planning process, climate change projections, natural resource management, planning, disaster management in NSW and QLD, and general population and demographic information on the cluster as a whole.

The focal question

The focal question should be relevant to current critical issues facing the organisation, and broad enough to allow for wide ranging exploration of the issues.

The focal question for this exercise was:

What current and future drivers of change will influence the East Coast Cluster in the next 25 years and which need to be taken into account in NRM planning for climate change adaptation?

THE FIRST WORKSHOP

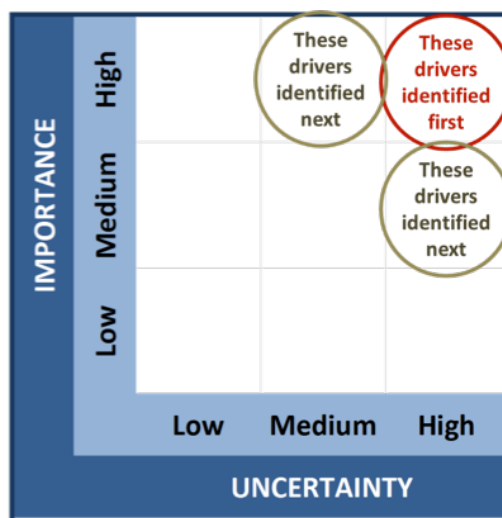
Key drivers

To ensure that the process is useful, the key drivers must be identified by the workshop participants. The first step was to brainstorm possible drivers in response to the focal question, in small groups. At this stage, all ideas are included and none are too implausible to be considered. The second part involved classifying these drivers in terms of their uncertainty and importance. One way to do this is to record all drivers on sticky notes at first, then place these in the appropriate positions on a large matrix of drivers.

The next stage was to prioritise the drivers for further investigation. Scenario planning is most appropriate for drivers that are highly important and highly uncertain. The highly uncertain and important drivers were therefore identified in plenary from all the groups. For each of these key drivers, the likely trends, shocks and surprises were identified.

Lastly, the two most important drivers were identified by voting (each person had 3 votes). *Community focus on climate change* was ranked the highest, followed by *climate disasters* and *maturing approach to NRM*.

Following discussion in a plenary session, a second vote was held and *maturing approach to NRM* and *community focus on climate change* were voted as being the two critical drivers to be considered further in the scenario analysis. It was noted that climate disasters would be a feature in any scenario.



DRIVER	VOTES	DRIVER	VOTES
Community focus on climate change + bipartisan support → driving action	13	Mistrust in institutions	2
Maturing approach to NRM (community support and increase in strategic NRM)	10	Artificial intelligence taking over information systems	1
Climate disasters	10	Meteor strike or global cataclysm	1
Green economy	7	Reduction in demand for Australian coal	1
Lack of governance to deliver NRM	6	Improved ecological restoration technology	0
Internationally agreed mitigation targets	6	New technology for carbon capture	0
Economic instability	4	Change in ocean currents (due to sea temp.)	0
New biosecurity threat to keystone species	3	Discovery of viable alternative energy	0
Increasing use of robot ranges	3	Changing media technologies	0
Energy security and balance	2	Conflict (regional – SE Asia, Australia)	0

Critical drivers of change identified by the East Coast Cluster in response to the focal question

AN EXAMPLE PROCESS – STEPS 3, 4 AND 5

SCENARIOS

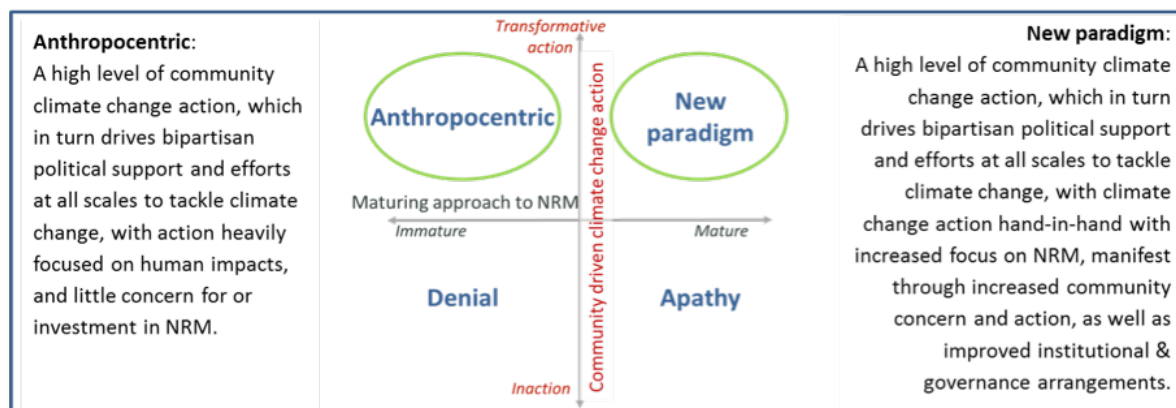
The two critical drivers were placed along the two axes and scenarios identified for each of the four quadrants (see figure below). Due to time and resource constraints, not all 4 of the scenarios could be developed into full narratives. Two scenarios were chosen by voting in plenary session (2 votes each): Anthropocentric, and New Paradigm.

Both are characterised by a high level of community climate change action, which in turn drives bipartisan political support and efforts at all scales to tackle climate change. In the 'Anthropocentric' scenario, the climate change action is heavily focused on human impacts, and there is little concern for or investment in NRM. In the 'New Paradigm' scenario, climate change action goes hand-in-hand with increased focus on NRM, manifest through increased community concern and action, as well as improved institutional and governance arrangements. Working in small groups, participants constructed elements of preliminary scenario narratives by identifying characteristics of each scenario at global, national, and cluster scales. Following the workshop, the research team developed the brief descriptions of the scenarios into longer scenario narratives, using the key characteristics identified in the first workshop, and in literature.

Strategies

The main point of the scenario planning exercise is to assess the effectiveness of current and future strategies under different situations. At the time of the exercise, the 6 regional NRM bodies were at different stages in their strategic planning. The 3 NSW regions had existing Catchment Action Plans created by the then Catchment Management Authorities (CMAs), but these were considered of limited relevance to the newly-formed Local Land Services (LLS) organisations. The LLS were in the process of drafting their local strategic plans. In QLD, SEQ Catchments and Fitzroy Basin Association had strategic NRM plans that were largely complete, while the Burnett Mary Regional Group had a draft regional NRM plan. Each region was asked to identify 6 strategies and associated targets or actions for testing in the second workshop.

BETWEEN WORKSHOPS



Scenarios developed for the East Coast Cluster



ANTHROPOCENTRIC

+ POSITIVE TRENDS

- Risk assessment approaches are common, leading to improved understanding of likely impacts
- Some decreases in emissions; remaining emissions largely mitigated
- Most of the population protected from climate change impacts by engineering solutions
- Many people feel secure as their lifestyle can remain relatively unchanged
- Employment is high and economic conditions are generally good
- Some marginal agricultural lands that have been abandoned may regenerate

- NEGATIVE TRENDS

- Limited flexibility in application of NRM funding leads to narrowing focus
- Sensitive ecosystems lost due to extreme events
- Low rates of volunteerism and funding along with low rates of support for NRM
- Water conflict intensified due to ongoing droughts and floods
- Lack of community involvement in decisions leading to centralised decision making
- Reduced focus on environment leading to a double bottom line approach – economy and people only are considered

NEW PARADIGM

+ POSITIVE TRENDS

- Improved governance models resulting in improved communication and reduced silo mentality
- Increased community input and involvement should lead to improved capacity and social resilience
- Regional focus can improve local knowledge and management and lead to policy solutions well adapted for each location
- The focus on broader indicators of progress contributes to better understanding of links between environment, social and economic

- NEGATIVE TRENDS

- Some business sectors have collapsed or declined significantly, e.g. insurance, retail
- Strong reliance on community volunteers may result in reduced government provision of services over time
- Need for extensive consultation may result in delayed responses or policy change
- Reduced travel between regions could result in insularity and parochial thinking
- Multiple regional approaches to innovation may lead to lack of consistency that inhibits take-up of best solutions
- Some people may feel disenfranchised as the shift in values means their skills are not desired



AN EXAMPLE PROCESS – STEPS 6 AND 7

WORKSHOP 2

Testing strategies

Ideally, NRM practitioners and their key stakeholders would work together to assess strategies for their region. However, as it was not logistically possible to assemble such a large group in one central location for the workshop, there were not enough attendees at the workshop from each region to allow this. Instead, participants from the regions were mixed throughout the small groups and worked on assessing strategies from all regions.

Each strategy was tested or assessed against a series of 'what if' questions. The questions can be adapted to the specific scenario exercise, but should cover a range of criteria. 'What if' questions in this exercise were:

- To what extent will this option enable the East Coast to deal with future major natural hazards?
- To what extent will this option enable the East Coast to deal with future shocks and surprises (e.g. economic downturn, collapse of the international and national tourism industry, dramatic changes to oil availability)?
- To what extent does this option represent the best use of public money?
- To what extent will this option have a negative impact on the East Coast?
- To what extent will this option assist the East Coast to fulfil its vision?

There are several considerations when answering the questions, including:

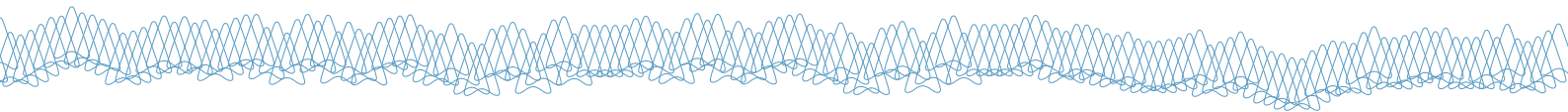
- How difficult would it be to implement the strategy / action under the scenario?
- If the strategy / action could be implemented, would the result be desirable?
- What aspects of the scenario would impact on implementing the strategy?

Due to time limitations, only a few strategies were tested against both scenarios. As expected, the scenarios were assessed differently under the two scenarios, particularly in relation to how they would be implemented or the level of support that the strategies would have from the broader community. No strategies were identified as having negative impacts, but participants highlighted some ways that strategies could be improved or would need to be modified under the different scenarios.

Roadmaps and signposts

One of the important outcomes from scenario planning is the recognition of potential signposts or indicators that show which future we are heading towards. Of course, a particular scenario will never eventuate exactly as described in a narrative, but it is useful to recognise critical aspects of a scenario and understand the potential implications for planning and implementation.

One way to build this understanding is to consider the pathway from now to possible futures, including positive and negative signposts, possible shocks and surprises. The use of terminology such as 'pathway', 'roadmap' and 'signposts' reinforces the main premise of scenario planning – that there are multiple possible futures, and it is important to be able to recognise and respond as events change the course we are on. This also links with the 'adaptation pathways' approach to climate change adaptation, which emphasises a sequence of adaptation options, and includes analysis of the robustness and flexibility of adaptation options under different futures (Bosomworth et al. 2015). Workshop participants developed a roadmap identifying events at global, national and cluster scale.



Once identified, signposts can be incorporated into NRM planning through monitoring key indicators of change. It should be noted that many of these are likely to be external and not under the control of NRM bodies. NRM monitoring and evaluation programs usually focus on indicators that are directly related to their activities; consideration of future scenarios highlights that it might also be useful to consider scanning techniques to identify possible significant changes in drivers in advance.

CONCLUSIONS

Scenario planning is one part of an adaptive strategic planning process that is forward-looking and explicitly considers the robustness and flexibility of strategies under different possible futures, and different pathways to achieving a goal or vision. Messages from the scenario planning exercise were:

- Strategies that seem reasonable under current conditions may have perverse or negative impacts under different futures, or may need to be implemented in different ways
- Considering strategies under different scenarios provides useful insight into the impacts of key drivers and how planners might choose different approaches in response to unexpected events
- Planning while the climate is changing requires a forward-looking approach, where past experience may not be a reliable guide to effective action for the future
- There is more than one pathway to achieve a vision or goals from a given starting point. Different pathways may be more or less appropriate as circumstances change
- Shocks and surprises cannot – by definition – be predicted, but considering multiple futures can help to create flexible, robust strategies that are better able to meet surprises.



SCENARIO PLANNING RESOURCES

EXAMPLES AND CASE STUDIES

There are two famous examples of scenario planning:

Shell used scenario planning in the mid-1980s to consider the impacts of a fall in oil prices, months before it eventuated.

<https://hbr.org/1988/03/planning-as-learning/ar/1>

Shell continues to generate global scenarios and make these available. The most recent scenarios are the 'New Lens' scenarios that deal with the distribution of power and resource availability, in relation to prosperity, leadership and connectivity.

<http://www.shell.com/global/future-energy/scenarios.html>

In the early 1990s, the Mont Fleur scenarios were generated in a series of multi-stakeholder forums to imagine possible futures for South Africa after apartheid.

<http://futuristablog.com/the-mont-fleur-scenarios/>
www.generonconsulting.com/publications/papers/pdfs/Mont%20Fleur.pdf

The Millennium Ecosystem Assessment project developed four scenarios to examine possible benefits and risks for ecosystems and human well-being, through a wide ranging process including literature reviews, interviews, expert workshops and quantitative modelling.

<http://www.millenniumassessment.org/en/Scenarios.html>

An introduction to scenario planning and application to the Namoi catchment.

www.archive.ils.nsw.gov.au/__data/assets/pdf_file/0006/496491/archive_scenario-planning-for-sustainable-landuse-in-the-namoi-catchment.pdf

The South East Queensland Climate Adaptation Research Initiative (SEQCARI) used scenario planning with local governments to test climate change adaptation options for a range of settlement types.

www.griffith.edu.au/__data/assets/pdf_file/0004/464251/Griffith-University-SEQCARI-Scenario-Report-Oct-2012.pdf

TOOLS AND RESOURCES

National Park Service (2013) *Using Scenarios to Explore Climate Change: A Handbook for Practitioners*.

<http://climate.calcommons.org/bib/using-scenarios-explore-climate-change-handbook-practitioners>

Introduction to scenario planning: slideshare

<http://www.slideshare.net/mkconway/introduction-to-scenario-planning>



REFERENCES

Bosomworth, K., A. Harwood, P. Leith and P. Wallis (2015). Adaptation Pathways: a playbook for developing robust options for climate change adaptation in Natural Resource Management, Southern Slopes Climate Change Adaptation Research Partnership (SCARP): RMIT University, University of Tasmania, and Monash University.

Cork, S. and K. Delaney (2007). Scenario Planning for Sustainable Landuse in the Namoi Catchment: An Introduction to Scenario Planning, Delaney and Associates and EcoInsights. <http://www.vcccar.org.au/building-common-understanding-scenario-based-strategies-to-inform-climate-change-adaptation>

Serrao-Neumann, S., Crick, F., Harman, B., Sano, M., Sahin, O., van Staden, R., Schuch, G., Baum, S. and D. Low Choy (2014). Improving cross-sectoral climate change adaptation for coastal settlements: insights from South East Queensland, Australia, Regional Environmental Change, 14, pp489-500.

Serrao-Neumann, S., Schuch, G., Harman, B., Crick, F., Sano, M., Sahin, O., van Staden, R., Baum, S. and D. Low Choy (2014). One human settlement: A transdisciplinary approach to climate change adaptation research, Futures, 65, pp97-109.

Serrao-Neumann, S. and D. Low Choy (2014). Multi-stakeholder scenarios for decision-making in the face of climate change: the matter of scale, Urban Futures Squaring Circles Conference, Lisbon, Portugal.



EAST COAST
NRM CLUSTER



IMPACTS & ADAPTATION
I N F O R M A T I O N
FOR AUSTRALIA'S NRM REGIONS

Cox, M., Serrao Neumann, S., Schuch, G. and Low Choy, D. 2015. *Scenario Planning for NRM Planning for Climate Adaptation*. May 2015. Climate Change Adaptation for Natural Resource Management in East Coast Australia Project, Griffith University. <https://www.terranova.org.au/repository/east-coast-nrm-collection/planning-packages>