Transformational Change for Resilient Landscapes and Communities

Scoping Study

Research Team

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Summary of Findings

Overall the scoping phase of the *Transformational Change for Resilient Landscapes and Communities* project has been very successful.

The partners have formally committed to and become tightly engaged in the project and are keen to start on their respective collaborative case studies. They have expressed great support for the participative action research approach – clearly not having a say in the development of R&D projects and being used as research guinea pigs is wearing thin. The Canberra workshop and follow up material and visits have convinced not only the initial champions but also other decision makers in the partner organisations that this process is genuine and they will have a real say in the project direction and progress.

The partners have also entered into collaborations and new governance arrangements with their neighbouring NRM or Local government organisations with enthusiasm and real purpose. There have been many comments from champions and new participants (including Mayors and Board Members) that attended the follow up site visits that this type of cross-scale collaboration is long overdue.

Partners have also developed and expressed confidence in the potential of resilience thinking, adaptive governance and collective social learning and the tools we have chosen to make a real and practical contribution to tackling wicked NRM problems and in making a transition to sustainable resource use.

It is most important that this momentum is not lost and that we are able to focus the enthusiasm.

The case studies proposed by the partners are real time, real life cases of urgent NRM problems that cannot be successfully addressed under the current NRM paradigm. Not withstanding that, these case studies cover many of the NRM landscape management and community engagement issues faced by many other NRM organisations including local governments. As such there is now confidence that the experiences of the partners over the next three years will become valuable aids to transfer of this approach to other NRM regions throughout Australia.

From a research perspective there is now a strength of purpose among the research team and a sense of excitement that the concepts and the overall design and approach have found strong resonance with the partners. We think the partner engagement and involvement in the scoping phase has been particularly useful in tightening the research focus and delivering a workable and achievable project of national significance. We have been able to respond quickly to requests for workshops rather than written information and the project is richer for that input. The case studies also promise a rich source of academic knowledge and learning.

Any concerns that the project is just an esoteric exercise can now be confidently put aside. It is clear from the case study projects chosen by the partner collaborations that the outcomes will be both deeply practical and highly innovative. The new design is achievable within budget given additional partner cash and in-kind contributions and the partners and research team are keen to embark on this project.

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1 Introduction

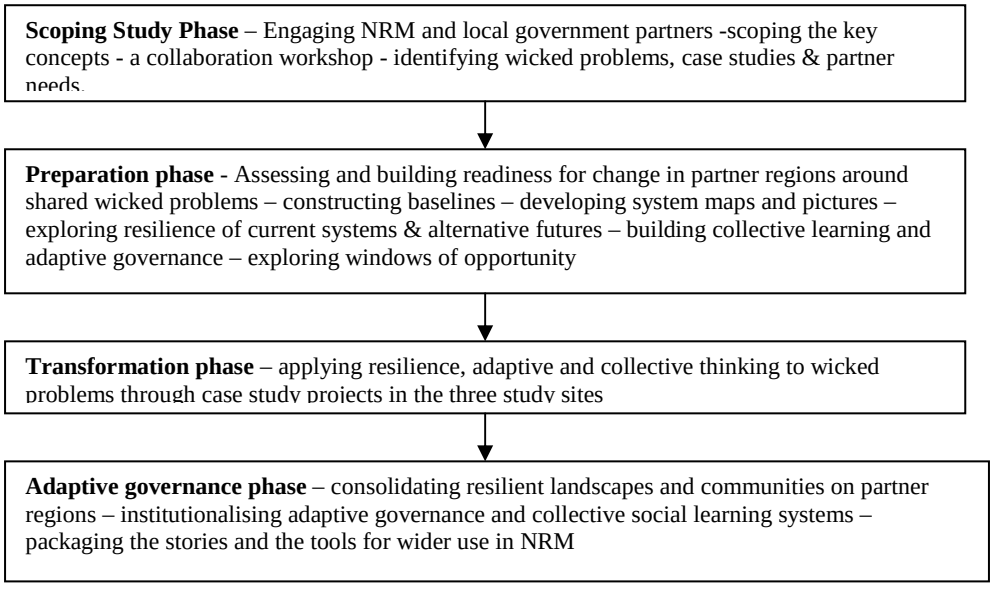
1.1 Background

In June 2008 Land & Water Australia (LWA) in partnership with a research team from the Institute for Land Water & Society (CSU), The Fenner School at ANU and CSIRO Sustainable Ecosystems submitted a project proposal to the national Caring for Our Country (CfOC) program. The proposed project *Transformational Change for Resilient Landscapes and Communities* was set in three study sites: Nth Queensland, the ACT and Southern Victoria. It sought to bring three deeply insightful ideas: resilience, adaptive governance and collective social learning to bear on agreed 'wicked NRM problems' and to test whether the new thinking behind these concepts and a collaboration between NRM regions and local government could assist in making a transition to sustainable resource use.

The project was designed as a synthesis project – extending ideas and building on the findings of several pieces of NRM related research activities funded through the Social and Institutional Research Program (SIRP) at LWA. These projects include work on business process improvement (CSU), pathways to good governance for regional NRM (UTAS & CSU), the relationship between NRM regions and local government on environmental management (ANU), peri-urban landuse issues (UNE) and practice change for regional NRM (Hassall). While the application to CfOC was unsuccessful the Board and management of Land & Water Australia remained supportive of the project. SIRP program staff worked with the research team to refine and tailor the project.

In December 2008 Rod Griffith & Associates (a member of the research team) was contracted to prepare a scoping study as phase 1 of the wider project (figure 1). This report sets out the findings from that study and the implications for implementation of the full project in the three case study regions.

Figure 1: The scoping study in the context of the wider Transformation Project



1.2 Scoping Study Aims

The scoping study was commissioned by LWA to:

- Establish the necessary partner relationships and commitment to undertake participatory action research and social learning initiatives in the proposed project.
- Develop effective communication processes to ensure that emerging ideas like resilience thinking, adaptive governance and collective thinking are seamlessly introduced into social learning spirals operating in the three study regions.
- Review the contributing literatures and scope the applicability of key concepts and tools to the project

The scoping process was a very valuable contribution to the project and saved considerable time and effort that would otherwise have been necessary in establishing this complex project. Partners have commented that they have appreciated being given a say in the project development and that scoping phases of many NRM projects are either absent or too short to sort out all the necessary communication and content issues. They claim that too often researchers take what they want from regional partners without leaving any lasting legacy of improved business in the region.

1.3 Key scoping study outcomes

Some key outcomes of the scoping study are:

1. As a result of the initial workshop and follow up visits, three strong collaborations between NRM regional bodies and local governments have formed around addressing agreed wicked NRM problems in Nth Queensland, the ACT and Southern Victoria.
2. Six partner organisations have committed cash and in-kind support to the project for three years and identified a number of champions to work closely with the research team– it is expected another two partners will join the project.
3. Initial discussions have commenced to include a fourth study site in NSW relating to irrigated agriculture
4. The project design and workflows have been refined as a result of input from the partners.
5. The partners have expressed support for the practical relevance of the project. and the tools that will be developed and used for their ongoing management of NRM and as a means of readying themselves and their shared communities for significant change
6. Partners have identified a number of ‘wicked NRM problems’- those complex problems created by our society that do not have a one off solution - which have wider applicability in NRM in Australia. There is now a shared understanding of these problems between researchers and partners of language and partner needs from the project around these challenges.

7. A case study has been agreed in each study region and tested against a set of evaluation criteria for the project – all cases are multi-dimensional and bridge across scales
8. The specific NRM issues to be covered by case studies include: the Wet Tropics World Heritage Area, Indigenous partnerships, wetland chain management, agricultural practice change, landscape to Great Barrier Reef soil and water processes, coastal zone management, engagement of peri-urban communities, native vegetation and bushfire management, conservation & future settlement patterns, ecological footprints, and the community landscape.

These processes used by the research team to arrive at these outcomes are described in more detail in **Section 3.**

2 Project Concepts and Tools

The proposed Transformation Project is based around bringing several key concepts to bear on shared NRM problems currently being addressed separately by regional NRM bodies and local government. These concepts are:

- Resilience
- Adaptive governance
- Collective social learning

These three important concepts need to be positioned in the context of:

- Transition –particularly a transition to sustainability or sustainable resource use
- Transformation – and its relationship with adaptation
- Linked social-ecological systems - in which landscape and communities are embedded

These are powerful but complex concepts. Our task as researchers is to make them accessible to practitioners in the field. The following sections cover a process for ensuring a shared understanding of these terms with partners, some sense of the paradigms underpinning these concepts and the source of some of the key tools that will be used and tested in the project. If useful they will form the basis of packages of material to inform wider communication and take-up of this type of thinking in NRM.

2.1 Establishing a shared understanding of terms

Resilience, transition and transformation are terms in everyday use. Each has a broad general meaning and a number of more specific applications with sometimes conflicting definitions.

Adaptive governance and collective social learning are in more restricted use and are still under construction in the literature. The proposed transformation project will contribute to their refinement.

Social-ecological systems is the terminology applied by the Resilience Alliance (an international grouping of ecologists and social scientists based in Stockholm) to the units of landscape which ideas like resilience and adaptive governance are applied. There are other terms used in other paradigms to describe this linkage between social and ecological spheres.

The Canberra workshop and follow up site visits have been very useful in taking the first steps towards a shared understanding of these terms, rather than the scoping papers as expected. In the workshop discussion these terms immediately exposed participants to a range of related terms highlighting the need for a glossary of terms to be used in the project.

For example in the workshop a consensus emerged over the use of adaptation which is used in the Resilience Alliance vocabulary rather than use transaction or incremental. So now there is a shared understanding among partners and the research team that partners can make choices between two types of change: adaptation which is change within an existing system and transformation which shifts to a whole new system.

Rather than the usual practice of the researchers preparing a glossary, one of the first research actions for the project will be to establish that glossary with the partners.

2.2 Resilience, adaptive governance and collective social learning paradigms

Resilience thinking, adaptive thinking and collective thinking can be thought of as discourses or paradigms. That is they each have a distinctive basis for knowledge construction and language, a repetitiveness in the use of metaphors, the way relationships between entities are recognised and conveyed, a particular value system (though usually implicit and buried) and a reasonably tight and habitual methodology. The brief discussion that follows of each of these paradigms is supplemented by more detailed treatment in the three scoping papers at **Attachment B.**

2.2.1 Resilience thinking

Our entry point to resilience thinking is a recent book *Resilience Thinking* by Walker & Salt which draws on the language and metaphors of the Resilience Alliance. Under this paradigm resilience is a portrayed as systems based idea. A system can exist in a number of more or less stable states or regimes. Resilience thinking is concerned with system behaviour and threshold at the unstable edges of these systems and with the dynamics that either keeps the system in its present regime or allows a regime shift. It is essentially a measure of how much change a social-ecological system (landscapes and communities) can absorb and still retain essentially the same structure function and feedbacks.

Resilience is a desirable characteristic of a social-ecological system when landscapes are delivering the ecosystem services and well being desired by its communities. So clearly the message to be conveyed to practitioners is how to understand and picture these systems and then assess their resilience. If the system is failing to deliver these outcomes then resilience in the system presents a challenge for governance and management of the system.

While the resilience paradigm started in ecology and related to adaptation and adaptive behaviour in natural ecosystems it has over time diversified to incorporate notions of governance and strong linkages to social behaviour. This includes forays into deliberative social processes.

This is where the idea of transformation becomes more prominent. Transformation occurs when the amount of change at the edges is too large to maintain resilience and the system undergoes profound change to a whole new system. This process can be forced on communities – for example development, landuse planning and increasingly climate change – or it can be managed. The aim, of this project is to explore the dynamics when that type of change is embarked up intentionally.

2.2.2 Adaptive thinking

Adaptive thinking has been around for some time. It emerged with the new understanding that social, ecological and economic systems can be conceptualised and are thought to operate as complex self organising systems – the same thinking that allowed the modern concept of sustainability to emerge. It is best known in its application as adaptive management which acknowledges a level of inbuilt uncertainty in system behaviour and plans interventions as experiments backed up by strong feedback loops into decision making. Under this type of management decisions are regularly reviewed and adjusted as new information on system behaviour is obtained.

More recently the same thinking has been applied to governance. Under adaptive governance collaboration becomes important particularly across scales and two new principles of governance - adaptability (the ability to manage resilience) and transformability (the ability to manage a shift to a whole new system when the old system is no longer tenable) – come to the forefront of concern.

If resilience thinking is about embracing diversity variability and change then adaptive thinking is about governing and managing for change. The two paradigms therefore share some common heritage and are closely related.

One entry point for this project is a set of adaptive governance principles originally developed by the *Pathways to good practice for NRM governance* project and recently modified by Griffith and Davidson drawing on connections between governance and resilience. The second entry point is work by Olsson and colleagues on readiness for change, adaptability and transformability which involves networks that effectively have permission to explore alternative futures. Here there is considerable overlap with the collective thinking paradigm.

2.2.3 Collective thinking

The entry point for collective thinking in this project is Valerie Browns book *Leonardo's Vision* and a later set of principles developed by the same author. According to her, collective thinking is synthesis thinking rather than analysis thinking. That is (like resilience thinking with system drivers and behaviour) reverses the current mode of dividing complex issues into separate parts in the social sphere, and then having special interests dealing with those parts.

It sets up a collaborative team to apply principles of collective thinking. These principles are:

1. Respect for other's ways of knowing: their sources of evidence and tests of truth.
2. Reflection on and critical consideration of one's own thinking;
3. Learning to hear community voices and recognise their key icons and symbols;
4. Translation of specialised research into commonsense questions;
5. Transparency of the values and interests of influential organisations (including one's own); and
6. Shared clarity of purpose (not necessarily consensus)

It is expected that this view of collective thinking will add value to both resilience and adaptive governance paradigms.

2.3 Adoption of resilience, adaptive governance and collective social learning tools

It is not the intention of the research team to build new tools for application in the Transformation Project. Rather they will be introduced by the 'expert' that developed them or assisted in their development. For example, resilience thinking will be introduced by Dr Walker via a workshop based on the Resilience Alliance Workbook, adaptive thinking will be introduced by Professor Curtis, Dr Measham and Dr Griffith from frameworks that they each have worked on while collective thinking will be introduced by Professor Brown via the Collective Social Learning Spiral drawn from her book: Leonardo's Vision.

This is in keeping with the partner's request to be shown how to do assessments and apply the new thinking and to set up their own ongoing systems.

Ultimately though each of these tools will be tested and critiqued from the perspective of the other two paradigms. This research may develop three more comprehensively equipped tools for wider NRM distribution that better incorporate the other perspectives or it may end up with something emergent and therefore new.

3 Scoping Study Deliverables

The key deliverables for the scoping study are set out in the contract schedule. Each of the deliverables is presented below.

3.1 A review of relevant SIRP project findings

As this project is a synthesis project a review of related research funded through the Social and institutional Research Program at LWA was undertaken to ensure that the current project does not cover old ground and at the same time builds on the findings of past research particularly in relation to regional NRM and local government.

The LWA website (http://www.lwa.gov.au) has a facility for searching previous research. While almost all LWA research is relevant in some way to this project six projects in particular were been selected for review. These are:

- *Resilience: Enhancing local government capacity in Natural Resource Management* – undertaken by Su Wildriver through CRES (now the Fenner School) at ANU. Su's work with 28 local governments around Australia demonstrated that the relationship between local governments and NRM agencies is patchy and for the most part problematic. A checklist developed within the project for providing excellent NRM partnerships with LG and the priority issues for LG will both be useful inputs to the transformation project.

  The *Transformation Project* has already opened up the institutional space between NRM regional bodies and local governments in Nth Queensland, Southern Victoria and the ACT via a partner engagement workshop. We, like the researcher in the above project have found the space open for collaboration and have now put in train processes to enhance collaboration and develop new more adaptive governance arrangements between these two important institutional scales

- *Pathways to good practice in regional NRM governance* – undertaken by a team from UTAS and CSU led by Michael Lockwood. This project developed a set of principles for good NRM governance working with an expert panel, 9 regional NRM partners, two state government agencies and the national NRM team. The assessment tool developed by the project including the updated adaptive governance aspects will be valuable as an input to an adaptive governance framework for the transformation project.

  The *Transformation Project* will build on the UTAS work incorporating the principles of good governance and particularly the new work in that project on adaptive governance and preparing for significant change into an adaptive governance assessment framework for developing governance baselines in each of the partner collaborations.

- *Exploring key attributes and standards of a model for quality assured NRM* - undertaken by Rod Griffith and a team from CSU. This project assessed the links between good governance and effectiveness in regional NRM bodies and their effect on investor confidence. The standards recommended are based on an adaptation and extension of the NSW Standard for Quality NRM which as recent work has uncovered is actually an embryonic standard for adaptive governance and adaptive management, will be also useful in developing an adaptive governance framework for the transformation project.

  More recently the BPI project findings were used to re-examine the NSW Standard and to demonstrate its strong links to capacities for managing resilience and to adaptive governance. In conjunction with the UTAS work a clearer understanding is now emerging between adaptive governance, adaptive management and resilience.

The Transformation Project will incorporate this recent adaptation and reframing of the NSW Standard into it adaptive governance baseline assessment framework.

- *Change and Continuity in Peri-urban Australia* – undertaken by Michael Buxton (RMIT) and Darryl Low-Chow (Griffith). The project identified a new type of development - neither wholly rural nor urban which is now widely established in many parts of the Australian landscape. The issues identified and the characteristics of these settlements will be of vital interest to at least two of the partner collaborations that are concerned with current low levels of engagement of peri-urban landholders in NRM and their relationship with the rural landscape and other landuses.

- *Engaging Stakeholders in NRM Practice Change* – undertaken by Janelle Allison and team from the University of Queensland. This project developed some of the tools and frameworks for the project below.

- *Making Successful Investments in NRM Practice Change* –still being undertaken by Sue Salvin and team from Hassall & Assoc (Now GHD). This is a long term marquee project. The project shares a concern with adaptive thinking with the Transformation Project couched in this case as adaptive management. It aims to improve the capacity of regional NRM bodies to plan, manage, review and adapt their investments and strategies for practice change leading to improved natural resource condition. It also aims to influence policy makers.

  The tools and processes developed around project logic, M&E and implementation of strategies may be of use to partners in the Transformation Project as they design and implement their intentional transition to sustainable resource use. These tools will certainly be introduced to partners. At the same time the experience in our team and tools used for collective social learning are intended to add value to the community engagement aspect of the practice change project and a resilience and adaptive governance perspective may reframe the goals and objectives of practice change.

  There is a case for maintaining close links between these two research teams.

3.2 The challenges of partner collaboration

One of the aims of this scoping study was to engage partners fully in the project. This included engagement of committed and undecided partner organisations with the research team as well as engagement with each other through collaboration across regional and local scales and through processes common to all three regional/local collaborations.

The primary means of achieving this engagement was a workshop held in Canberra in late January 2009 with follow up meetings on site in Nth Queensland, Southern Victoria and the ACT between 24th February and 4th March 2009.

3.2.1 The partner engagement workshop

The workshop design was based on the collective social learning workshops that are intended as the synthesis workshops to be used in the transformation project (see Scoping paper 3). This workshop served a threefold function:

1. A team building process --which will be replicated at intervals during the project to facilitate cross-site social learning between partner organisations and researchers.
2. To establish the conditions for collaboration -- between regional NRM and local government partners in the three regional/local study areas and to draw out and share both the wicked NRM problems that are being faced by the partners and some projects that could be used to apply resilience, adaptive and collective thinking to these wicked problems.
3. Pilot the workshop process.

The workshop was very successful in all three of its intended purposes. Participants reported benefit from the opportunity to discuss their wicked NRM problems with each other and to gain appreciation of NRM and local government activities in vastly different geographical and functional areas of Australia. They also recognised the institutional space between regional NRM and LG as largely vacant and enthusiastically entered into the collaboration projects around shared NRM problems to manage that space. Participants were also appreciative of the efforts of Valerie Brown as facilitator and a brief evaluation session at the end of the workshop delivered quite positive responses from participants about the suitability of the workshop design for developing social learning networks in their collaboration projects.

The agenda, participants and outputs of the workshop can be found at **Attachment A.**

3.2.2 Site visits

Several new potential champions attended these meetings (as well as those champions that attended the Canberra workshop) providing the opportunity to re-present and discuss the key ideas of the proposed transformation project. The reaction of the 'new' people (a Board member, the Mayor and CEO of one Shire, a planner, community engagement manager and water quality advisor) was generally very positive. They strongly support the need for this type of project preparing for significant change, the participative action research approach and the matching of expected outputs and outcomes for the partners with their need for practical tools.

A presentation to the Southern Victorian partner meeting at the Surf Coast Shire offices in Torquay is at **Attachment D**.

The end result of these engagement activities is that regional NRM bodies and local governments in the three study regions have now committed to the transformation project for the next three years. This commitment includes both cash and substantial in-kind resources. An outline of the proposed collaborations between regional NRM bodies and local governments in Nth Queensland, Southern Victoria and the ACT are

set out in sections 3.2.2 – 3.2.5. A set of criteria developed by the research team to evaluate the case study proposals is provided below.

3.2.3 Case study assessment criteria

The criteria are:

- Has to be a wicked problem associated with linked social-ecological systems
- It is the type of NRM problem that has wider relevance around Australia
- The solutions tried so far don't seem to be working - presenting an opportunity for transformation
- The collaboration space between regional and local offers potential to deal with the wicked problem
- The organisations have existing or planned projects that are adequately resourced to use as applications of the thinking (there can be more than one – and ideally nested or interlinking)
- The scale of the project portfolio is manageable for researchers (geographically, temporally and community numbers)

The case studies for each of the regional/local collaborations meet the criteria as follows.

3.2.4 Nth Queensland collaboration

The partners in this collaboration are Townsville City Council (TCC), Burdekin Dry Tropics NRM (BDT) and Terrain NRM (TNRM). It is expected that Hinchenbrook Shire Council will also be involved as one of the collaboration projects covers parts of that Shire and may progress to a partner in the project over time.

The partners have slightly different perspectives on wicked NRM problems but share a mutual concern over landscape processes, development patterns and the decline of the World Heritage Areas – the Great Barrier Reef and Wet Tropics. From a Terrain NRM perspective the institutional arrangements with LG are ad hoc and result in high transaction costs and low success rates of investment in these land and water management issues. The BDT NRM is concerned about wetland chain management and the relatively low levels of engagement in NRM in peri-urban areas near Townsville and of Indigenous groups. TCC which covers over 3000 sq km has many already articulated problems rolled up under their 'solar city' banner including those issues identified by the two NRM partners. All agree that the silo approach is failing and that a different perspective on these problems is both timely and necessary.

Two case studies have been proposed nested under this broader banner of (solar driven) landscape to reef processes - where 'solar' is used in a wider ecological context rather than a narrow energy source context. One is set on the coastal area in the Burdekin Dry Tropics region south of Townsville, adjoins an area proposed for significant rural to urban transformation and includes a significant area of peri-urban settlement and more traditional north Queensland primary industries like sugar cane interspersed with wetlands and vegetated ranges. The second area is north of Townsville extending into Hinchenbrook Shire and covers part of the Wet Tropics World Heritage area of rainforests and wetlands. Both areas have links to the GBR.

The partners have committed resources to undertake these collaborative projects. They are all keen to undertake a resilience assessment of these two landscapes and communities and are open to transformation of both governance arrangements and landuses. All partners see the benefit of a social learning approach and of developing an enduring social learning system.

From a research perspective the selection of two case studies poses logistics challenges. However there are three existing partners and a potential fourth partner and a larger number of champions have come forward than was expected which will spread the load. Also cash contributions totalling $21,000 for the first year and significant in-kind support including staff time to the project will enable the duplication of some workshop processes though others may have to be run as a joint exercise with the ability to cover multiple projects. The coverage of different scales is not a problem. The concepts we are introducing in this project all have an inbuilt acknowledgement of nestedness – the influence on structure, function and feedbacks across scales so the bigger landscape to reef issues will be covered anyway by the resilience and governance assessments at the case study scale.

This proposed collaboration fits neatly with the project objectives and addresses many of the wider NRM issues faced by other NRM regions and local governments around Australia including Indigenous engagement, governance, engagement of peri-urban communities in NRM, wetland management in the landscape, biodiversity and agricultural practices including sugar cane farming. It is also expected to have relevance to other regions with an interest in the GBR.

3.2.5 Southern Victorian collaboration

The partners in this collaboration are Corangamite Catchment Management Authority and the Surf Coast Shire Council. Corangamite CMA were also a partner in the Pathways to good practice in regional NRM project and are keen to add further value to that learning.

The Surf Coast Shire is the major coastline of the Corangamite region and is facing major social, economic and ecological change from growth pressures and climate change. From the regional perspective the CMA has invested substantially in coastal zone management, agricultural practice change, biodiversity and water quality project and programs in the Shire as well as seeking to engage the Surf Coast communities in NRM. These investments have the potential to be lost in attempts to cater for ‘sea change’ demand. From the Shire perspective there is a need to become more prepared for climate change and the potential for forced transformation of the coastal zone. This includes emergency management particularly bushfire readiness. At the same time a transformation of another type is being forced upon the community – that of significant growth to icon townships which may threaten the surf Coast identity as a recreational/ rural icon.

To address these two different perspectives on the shared wicked problems the partners will collaborate to examine the resilience of current landscapes and communities and the alternative futures in the Torquay area which includes the urban area, a portion of the coastal vegetation communities along the great Ocean Rd,

farming lands to the north and west of Torquay and the coastal and marine environments including icon surfing spots like Bells Beach. Both partners are committed to a transition to a more sustainable form of resource use in the face of significant change and see that readiness for such changes will be essential.

This single case study meets the criteria developed for case studies in the project, there are a number of champions for the project at senior levels within each partner organisation and the logistics are manageable. Both partner organisations have committed cash ($20,000/y in total) and considerable in-kind support to the project.

3.2.6 ACT region collaboration

NRM in the ACT is an unusual perhaps unique context for the study of change in social-ecological systems. In the ACT, the management of the majority of public land is in the hands of the Department of Territory and Municipal Services (the 'local government' agency) and more specifically the responsibility of Parks, Conservation and Lands (PCL) -functions normally devolved to separated local governments in the States. Added to these institutional arrangements (an unlike the Northern Territory) the ACT is small in area and dominated by two landuses: urban (the nations capital city Canberra) and national parks and reserves covered in more or less native vegetation.

The collaboration in the ACT is between the NRM Council and the Department of Territory and Municipal Services. The ACT NRM Council has proposed a vision for the ACT that will lead to a more sustainable ACT. This vision calls for the ACT to lead by example; work together, address priorities whilst retaining a distinctive identity as the bush capital in Ngunnawal country.

The ACT is seeking to achieve transformational and sustainable change in management of parks and reserves, in the way the community contributes and how they learn from and work with the local Indigenous community. The partners consider the following three cases studies will benefit from the Transformation for Resilient Landscapes and Communities project, which each bear on the responsibilities of PCL.

Mulligan's Flat/Goorooyaroo and the 'Greater Goorooyaroo' project

The ACT Government, through PCL, is working in the ACT with research, community and industry stakeholders to protect conserve and enhance a significant lowland grassy woodland community. This includes creation of a fenced sanctuary, employment of different management treatments and the engagement of the local Gungahlin and wider ACT community. This work is underscored by a robust research platform to measure and understand the changes that will occur to the area in the long term. The addition of the 'Greater Goorooyaroo' component, where areas of connected and island remnants on private and public land in the NSW over an area of 35,000ha will have similar management treatments applied to them, including removal of predators, introduction of ground litter, control of introduced plants etc

The 'Greater' project provides the opportunity to engage a diverse community of rural lessees (in the ACT), rural landowners and rural residential dwellers (in NSW) as well as the urban community in Gungahlin. Key stakeholders in NSW state and local

government as well as ACT Government officers will also be engaged through the project.

An exciting dimension of this project, which also relates to the Indigenous Partnership case study below, is the use of cultural mapping to identify and respect Indigenous values in the project area. These values will then be acknowledged and celebrated in the evolving management of the 'Greater' area.

Resilience is also strong theme. The treatments, the connection of landscape units, the consistent and coordinated approach over a large area (irrespective of land tenure) and the engagement of a diverse and broadly based community will hopefully build a more resilient landscape and ecosystem. Resilience is also being sought in resourcing the work, by seeking out new funding models (such as a foundation or trust) that reflects the vision of the project - rebuilding resilient ecosystems with resilient resourcing with an engaged community of interest.

The NRM Community Landscape – Community Based Sustainability Action

The second case study relates to the continuing need for our community NRM structures to change and adapt to the needs of the NRM resource and our deepening understanding of the best ways to organise people to address these needs.

The current structures for community engagement and support are more then 10 years old and are founded in the 'Landcare' and urban bushland group model. The ACT community, like elsewhere, are now broadening and deepening their understanding of the environmental and sustainability issues confronting each community. Groups are now forming in Canberra with a focus on sustainable living, on reducing the ACT's ecological footprint.

Funding policy by Governments, particularly the Commonwealth, requires community organisations to focus on how local actions contribute to achieving national targets and priorities. Funders are seeking larger, coordinated, collaborative projects with discrete outcomes.

Reshaping the NRM community landscape to respond to the challenges of climate change and sustainability will require transformative change and this project can contribute to the making of this change through social learning approaches.

The ACT Indigenous Partnership

The third interrelated case study is to initiate a 'new deal' for Indigenous engagement and participation in the ACT land management. The Ngunnawal Indigenous community in the ACT negotiated a co-management agreement with the ACT Government as part of the settlement of a native title claim for Namadgi National Park. The ACT NRM Council is working with PCL to develop a deeper and more practically grounded arrangement. The current co-management arrangement has not been overly successful due to the need to meet the interests and concerns of individual families and because of it single dimension approach to engagement.

The 'new deal' involves tackling the triple bottom line of engagement: social well being, economic prosperity and environmental improvement and includes creation of an Indigenous Reference Group, employment of two Indigenous 'Green' teams tackling on-ground problems in an outdoor learning environment, certificate level training, cultural mapping and cultural activities.

The proximity these case studies to the research team opens considerable opportunity to test the tools without incurring travel costs and so that the whole research team can be involved in each step of the process. While champions in the local government functional area of the government have been engaging with caution momentum is now building on the basis of a clearer understanding of the project dynamics and outcomes.

3.3 Scoping papers

Prior to the Canberra workshop the research team had prepared three scoping papers. These were:

> **Scoping paper 1**: Towards sustainability: Transition, transformation and incremental change
> **Scoping paper 2**: adaptive thinking resilience thinking and collective thinking as inputs to transformational change
> **Scoping paper 3**: Collective thinking and social learning: Pathways for transformational change

These papers were conceived as both a literature review device and as a way of informing partners on the resilience, adaptive governance and collective social learning. These papers were envisaged as works in progress that would mature as deliverables in a package of supporting material to enable partners and wider NRM audiences to use the tools developed in the project.

While that aim may still be applicable it was observed during the Canberra workshop and reinforced by partner comments that the partners did not relate to or respond well to this type of communication device. It became apparent that partners are more in tune with the workshop style of learning by doing. Partners have specifically requested that the research team conduct workshops in their regions to demonstrate the concepts and at the same time transfer skills to the partner organisations.

Accordingly little additional work has been done on the scoping papers. Instead effort was diverted to developing a workshop sequence that would meet the partner requirements without undermining the project integrity and keeping within the budget limits.

Dr Walker has agreed to run a workshop in each of the partner regions based around the Resilience Workbook which will also cover adaptive governance ideas and principles. The workshop will serve multiple purposes:

1. Enable participants to become familiar with the concepts of social-ecological systems, resilience and adaptive governance

2. Develop social-ecological system maps or rich pictures which will be used as contributions to the baseline of readiness in each collaboration
3. Expose participants to resilience assessment techniques for current and alternative future systems
4. Examine choices between adaptation and transformation

Professor Brown will then follow up with a collective social learning workshop (based on her collective social learning spiral as used and tested in the Canberra workshop) which will function as a synthesis process to incorporate information and ideas developed in the resilience/adaptive governance workshop into a collective social learning experience. This workshop will also develop an action plan for transformation to adaptive governance and a transition to sustainable resource use (adaptation or transformation).

Both Dr Walker and Professor Brown will run comparative workshops after 18 months implementation to synthesise cross site learning.

In this way each partner and their communities will be exposed to resilience, adaptive governance and collective social learning and the champions will have the opportunity to closely interface with world recognised experts and learn more about the implementation of these key workshop tools.

This workshop sequence has been incorporated into a refined research design (see Section 3.4 below). The scoping papers have remained at an early stage of development as 'works in progress' and are at **Attachment B**.

3.4 A project in progress fact sheet (ANNRO listing)

The scoping process has helped to refine the project design, the participative action research framework in which the project will sit as well as the appropriate sequencing of workshops (as discussed in the previous section) and contacts between partners and the research team.

This project brings together three different albeit overlapping paradigms or conceptual frameworks – Resilience, adaptive governance and collective social learning. To use any one of those as the driving framework of the project would privilege that paradigm over the other two. To overcome that situation a participative action research model developed by Waltner-Toews and Kay for research on ecosystem sustainability and health (AMESH) will be modified and adopted as the overarching conceptual framework for this project. The AMESH framework acknowledges the place and legitimacy of all three paradigms, employs a holonocentric, soft systems approach and has been tested and refined in practice.

The most recent outline of the *Transformational Change for Resilient Landscapes and Communities* project is now articulated in a PROJECT IN PROGRESS FACT SHEET using the LWA template and can be found at **Attachment C.**

4 Summary of Findings

Overall the scoping phase of the *Transformational Change for Resilient Landscapes and Communities* project has been very successful.

The partners have formally committed to and become tightly engaged in the project and are keen to start on their respective collaborative case studies. They have expressed great support for the participative action research approach – clearly not having a say in the development of R&D projects and being used as research guinea pigs is wearing thin. The Canberra workshop and follow up material and visits have convinced not only the initial champions but also other decision makers in the partner organisations that this process is genuine and they will have a real say in the project direction and progress.

The partners have also entered into collaborations and new governance arrangements with their neighbouring NRM or Local government organisations with enthusiasm and real purpose. There have been many comments from champions and new participants (including Mayors and Board Members) that attended the follow up site visits that this type of cross-scale collaboration is long overdue.

Partners have also developed and expressed confidence in the potential of resilience thinking, adaptive governance and collective social learning and the tools we have chosen to make a real and practical contribution to tackling wicked NRM problems and in making a transition to sustainable resource use.

It is most important that this momentum is not lost and that we are able to focus the enthusiasm.

The case studies proposed by the partners are real time, real life cases of urgent NRM problems that cannot be successfully addressed under the current NRM paradigm. Not withstanding that, these case studies cover many of the NRM landscape management and community engagement issues faced by many other NRM organisations including local governments. As such there is now confidence that the experiences of the partners over the next three years will become valuable aids to transfer of this approach to other NRM regions throughout Australia.

From a research perspective there is now a strength of purpose among the research team and a sense of excitement that the concepts and the overall design and approach have found strong resonance with the partners. We think the partner engagement and involvement in the scoping phase has been particularly useful in tightening the research focus and delivering a workable and achievable project of national significance. We have been able to respond quickly to requests for workshops rather than written information and the project is richer for that input. The case studies also promise a rich source of academic knowledge and learning.

Any concerns that the project is just an esoteric exercise can now be confidently put aside. It is clear from the case study projects chosen by the partner collaborations that the outcomes will be both deeply practical and highly innovative. The new design is achievable within budget given additional partner cash and in-kind contributions and the partners and research team are keen to embark on this project.

5 Attachment A

5.1 Partner engagement workshop outcomes

Outcomes from the 1st Social Learning Workshop

Venue: University House, ANU
Date: February 22 2009

Facilitator

Valerie Brown

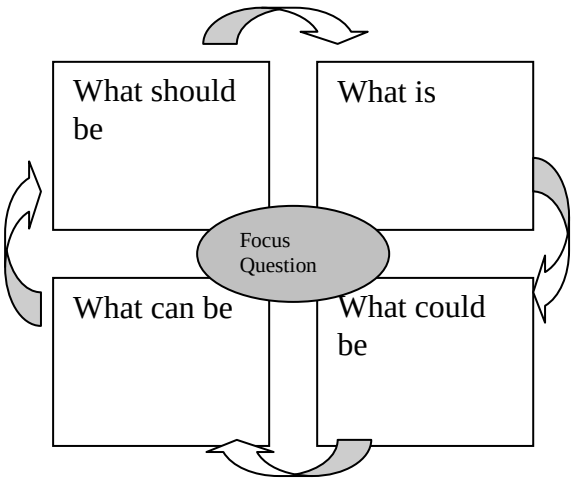
Participants

Greg Bruce (Townsville City Council)
Allan Dale (Terrain NRM)
Bob Frazer (Burdekin Dry Tropics NRM)
Peter Codd (Corangamite CMA)
Rowan McKenzie (Surf Coast Shire)
Sarah Ryan (ACT NRM Council)
Anna Van Dug (ACT NRM Council)

Rod Griffith (CSU)
Allan Curtis (CSU)
Tom Measham (CSIRO Sustainable Ecosystems)
Brian Walker (CSIRO Sustainable Ecosystems)
Carmel Pollino (ANU)
Sandy Robinson (Sandy Robinson & Associates)

Workshop design

Browns Social Learning Spiral



Focus question

"For the goal of sustainability: how can we effectively use the current space between local and regional scales"?

Workshop Agenda

DAY 1 – Wednesday 21 January - Dinner: The Drawing Room

7.00pm	Welcome Drinks
7.30pm	Dinner – Introduction of each member to all members

DAY 2 – Thursday 22 January - Workshop: The Drawing Room,

8.30 am	Coffee and Tea on arrival
9.00am	Brief presentation and discussion on the three background papers: 1. Transformation 2. Adaptive, resilience and collective thinking 3. Collective social learning – a methodology for transformative research
9.30am	What should be? (regional groups)
10.30am	Morning Tea – participants look at outcomes of other groups
11.00am	What is? (regional groups)
12.00pm	Members explain their issues to the other groups
12.30pm	Lunch
1.30pm	What could be? Informal brainstorming session (mixed groups)
2.00pm	What could be? Document ideas (mixed groups)
3.00pm	Afternoon Tea – participants look at outcomes of other groups
3.30pm	What can be? Immediate next steps and realistic timetable for next 3 years. Indicators of change or success. (regional groups)
4.30pm	Each group presents its regional strategy – 5 mins each
4.45pm	Evaluation of the workshop process
5.00pm	Next steps – 10mins
7.00pm	Dinner – Venue to be agreed during the day

Reponses from three study regions

What should be? -- A statement of ideals around the collaboration

Southern Victoria	Nth Queensland	ACT
Theme: Personal qualities required for transformational change **Humility** • Appreciate limits to knowledge **Love and respect for Earth** • Respect for the Earth's awesomeness • Society □organization that it lies within the Earth's environment • Natural environment is of equal or greater importance to the social **Respect for each other** • Public policy process respects communities • Everyone is capable of innovation and change • Appreciation of diversity and difference • Respect for diversity of opinion • Respect for each other's values • Collaboration based on this respect • Collaboration based on learning moving to action **Learning** • People become involved in action to address unsustainable practice • Space/time for open debate/ discussion • Continual learning of holistic systems (adaptive/feedback loops) • Transfer and sharing of knowledge (innovative solutions, creative, brave, committed) • Shared collective thinking between peoples **Courage** • Show courage when it matters most **Altruism** • Seek rewards but not at the	**Theme:** Multiple-interest integration across multiple scales **Local collective action** • Personal communication and lots of small actions • A connected ecologically protecting and valuing community, with substantial meaningful collaborations • Experiential, collective social learning and education that connects us to the whole • A cultural shift to resolve the source, not the symptoms • Transformational taboo should be overcome • Tuned in to social and ecological change **Scale integration** • Society human not production centric • Greater well-being from balance between values • Enable and foster innovation and experiments **Social integration** • Regional capacity to broker local to wider world • Consider multiple social and organisational scales and their cross-linkages **Alternative futures** • Have a long-term (multi-decade) perspective • Common vision leading to collective action • Sustainability funding and policies gives equal status to health, education and defence	**Theme:** Changes in governance **Building a sense of a sustainable place** • Respect for place (Canberra's environmental history) • Sustainable natural resource management core to ACT land use planning • A stronger shared vision for sustainability in the ACT **Following a learning agenda** • Sustainability learning journey continue in the ACT • Practicing closed system consumption especially water use • ACT residents value sustainable housing • Canberrans halve their ecological footprint • ACT people moving around with zero carbon emissions **Ensuring equitable collaboration** • Cooperation among local and regional actors • Indigenous people equal partners in natural resource management **Improving governance** • Mobilising civil society • Biophysical boundaries influence political boundaries

expense of others • Accept altruism as a sign of strength, not weakness.		

What is? -- Force field analysis of factors supporting or inhibiting the collaboration

Southern Victoria	Nth Queensland	ACT

Supporting factors
• Capable and well-educated community
• Sophisticated capable leaders
• Established effective local network of organizations
• Stable and well-functioning society committees
• High level of well-being
• Willingness of people to contribute to public
• Strong community groups: local food, primary schools, conservation groups
• Environment is in good condition – can be managed.
• Strong sense of place.
	Supportive factors
	• LGA leadership (Creek to Coral, City Solar, etc) TCC Integrated Sustainability Services
	• Regional leadership (Reef Rescue partnership)
	• Collaboration between regional bodies (Bioregional pest management strategy, Burdekin 180 projects delivered via partnerships)
	• Networks: Burdekin OT, Townsville NTEP, Carbon Townsville, Cairns Tropical Knowledge, AGOF, twinning projects in Thailand, China, India. Community-based NRM groups (Landcare, Catchment Management, sub-regional groups)
	• Strong scientific and technical resources (Solar cities, JCU etc)
	• Meaning making strategies (Thematic Communication)
	  o Collective social learning strategy
	  o Resilience Alliance (ARC coral reefs and rainforest)
	  o Climate change debate
		Supporting factors:
		• Bush capital concept
		• Educated community
		• State and Local Government combined
		• Environmental NGO's are competent and effective
		• Socially cohesive, relatively (environmentally) respectful community
		• Urban open space to support biodiversity
		• Better access to specialist knowledge/research community
		• Proximity of open space and rural environment
		• Proximity to national government decision-making
		• Affluent community

Inhibiting factors • Poor sustainability indicators and feedback systems • Policy avenues and implementation arms are disconnected, to an extent • Failure of state policies to support collaborative initiatives at the regional scale • Local groups believe that they are being disempowered by	**Inhibiting factors** • Don't understand negotiation and so don't practice it successfully • Lack of cross-scale awareness and connections • Lack of leadership and direction at 'local' scale • No alignment between stakeholder activity, plans and effort • Fear of change – state of denial • Lack of continuity of	**Inhibiting factors** • People very busy • Existing structures (agency silos, land managers farming, NRM, sustainability • Lack of public investment in the region • Poor information-sharing processes • Disjointed environmental planning • Chief Minister micro-manages

government • Absentee ownership • Lack of diversity in ethnicity and ideas • Addiction to fossil fuels and to consumption • Strong urban/transient interests • Lack of alignment of priorities between organizations • Funding is project-driven, limiting collaboration (no discretion) • Conflicting ideas of sustainability • Wrong view about what will make us happy • Complexity leading to inertia • Poor social learning system	resources • State government not providing leadership to agencies • Lack of good process/framework for transforming current situation • Dealing with immediate issues to the detriment of longer-term related actions • Lack of corporate social responsibility and attitudes to corporate philanthropy • Development ethos in Local and State Government, industry, and community. • Lack of holistic training, and right brain practice • Inability to influence policy from region (power lies with State and federal Gov't) • Little or no strategic, connected approach to water, energy, waste, built capital, nature • Lack of awareness of personal responsibility for impact of climate change	• NRM Council has no buy-in from/sense of ownership by ACT land managers • Transient component of population (parachuting) • Poor housing design • Dispersed urban structures (poor transport systems, loss of biodiversity, social isolation) • Culture of serving the nation rather than local • Affluent community

What could be? -- Innovative ideas for the collaboration

Mixed Group 1	Mixed Group 2	Mixed Group 3
• Give community a voice- all underrepresented groups through well-established processes (e.g. reference groups) • Set up adequate communication systems e.g. story-telling, web space, inspiring speakers, collaborative research, action research, networks, • Learn by doing, listening to stories, open space technology (Viv McWalters), meaning making (Sam Ham), social learning, experiential learning • Support local organisations in real action	• Have action elements drive the transition system • Include rogue operators and independent thinkers • Recognise narrow windows • Independent local initiatives (farmer's markets, • Find the Tiller Arm (Buckminster Fuller) • Townsville Network Demand Management • Revisit and remake the rules • Develop emergent cultural symbols • Reconsider our own organisational behaviour, • Provoke non-linear conversations, work with Gladwell's 'Tipping Point" : • Need not a campaign but a	• Work with ten attributes of collective change • Resilient thinking • Adaptive governance • Collective learning • Food supply chain • Innovative leadership • Establish mental models of above. • Identify shocks and drivers, and long and short term goals for the above • Resilience analysis for the area o Thresholds of potential concerns o Functional diversity assessment o Systems thinking • Place and people-based sustainability indicators of

	movement • Create lots of small actions	what would make people act • A historic profile of the region identifying insights into possibilities • Community conversations: o What is important to you? o What do you value most? o What do you identify with? o What could threaten those values? • How could we change so we will be less vulnerable?

What can be? -- Action plans for the collaboration

Southern Victoria	Nth Queensland	ACT
What sustainable state will Torquay transition to? 1. CCMA, SCSC to agree to sponsor one to two year community discussion 2. CCMA, SCS Tranny Team to negotiate a process 3. Seek public commitment from key stakeholders to participate 4. Establish local steering team 5. Run process 6. Evaluate 7. Report **Cross site learning** ▪ Access to project team through single point e.g. Rod ▪ Minimum of two project meetings per year (in Canberra or regions) ▪ A forum involving all project team (invite O/S experts)	**Own site** 1. Up front intense staff training a. Team building workshop b. Staff training 2. Preparatory/content setting workshop for solar city and Hinchenbrook Shire Council 3. Transformative change workshop Solar City and HSC 4. Second phase transformative change workshop (together) 5. Third phase evaluative workshop 6. Regular Terrain, Burdekin DT, TCC team interaction 7. Report **Cross site learning** ▪ Person to support (project contact ---- Rod) ▪ Intense training in collective social learning for staff (Val and Brian) ▪ Support for a series of social learning workshops for key stakeholders groups (e.g. Solar Cities, Alligator Creek community)	1. Conversation with potential partners – agreement on participation and project (governance or another one) – end of Feb 09 2. Map current governance of NRM in the ACT – end of March 09 3. Detailed project planning including rules of engagement of partners – end of May 09 4. Gain political support -- end of May 09 5. Forums/workshops with wider stakeholders (test our assessment of the current situation, develop vision, objectives and actions – end of Dec 09 6. Develop draft proposal – end of May 2010 7. Consult more widely review proposed new arrangements, finalise and publish – end of Nov 2010 8. Conversation with potential partners – agreement on participation and project (governance or another one) – end of Feb 09 9. Map current governance of NRM in the ACT – end of March 09 10. Detailed project planning including rules of engagement of partners – end of May 09 11. Gain political support -- end of May 09 12. Forums/workshops with wider stakeholders (test our assessment of the current situation, develop vision, objectives and actions – end of Dec 09 13. Develop draft proposal – end of May 2010 14. Consult more widely review proposed new arrangements, finalise and publish – end of Nov 2010 **Resources needed** ▪ Advice, knowledge and expertise of research team

		▪ Facilitation of forums and workshops ▪ Linkage to international literature and case studies ▪ Facilitated cross learning with other sites

6 Attachment B

6.1 Scoping paper 1:

6.2 Scoping paper 2:

6.3 Scoping paper 3:

Please note that this important paper on the meaning of Transformation is still under discussion – we have included here the draft that was circulated to the participants at the Partner workshop in Canberra. However there will be change to both the structure and content of this paper as the discussions unfold.

Scoping paper 1: Towards sustainability: Transition, Transformation and incremental change

Transition overview – towards sustainability

Transitions can be defined as a continuous process of structural change within society as a result of multiple developments in different domains (Rotmans et al 2001). Understanding transition has become increasingly recognised as an important endeavour. This recognition occurred alongside the realisation that achieving sustainability (ecological, social and economic) requires moving from an unsustainable state to a sustainable state of a social-ecological system. In other words, transition towards sustainability implies a major change to a qualitatively different state. Complicating this is the uncertainty over what is sustainable and what is not. Yet, however we define these states, transition itself is emerging as a crucial activity, and recognising the need to change is part of becoming more sustainable. In this regard, sustainability can be seen not so much as a stage but as a process.

One of the main areas for studying transition has been concerned with technology and how technological change has affected society. Obvious examples are the petrol engine and personal computers which have had profound effects on our social systems. Researchers in this area have shown that initial update of technologies occurs in small niches, but at some point, these niche technologies can become the new mainstream. Trying to understand when and how this transition occurs has been the focus of researchers from the technology sphere. A similar interest has occurred in researchers trying to understand shifts to 'alternative' agriculture systems like Organic farming which are thought to be more sustainable than current mainstream approaches.

Another area of research to understand the nature of transition is concerned with tracking the shift from agrarian to industrial societies. Massive changes in resources use and consumption patterns have characterised this shift which have been analysed to help us understand how change occurs in socio-ecological systems.
Incremental change

Incremental change refers to improving a given system without fundamentally changing it to a different state. An example of this might be making vehicles smaller or more efficient to produce less carbon dioxide emissions. However, it has also been observed that transition involves change from one state of the system to a completely different state (e.g. where cars are not used at all). Because the shift from one system

state to another is a dynamic and potentially chaotic process, it has been suggested that incremental change will not lead to the type of change that is implied by a sustainability transition.

Transformation

Transformational change implies a much more fundamental change compared with that is suggested by incremental change. Transformation involves changes to the overall state of the system and how it works.

Transformation can be grouped into phases:

- Pre-development: Context for transition with no change in status quo
- A take off (or niche) phase: new phenomena emerge and status quo begins to shift
- An Acceleration phase: new phenomena and structures in contrast to the status quo
- A Stabilisation phase: the pace of change slows and a new status quo takes form

(Adapted from Rotmans et al 2001; Fischer-Kowalski and Haberl 2007)

Generally, transformation is associated with relatively long time frames, such as one human generation or greater.

Transition management

One way to look at transition is to view it as an emergent outcome of unplanned or spontaneous effects. In this regard, it could be suggested that the nature of industrial society wasn't the intended outcome of the socio-technical changes that caused this change, so much as a historical accident that stemmed from a myriad of individual, uncoordinated changes. An alternative position is that transition can be managed. The thinking underpinning 'transition management' is that some transitions can be traced back to distinct contexts, intensions and niches. These examples have inspired ideas that transition can be purposeful, if not manipulated. The role of context is crucial for any transition and there may be a possibility to manage transition where the existing status quo is under pressure to change. Proponents of 'managed transition' emphasise the role of guiding visions in order to map a 'possible space' and develop metaphors and narratives for change.

Further Information

DRIFT - Dutch Research Institute for Transitions http://www.drift.eur.nl

Fischer-Kowalski, M. 1. and Haberl, H. (2007). Socioecological transitions and global change: comparing historical and current changes in societal metabolism and land use. Edward Elgar, Northampton, MA

Loorbach, D. and Rotmans, J. (2006). Managing Transitions for Sustainable Development , In Olshoorn. X. and A. J. Wieczorek Editors Understanding Industrial Transformation: views from different disciplines. Springer, Dordrecht. Pp 187-206
Rotmans, J., Kemp, R., and van Asselt, M. (2001). More evolution than revolution: transition management in public policy. Foresight, 3 (1), pp. 1-17
Smith, A., A. Stirling, and F. Berkhout. The governance of sustainable socio-technical transitions. 2005; 34, (10): 1491-1510.
Stead, W. E. and Stead, J. G. (1994). Can Humankind Change the Economic Myth? Paradigm Shifts Necessary for Ecologically Sustainable Business. Journal of Organizational Change Management, 7 (4), pp. 15-31

Scoping paper 2: Adaptive thinking, resilience thinking, and collective thinking as inputs to transformational change

Rod Griffith
for the Transformation Project

Introduction

The *transformational change for resilient landscapes and communities project* is aimed at developing a better understanding about the factors influencing a transition to sustainable resource use in linked social-ecological systems. As natural resource and place managers at regional and local scales, the partners in this project have indicated that they are committed to such a transition as a contribution to the wider societal goal of sustainability.

This paper is the second in a series of three scoping papers.

The first paper is on the concept of a transition and other key ideas like the tension in change between transaction and transformation.

This paper introduces adaptive, resilience and collective thinking as change processes and as conceptual frameworks or paradigms. That is they are ways of conceptualising or framing those day to day tasks and longer term challenges that we all face as natural resource managers. They are inputs to a change process rather than outcomes (for example system resilience or adaptive governance or social learning) at this stage of the project. This is particularly important if transformation is seen as an option. Each way of thinking is complex, comes from different areas of academic study and has its own language that needs unpacking separately. Key terms are highlighted. There is considerable overlap between these modes of thinking and they are increasingly being thought of together. The paper draws out these connections before examining how these ideas could be usefully applied to intentional transitions to sustainable resource use in the linked social-ecological systems which are the study sites for this project.

The third paper covers collective thinking in more detail and introduces collective social learning in the context of participative action research methodology. All three papers are all works in progress and this is the very first iteration.

Why transformational change?

The emergence and refinement of the modern understanding of sustainability in the latter part of the 20th century has been made possible by the recognition of the inter-dependent linkage of social and ecological spheres and the development of a more complex and dynamic interpretation of systems thinking than was previously the case. Following this line of thought, **sustainability** in its wider sense is put forward here as *a systems based idea aimed at managing the relationship and linkages between social and ecological systems with the aim of perpetuity for humans*. Note that both

economic systems and governance are covered here for convenience under the social banner though we acknowledge that these spheres are more commonly separated.

In a narrower natural resource management sense Walker and Salt's conceptualisation that **sustainability** is:

'*the likelihood an existing system of resource use will persist indefinitely with out a decline in the resource base or in the social welfare it delivers*'

is generally accepted here as a starting point for further exploration in this project.

Despite sustainability being at the forefront of consideration by policy communities over the past 30 years at many scales from international cooperation to localised projects, these predominantly transactional efforts have generally failed to deliver on the wider promise of a sustainable relationship between humans and non human ecosystems. **Transactional** approaches attempt to *pursue the goal of sustainability from within modes of thinking and by using methods similar to those that have created and entrenched unsustainable relationships between humans and nature*. That is they attempt to fiddle at the edges of existing systems structure and function without challenge to the drivers and underlying assumptions. For consistency of terminology with resilience thinking transactional change will be referred to from this point on and in the project as **adaptation**.

Policy communities are belatedly turning their attention to the option of transformation as global threats like climate change become better understood and accepted. **Transformational change** is profound change and will most likely *require modes of thinking and policy instruments different from those that have led to the current unsustainable relationship*. While adaptation retains the system structure function and feedbacks and therefore identity, transformation is a shift to a whole new system with different structure and function and different drivers and feedback. The partners have also indicated that they are open to the idea of transformation as a means of making the sustainability transition.

Resilience, adaptive governance and collective social learning as ways of thinking about change

These ideas are deliberately portrayed here as ways of making sense of the world or even as paradigms in a more active sense. When considered together resilience thinking, adaptive thinking and collective thinking may be inter-dependent parts of a bigger idea which may be sustainability in another guise, a more robust representation of one of these modes of thinking or an as yet unnamed idea. This is something that is not so far described in the literature and for us to explore.

Each of these insightful ideas is covered in more detail below.

Adaptive thinking

Natural resource managers will be familiar with the mantra of **adaptive management** – *active experimentation, monitoring, reflection and learning*. It is much touted in NRM circles but seldom practiced in its entirety. Adaptive management is

underpinned by adaptive thinking. It emerged out of cognitive studies as experiential learning and from general systems theory but like many important societal ideas it has it roots in a number of different places which then converge. It also owes much to understandings of complexity which helped to enable complex systems thinking and to uncertainty. The argument is that complex self-organising systems like our landuse systems are both dynamic and difficult to know with sometimes obscure direct causal relations. Human interventions such as management actions and policy should therefore be seen and treated as experiments with some degree of uncertainty and the surprise inherent in the process and outcomes.

More recently adaptive thinking has been extended to **governance** - *the interaction between rules, structures, responsibilities, key relationships, processes and systems (but also informally values and traditions) which influence/determine:*

- *the way power and authority is shared and exercised*
- *the way decisions are taken*
- *the way stakeholders and communities have their say.*

If resilience thinking is about embracing change, disturbance and variability of processes, adaptive governance is all about being ready for change and understanding the key drivers and processes of change so that communities can either adapt or transform. **Adaptive governance** is therefore *governance for change and uncertainty*.

While principles of 'good' governance like legitimacy, accountability, transparency, justice are still relevant and important in all contexts including NRM, they are unlikely to be sufficient in the face of threats like climate change. Adaptive governance focuses on deliberative participation, inter-connectivity, adaptability and transformability. These governance principals recognise that NRM organisations are situated in a wider multi-layered and polycentric network of social agents and decision makers and that the social-ecological systems under management are dynamic and self-organising. They also recognise that interventions can generate winners and losers through distribution of benefits and consequences whether they are intentional or not.

Adaptability according to Lockwood and others is characterised by:

- *Networks across and between scales and levels as feedback loops*
- *In-built responsiveness to changing internal and external signals*
- *Systematic reflection on individual, organisational and system performance and improvement*
- *Anticipation and management of threats, opportunities and risks*
- *Incorporation of monitoring, evaluation, purposeful learning, alternative futures and innovation into decision making,*

Walker and also Lebel see **adaptability** as *the capacity of actors in the system to mange resilience.* This attribute is necessary when existing systems are delivering desired ecosystem services and social well being and can continue to do so. In this case improving resilience in the existing system is a good thing. However if existing systems are not and cannot, deliver those desired services and well being then

transformation or a shift to a whole new system needs to be considered. In this case resilience in the old system inhibits transformation.

Transformability then, is the *ability of actors in the system to manage transformation*. So transformability and adaptability are both key attributes of adaptive governance and have implications for managing resilience. Communities must make decisions about whether adaptation or transformation should be pursued.

It is becoming apparent that new deliberative capabilities will be required to manage adaptability, transformability, inter-connectivity and participation. Lebel, Olsson and Bellamy to name a few have identified some of these capacities including new forms of leadership with an emphasis on:

- encouraging and supporting epistemic communities and shadow networks to explore alternative system configuration,
- the ability to span scales of governance
- recognition and navigation of windows of opportunity
- integrating and communicating understanding
- reconciling different problem domains.

Adaptive management and adaptive governance are therefore two sides of the same coin and together are thought to be necessary to deliver effectiveness of interventions in a changing world.

Social learning also has roots in adaptive thinking. Dyball identifies five strands that are considered essential to social learning:

- A process of iterative reflection that occurs when we share our experiences
- Systems thinking as a powerful way of understanding the dynamics of change
- Holistic and integrative frameworks from which to investigate the world rather than ones that divide observations into a selected set of elements
- A constructive approach to negotiation which assumes that conflict generates opportunities for learning and concentration on collaboration
- Participation methods that foster multiple loop learning and synthesis.

Resilience thinking

Resilience thinking is systems thinking based around always changing, linked social-ecological systems. The term **resilience** like sustainability and other many concepts is a word in general use as well as in specific use in academic circles. This leads to a blurring of meaning and perceived definitional problems as the word is introduced into policy contexts.

It is defined by Walker and colleagues as *the amount of change a system can undergo (its capacity to absorb disturbance) and remain within the same regime – essentially retaining the same function, structure and feedbacks*. The implication is that the system will continue to produce the same ecosystem services. Indirectly it is these services that are implied in resource condition targets. So resilience is a good thing if a particular social-ecological system is in a desirable state and not so good if they are in an undesirable state.

Adger describes a second meaning engineering resilience as the amount of time a system takes to return to the original state. In policy circles we are already hearing agencies and managers taking of resilient landscapes as those resistant to change. In this project we are using the concept to open up change.

Walker and Salt explain resilience thinking as follows:

> "*In the broadest sense, optimising and controlling components of a system in isolation of the broader system results in a decline in resilience, a reduction in options, and the shrinking of the space in which we can safely operate. Resilience thinking moves us the other way*."

Some key points include:

- Social-ecological systems are complex adaptive systems that can exist in a few different stable states or regimes
- Though social-ecological systems are affected by many variables they are usually driven by only a handful of key controlling (often slow moving) variables.
- Along each of these key variables are thresholds; if the system moves beyond a threshold it behaves in a different way, often with undesirable and unforseen surprises
- Once a threshold is crossed it is usually difficult (in some cases impossible) to get back
- A system's resilience can be measured by its distance from these thresholds. The closer you are to a threshold the less it takes to be pushed over
- Sustainability is all about knowing if and where thresholds exist and having the capacity to manage the system in relation to those thresholds
- When managing resilience you need to be aware of two types of resilience: to the disturbances that you are aware of and the ones you haven't even thought of
- Adaptability describes the capacity of actors in the system to influence the systems trajectory relative to a threshold and the position of thresholds.
- Regime shifts are changes from on stable state of a system to another – transformation is the creation of a whole new system with different drivers and thresholds.
- Transformability is therefore the ability to mange transformations or shifts to a whole new system of say governance or landuse

Walker and Salt also set out nine basic characteristics that should be valued in a resilient world:

- **Diversity**- a major source of future options and system capacity to respond to change

- **Ecological variability –** including cycles of drought, flood and fire which have shaped the ecological systems
- **Modularity** – over-connected systems are susceptible to shocks and they are rapidly transmitted through the whole system
- **Policy focus on slow variables** – closely linked to thresholds that change regimes
- **Tight feedbacks** – allow detection of thresholds before we cross them
- **Social capital** – trust, strong networks and leadership accompanied by penalties for cheaters, that strengthen the capacity of people to work together and effectively to change
- **Innovation** – able to take advantage of opportunities during change
- **Overlap in governance** – increases response diversity and flexibility
- **Ecosystem services** – the things that change in a regime shift.

At the conclusion of their book the authors challenge readers to nominate a 10th valued attribute. Perhaps that is the acknowledgement of the importance of cross scale influences.

The term **resilience** like sustainability and other many concepts is a word in general use as well as in specific use in academic circles. This leads to a blurring of meaning and perceived definitional problems as the word is introduced into policy contexts.

It is defined by Walker and colleagues as *the amount of change a system can undergo (its capacity to absorb disturbance) and remain within the same regime – essentially retaining the same function, structure and feedbacks*. The implication is that the system will continue to produce the same ecosystem services. Indirectly it is these services that are implied in resource condition targets. So resilience is a good thing if systems are in a desirable state and not so good if they are in an undesirable state. Desirability of course depends on perspective so collective thinking or at the very least recognition that deciding about particular states of a system is a social activity which can have very different outcomes depending on how power is shared, how decisions are made and who has a say. In other words governance is central to decisions on resilience.

Walker suggests that four aspects of resilience are important:

- Latitude – the maximum amount a system can be changed before losing its ability to recover
- Resistance – ease or difficulty of changing a system
- Precariousness – trajectory and how close it is to a threshold
- Panarchy – how the above three are influenced by subsystems below and scales above.

These are key measures that need much more work. In policy circles we are already hearing agencies and managers taking of resilient landscapes as those resistant to change. Adger also describes a second meaning known as ‘engineering resilience’ as

the amount of time a system takes to return to the original state – more akin to the idea of resistance. In this project we are using the concept to open up change.

By way of caution, much of the resilience literature is couched in terms of heuristics (rules of thumb) and propositions rather than tight theory. One source of uncertainty is whether the heuristics developed for understanding the dynamics of ecological systems including panarchy and adaptive cycle dynamics also apply to social systems. Another is the nature of the linkage between social and ecological systems. In this project we intend to take a critical position on these issues. In that regard the empirical findings from the regional and local social-ecological systems managed by the partners and the critique generated will add to the emerging body of theory.

Collective thinking

Collective thinking is described by Brown as synthesis thinking – where **synthesis** is *a fresh whole developed from interacting parts*. The complementary processing of knowledge is analysis – which is a compartmentalising process.

Both of these ways of managing knowledge have origins as far back as Socrates and Aristotle. While Brown suggests that we all possess both capacities, analysis has become primary in western culture. It is this primacy and its expression in policy and action around NRM that Walker has called the paradox of efficiency and which has led to the call for resilience thinking. Collective thinking also has relevance to adaptive thinking and systems perspectives. The proposed leadership skill of orchestrating networks and integrating epistemic communities as part of adaptive governance has been raised earlier in the paper. Each epistemic community is based on a knowledge tradition.

In this project collective thinking has been given expression in collective social learning – one of the key tools used to embrace different realities derived from different knowledge bases in the western knowledge tradition. The hypothesis or proposition is that all 6 knowledge cultures (see companion paper on collective social learning for more detail) in the western tradition need to be brought together in order for transformation to occur.

Separate paradigms or something emergent?

Adaptive thinking, resilience thinking and collective thinking are closely related and can be traced back to common roots. A number of linkages and overlaps have been identified even in the very superficial exploration of the three ways of thinking expressed above. The resilience alliance has postulated the importance of social network management and all three concepts are closely linked to systems thinking. The connection between adaptive governance attributes and system resilience has been established, adaptive management and adaptive governance are claimed to be necessary inputs to effectiveness, social learning and adaptive management are both learning based and so on.

In the light of some confusion over terms it may be useful to equate transaction with adaptation and use the latter primarily in this project.

The aim of the project is to bring these modes of thinking to bear on agreed wicked NRM problems within a collective social learning (synthesis) framework in the pursuit of a transition to sustainable resource use in local-regional social-ecological systems. What will emerge from this intervention and whether at some point the three concepts will become integrated and morph into something emergent during attempted synthesis we don't know yet?

The challenge of applying this thinking to wicked NRM problems

This study has multiple objectives. We are attempting at the same time to:

- Develop a toolkit and set of partner narratives that will assist wider NRM managers and policy makers in meeting the challenge of significant change
- Work in collaboration with partners to intentionally manage a transition to sustainable resource use embedded within a participative action research framework
- Leave our partners better equipped to manage significant change and with working processes and systems to apply to these and other wicked problems
- Stand outside that process and critique both our own interventions and the theory behind these modes of thinking we have introduced as inputs to the change process.

It is considered important to introduce the three modes of thinking: resilience, adaptive and collective through the conceptual frameworks in which they have been developed. In this way we can reflect on the success of these four journeys reflected in the objectives in three different collaborations and contexts from a known baseline and better document the factors that enable and those that inhibit transformation in the partner regions.

A framework for baseline resilience assessment and readiness for change

The Resilience Alliance has released two Workbooks for assessing resilience in social-ecological systems. As a member of our research team, Dr Walker is an author of the approach and the workbooks lend themselves to a workshop style assessment it is proposed to use such a workshop as an initial contact point with communities in the partner collaborations.

It is envisaged at this stage that the two day workshop would start as a baseline assessment of the social-ecological system and over two days also serve as introduction to and grounding in resilience thinking.

The *workbook for scientists* topics includes more detail than the *workbook for practitioners*' including an assessment of governance and different knowledge perspectives. This provides an opportunity to either introduce adaptive governance in this workshop thus avoiding repetition and over burdening the partners and community with workshops or to build on the concept. However a trade-off needs to be made on whether communities and practitioners can cope with the extra detail.

Figure 1: Resilience thinking and adaptive governance workshop

DEFINING AND UNDERSTANDING THE SYSTEM

- Resilience **of** what?
- Resilience **to** what*?*
    - Identifying system drivers and disturbances
    - Developing a historical profile of the system
- People and governance
    - Key players
    - Governance

ASSESSING RESILIENCE

- Developing conceptual models of change
    - The prevailing mental models for ecological and social-ecological dynamics.
    - Phases in system dynamics, critical scales and cross-scale connections
    - A state-and-transition picture.
- Alternate System regimes, controlling variables, thresholds and tipping points.
    - A Conceptual model of regime shifts
    - Likely pathways into the future (scenarios)
    - Possible alternate regimes and thresholds
- Likely interactions among thresholds
- Cross-examination of the conceptual model(s) with known resilience and adaptability attributes
    - Resilience Attributes
    - Adaptability Attributes
    - Changes in "capitals"
- Cycles of change and cross-scale interactions

IMPLICATIONS FOR MANAGEMENT INTERVENTIONS

SYNTHESIS OF RESILIENCE UNDERSTANDING

KINDS AND SCALES OF INTERVENTIONS

- Critical thresholds and interventions

INTERVENTIONS IN RELATION TO PANARCHY BEHAVIOUR

INTERACTIONS AND SEQUENCING

ADAPTIVE MANAGEMENT

IS TRANSFORMATION CALLED FOR?

Irrespective of which workbook forms the basis of the resilience workshops – one in each of the partner regions the outputs will include conceptual mapping and rich picturing of the social-ecological systems under study and of the larger systems in which they are situated including a cross-scale assessment. These assessments will form a useful baseline from which to evaluate change over the course of the project and beyond if the partners choose to keep the monitoring process active after the project concludes.

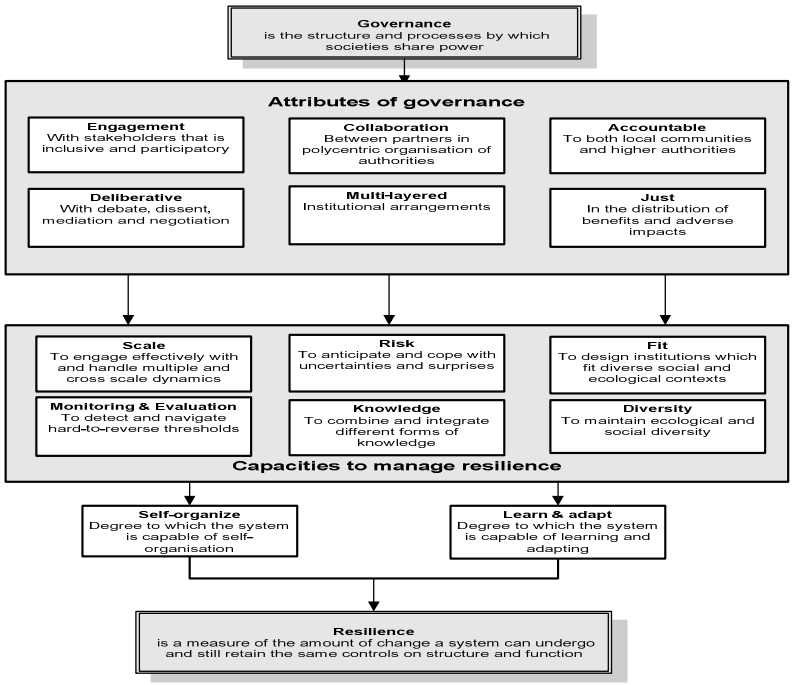
A potential framework for baseline adaptive governance assessment

While the Resilience Alliance generates and coordinates scholarly work on adaptive governance and adaptive management the research community around adaptive governance is more diverse. A generalised framework is not available yet and there are numerous centres of development. It is therefore more difficult for us to focus on a single framework that will serve as the assessment tool for this project.

Dr Measham, Professor Curtis and Dr Griffith have worked extensively on emerging notions of adaptive thinking and adaptive governance. The intention is to evaluate the applicability of three different frameworks currently under development. These are:

- Lebel's governance and resilience framework - which has links to the development of the NSW Standard for Quality NRM – an early expression of adaptive thinking (see Figure 2)
- Principles for good governance developed by UTAS and CSU and now being modified for adaptive governance – which also links to work by Bellamy and others
- Olsson's framework for readiness for transformation – which also has links to work at UNE on windows of opportunity and leadership

Figure 2: the NSW Standard for Quality NRM in Lebel' Governance – Resilience Framework



Initial review and working experience would suggest that these are all partial frameworks. An early task of the Transformation project will be to either merge these into a more complete framework or fully develop one of these frameworks to suit the assessment requirements.

Depending on whether adaptive thinking and resilience thinking can be successfully covered in one workshop the baseline assessment will need to include both qualitative interviews and extensive document analysis to add to the workshop 'pictures' of governance.

A framework for collective social learning

The project will use Professor Brown's Collective Social Learning Spiral in a workshop setting as both an introduction to collective thinking and as a synthesis tool. Her process is described in a separate scoping paper.

Next steps

This scoping paper only scratches the surface of these complex concepts and tools.

- Much more literature review is necessary to draw a line under what we already know from previous work and what might emerge out of the project. This work will be a priority in the early stages of the project.
- The resilience workshop and collective social learning workshops will need to be piloted – probably with the ACT community – although both Dr Walker and Professor Brown are widely experienced in the use of these tools
- The adaptive governance framework will need more work before it is ready for application and any baseline assessment tool will need to be trialled.
- A glossary of terms would be useful. There is a temptation to compile it here but in the spirit of participative action research it should be developed with the partners starting with common usage not academic speak.

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Scoping paper 3
Collective thinking and social learning: pathways for transformational change

Valerie A. Brown
The Transformation Project

Synopsis:

Our society has long recognised the need to establish local and global connectivities in support of a sustainable future for natural resource management. Making strong connections among the parties the basis for policies, strategies and action requires a significant change in the way we approach these processes in the first place. The Transformation Project introduces collective thinking as an essential partner to resilience thinking and adaptive governance as drivers of transformational change. The aim of the Project is to combine these diverse ideas in generating a creative synergy capable of resolving the wicked problems inherent in social-ecological change.

Key individuals, the affected community, relevant specialisations, and influential organisations make essential contributions to decisions on sustainable natural resource management. Yet they are more often treated as having conflicts of interest than as members of a valuable alliance. In the Transformation Project the capacity to combine these interests in collective thinking and collective social learning practices is explored through collaborative action research.

Background: collective thinking and wicked problems

For the complex challenges involved in moving towards a more sustainable future, decisions tend to be made in one of three ways: consensus, a majority, or an accepted authority. Yet decisions made in any of these ways are rarely widely observed nor lasting, whether it is the general support for biodiversity, the parliamentary vote on carbon trading, or the regulations which predetermine land-use. Compare these apparently binding decisions with cases where there is a groundswell of support which brings long-term change. Some examples are the global response to the 2007 Pacific tsunami, the checking of the potential pandemic of SARS, the fall of the Berlin Wall, or the standardisation of seat-belts and breath-testing.

These events may appear in hindsight to have come out of the blue, or else to have been predictable. The outcomes may appear a knee-jerk responses to a crisis or as part of an inevitable trend. Yet a deeper understanding reveals that they are neither. They are synergies made possible by the concerted support of the full set of interests: the key individuals, the affected communities, the available expertise, and influential organisations. The glue is the shared clarity of purpose which links them all. That is not consensus but a sense of a common purpose among a set of diverse interests.

Collective thinking therefore reverses the current mode of dividing complex issues into separate parts, and then having special interests dealing with those parts. It sets

up a collaborative team which fieldwork in whole-of-community change has identified principles of collective thinking (Brown 2008 pp171-183):

7. Respect for other's ways of knowing: their sources of evidence and tests of truth.
8. Reflection on and critical consideration of one's own thinking;
9. Learning to hear community voices and recognise their key icons and symbols;
10. Translation of specialised research into commonsense questions;
11. Transparency of the values and interests of influential organisations (including one's own); and
12. Shared clarity of purpose (not necessarily consensus)

The Transformation Project offers maximum opportunity to explore ways of developing a synergy from diverse interests. A research team from environmental and social sciences, management, and community development has recruited practitioner partners from each of three regions. Each region falls within a different jurisdiction, and across local and regional scales of action, affecting a total population of a million people. Lasting decisions on regional change require collaboration among key individuals, the affected communities, the relevant specialisations, and influential organisations. The Project brings into play three powerful drivers of change: resilience, adaptive and collective thinking. The shared commitment for all of these interests is to enhance he capacity to move towards sustainable management of social and environmental resources.

The collective thinking required to address the collaboration required for the Project rests on a paradox. The components of effective action are the same strongly divided interests charged with leading to the problem in the first place. Ways of making collective decisions among the full range of potential players are needed to resolve this paradox. Otherwise their competing interests only serve to perpetuate the problem.

Collective decision-making therefore challenges the well-established assumptions that science, politics and art do not mix, and that science is the only reliable form of knowledge. A synthesis processes is required to bring those ways of knowing together to make collective decisions and to take collective action. Unless such a synthesis becomes a practicable option, and collective social learning takes place at both local and global scales, there is little hope of a coordinated system of governance capable of supporting regional sustainability. This study seeks to

It is important not to underestimate the magnitude of the required change. It is far from business as usual, but a different approach to present ways of decision-making and the construction of knowledge. Rittel and his colleagues have labelled the type of problem whose resolution requires changes in the society that generated it a "wicked problem".

Horst Rittel 1973 gives the characteristics of a wicked problem as:

- **No final solution:** since a wicked problem is part of the social fabric in which it sits, any resolution of the problem leads to social change, and so generates fresh problems that need new solutions, in a continuing learning spiral.
- **Every problem unique**: any complex social-environmental problem can only be understood as the product of a society at a given time and place, in the context of *what is*.
- **Existing solutions can impede change**: concentration on what works now restricts the capacity to creatively explore *what could be*
- **Confusion between facts and values:** in complex issues requiring social change, the distinction between fact (*what is*) and value (*what should be*) becomes blurred and the debate becomes confused.
- **Solutions from unexpected sources:** paradoxes are signals of points where a society has become unstable, and so offer fruitful areas for social learning and change.

Each of these conditions can readily be identified as applying to natural resource management issues, from maintaining biodiversity to pursuing sustainable agriculture. The uncertainty and variability of the changes to the biophysical parameters requires resilience thinking in the management response (Walker and Salt 2006). The diversity and fluctuations of the power relationships generate calls for adaptive governance involving all concerned (Griffiths 2008). The resolution of paradox and clarification of facts and values among diverse decision-makers in resilience thinking and adaptive governance requires collective thinking (Brown 2008). Understanding the potential of the synergy from combining all three in resolving wicked problems is the objective of the research.

Achieving collected thinking in a divided world

A six year action research program on enhancing local capacity for change towards sustainability found that every program of lasting change involved the collaboration among some key individuals, the affected community, the relevant specialists, influential organisations and integrative thinkers (Brown 2008).

But the study also found that each of these interests use different languages to describe the same issue, choose different avenues of action, work to different timetables and are directed towards different outcomes (Figure 2 below). Such patterns of difference were not primarily matters of right and wrong. They were different interpretations of the same reality, each internally consistent and valid within their own terms. Each produced a version of reality validated against criteria, thus isolating each version in a different knowledge culture.

Take natural resource management in any one area. For the individuals involved, it is their livelihood and their everyday experience. For a community, it is a set of shared practices, some of which may be controversial, but a familiar story to all. For the specialist advisors, it may be a matter of the biophysical condition, the quality of life, the contribution to climate change, or the loss of biodiversity, each understanding contributed separately. For organisations, it will be achieving their own agenda, whether it is government policy, industry profits, or a social service organisation's search for equity. For arriving at the shared holistic understanding, creative thinkers

are needed. For sound and lasting decisions, all those contributions are equally important, and all need to think collectively within a collaborative system. .

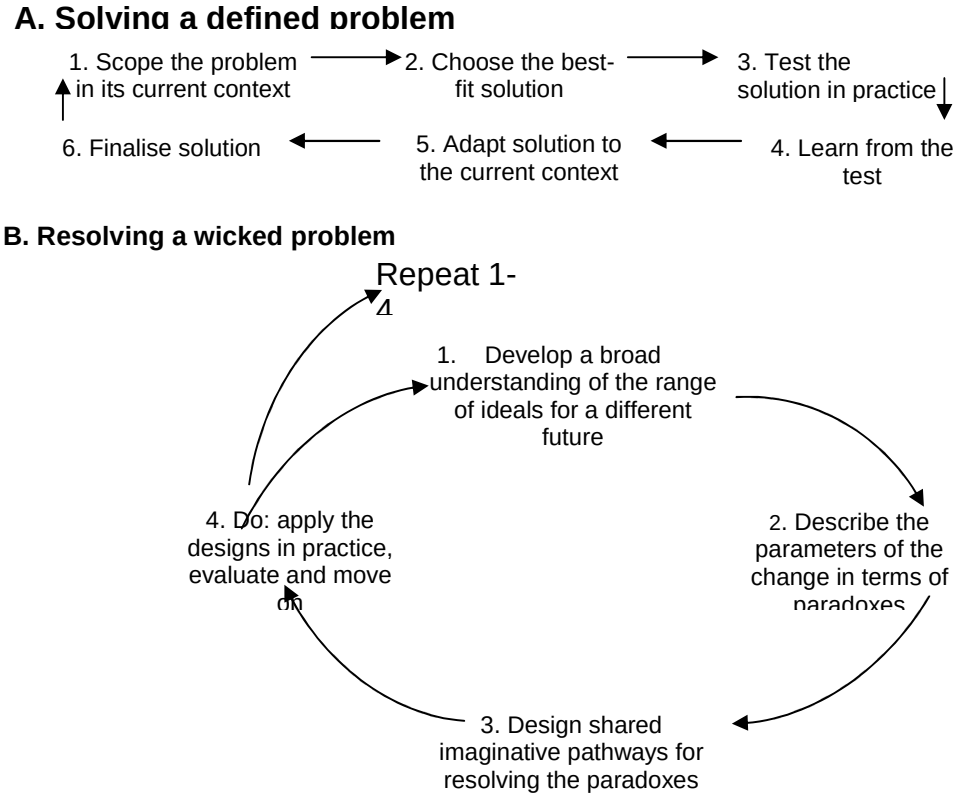
In routine practice, the relationships among the knowledges were more often perceived as conflicts of interest than the potential for collaboration. Each knowledge culture rejected the others by criticisms such as biased (the reflections of individual knowledge); anecdotal (the stories of community knowledge); jargon (the specialised terms of expert knowledge); deals (the strategic decisions of organisations); and airy-fairy (the holistic insight into the issue at hand). While each criticism has some weight, it is hardly enough to dismiss the whole of each system of knowledge when validated against its own relevant criteria.

A mandala of collective thinking

Accepting that collective thinking is required for coordinated and lasting decisions, the impetus to achieve collective thinking has been found to be a crisis, a committed advocate from the community or any level of an organisation, and/or a well-designed intervention. Criteria for such an intervention are slowly emerging from successful examples of collective practice.

Resolution of wicked problems asks for a flow of inductive reasoning (Figure 1.) In Figure 1, there is a sharp contrast between the A and B styles of approaching problems. A is a closed and B an open system. For sustainability issues, it is clear that inductive reasoning is needed at each stage of the problem-solving.

Figure 1. Two forms of problem-solving



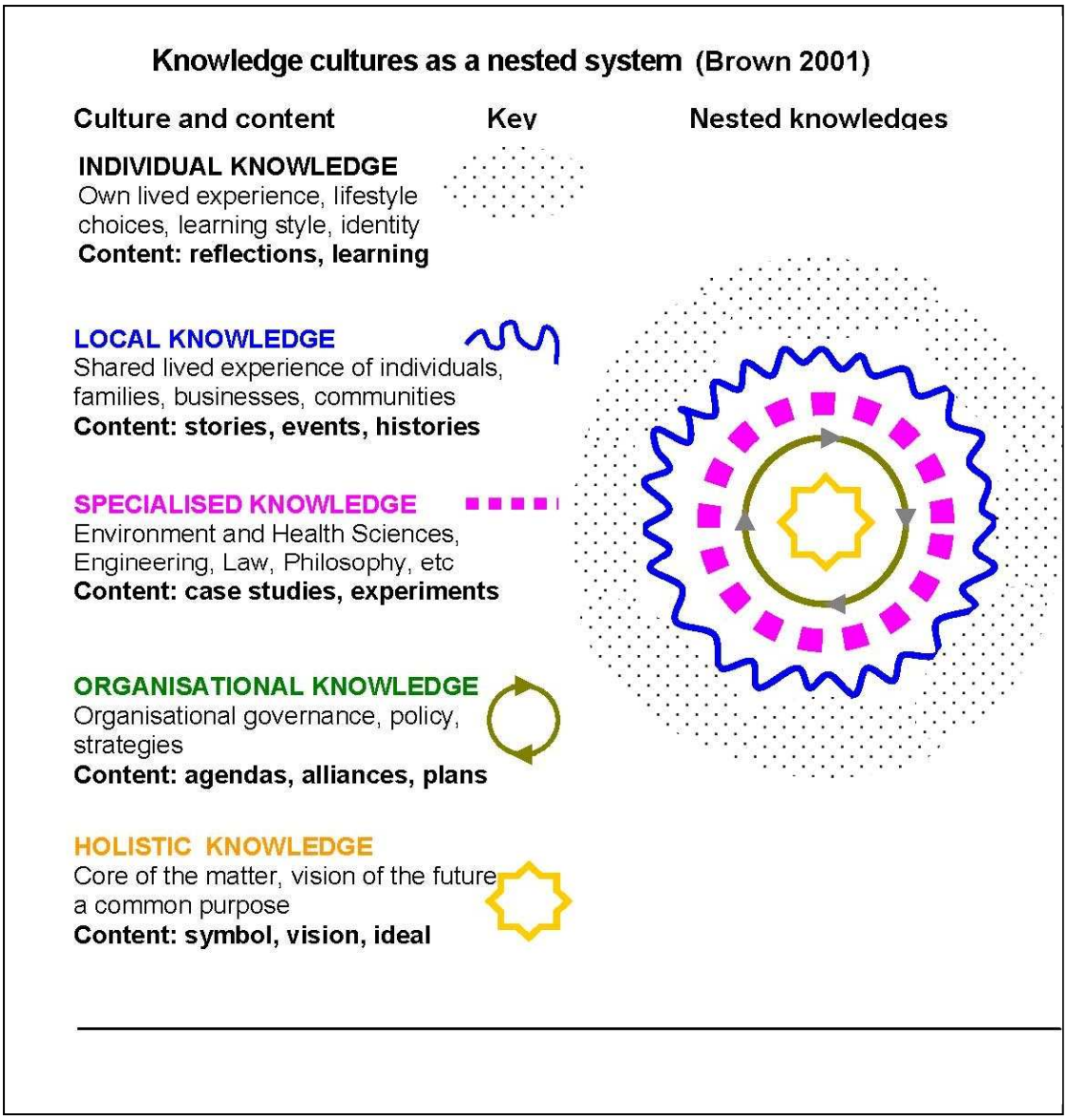
Two challenges arise in collectively following an inductive pathway. One is the need to select the key contributing factors from the confusing maze of influences on decision-making. The other is the task of validating the resultant synthesis. In this case, the factors being proposed are the essential contributors to any lasting decision. So the challenge becomes how to bring key individuals, affected communities, relevant specialists and influential organisations into a single decision-making system.

The first step in the transformational change of moving from compartmentalised to collective thinking is to focus on the connections and not the divisions. This is harder than it seems, since it is contrary to current practice. The more familiar decision-making hierarchy is headed by a competition for primacy between expert knowledge and strategic political knowledge. Community and individual knowledges are treated as second best, and holistic knowledge seldom acknowledged. In collective thinking, all knowledges are respected equally, requiring a significant shift in thinking. .

In Figure 2 the decision-makers' knowledge cultures are presented as interconnected through each knowledge building on the one before. All knowledge begins in the individual's head, and contributes to the knowledge base of their various communities. In the case of the Transformation Project, the communities are those that cross the scales on each of the three sites. The research team and partners form another community.

Specialised knowledge draws evidence from the contributing communities, each from a particular perspective. In making the strategic decisions of organisations, these findings are ideally drawn together in an informed decision. Finally, some holistic, or core, understanding must weave through the connected system, so that the contributions are shared by the contributors. While these relationships are represented in Figure 2 as a mandala, the actual practice is much more complex, open ended and uncertain, as befits a wicked problem.

While Figure 2 lists the types of knowledge of the decision-makers who contribute to sustainable practice, it also lists the modes of inquiry that lead to those knowledges. Thus collective thinking is not only about the outcome from combining knowledges, it is also about involvement in collective learning.



The practice. The collective social learning spiral

If it is to resolve social-ecological issues, collective thinking requires a mode of exploring any given synthesis so that it leads to action. The spiral of *collective social learning* developed with over 200 groups in the field of local sustainability is built on Kolb's 1984 experiential learning cycle (Brown 2008). The aim in each action research enterprise is to identify the mutual learning and its follow-up of collaborative action. Kolb's original learning cycle was the outcome of extensive research in the 1970s and 80s that confirmed that individual learning was only established for the long term after going through four stages: Clarifying existing ideals: *what should be?*; then documenting the parameters of the projects, the facts: *what is?*; accessing new ideas: *what could be?*; and testing the ideas in action: *what can be, in practice*? The same cycle can be used collectively, by including the diverse knowledge cultures at each learning stage. The holistic focus question guides the direction of the collaborative action research.

For regional natural resource management, *what should be* is moving towards the ideal outcome for all the players: individual goals, sustainable communities, conservation and farming, urban and rural, this generation and the next, economic viability for industry and policy goals for government. *What is* identifies a range of factors which support and inhibit progress towards the ideals, particularly in their capacity to positively resolve paradox. *What could be* is whole-of-community collaboration towards social and ecological sustainability. *What can be* is the extent to which individuals, communities, experts, and organisations can form effective teams to put the ideas into practice, given the constraints and benefits of *what is* (Figure 3).

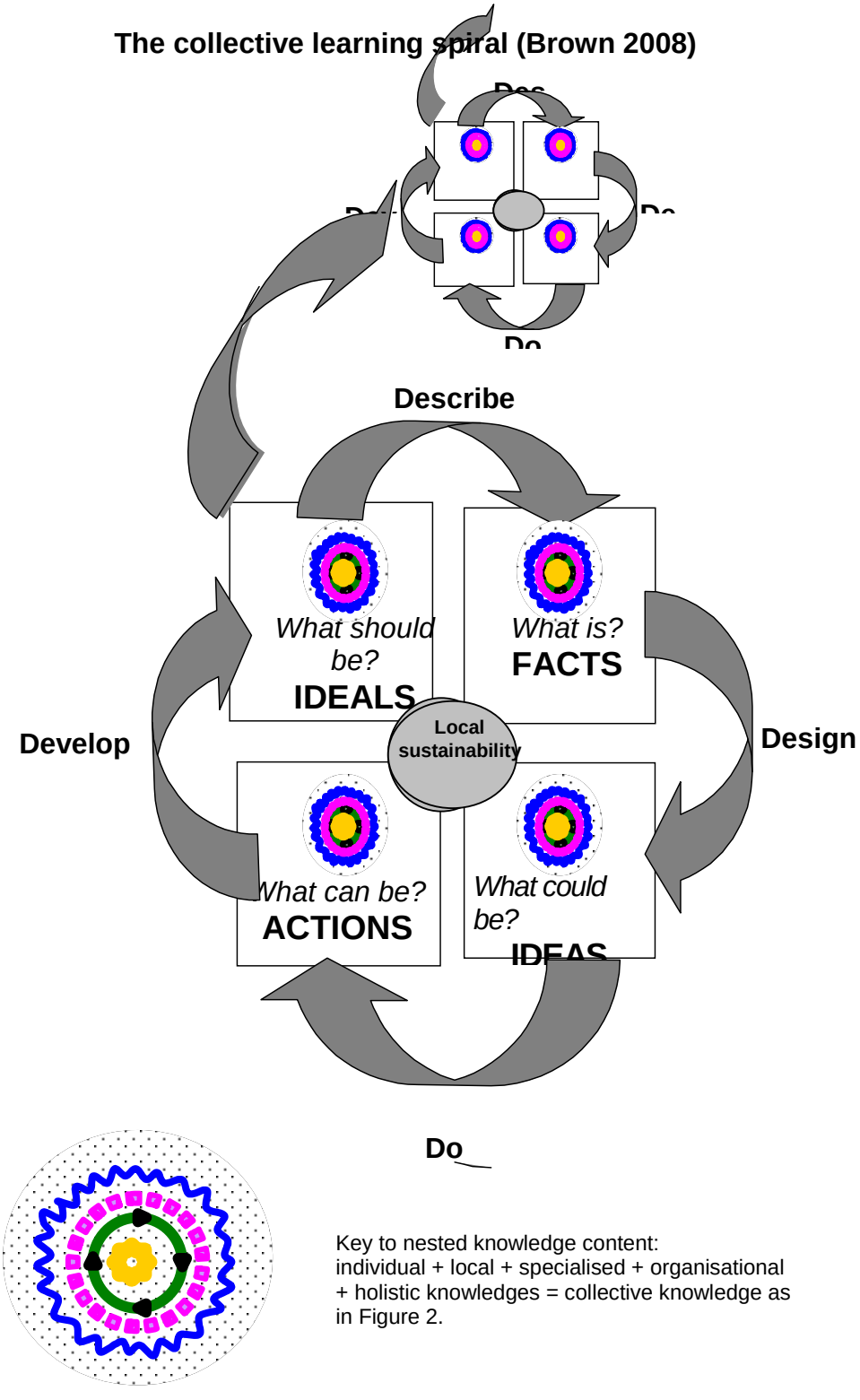
In the collective social learning spiral, the knowledge cultures of Western decision-making (the individual, community, specialised, organisational and holistic constructions of knowledge discussed above) inform each other at each stage of the Kolb's learning cycle. The new knowledge so gained is emergent and cumulative as proponents from each of the knowledge cultures s answer the following questions in turn:

Q. *What should be?*	A. The range of ideals from each knowledge culture;
Q. *What is?*	A. Sets of facts from each knowledge culture;
Q. *What could be?*	A. Creative ideas for collective change;
Q. *What can be?*	A. Innovative program for collaborative action

Examples of the outcomes from collaborative action research applying the collective social learning spiral are attached (Appendix 1).

In The Transformation Project the focus research question can be summarised as: Can a combination of resilient, adaptive and collective thinking be effective in achieving transformation towards a potentially sustainable future, in the case of the wicked problem of working across scales, jurisdictions, professions, and organisations?

Figure 3.


The collective learning spiral (Brown 2008)
Describe
What should be?
IDEALS
What is?
FACTS
Develop
Local sustainability
Design
What can be?
ACTIONS
What could be?
IDEAS
Do
Key to nested knowledge content:
individual + local + specialised + organisational + holistic knowledges = collective knowledge as in Figure 2.

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Attachment 1.

Examples of collaborative action research into complex sustainable resource management issues

Case study 1. Sustainable regional resource management
In the case of a region of exhausted agricultural and natural resources, the focus question was: *How can this region change to support sustainable agriculture?* Those who came together to answer the question were drawn from 10 rural industries, five sub-regions, government agencies, regional opinion leaders, and the coordinating Catchment Committee who funded the study.

What should be?

Seven characteristics of a good life in the region: managing change, having accountability systems, using market mechanisms, working with whole supply chain, establishing collaborations, finding life-work balance, achieving on-ground sustainability, and making the system work for you.

What is?

Each contributing group described a different reality, bringing a deeper understanding of the region's strengths and weaknesses.

What could be?

Change strategies that could satisfy the seven characteristics of a good life in the region:

What can be?

Each industry and region described strategies from their field of interest, providing a powerful overall program of behaviour change.

Case study 2. National rural research program
For future-oriented rural research, the question was: *How can we develop a future rural research policy based on the findings of our past research programs?* This brought together research interests from city and country, government and industry, a wide range of specialists and farmers and graziers.

What should be?

Answered almost unanimously as "through greater collaboration among all the members of the policy community".

What is?

This question produced dramatic anecdotes of lack of collaboration and only a few positive examples.

What could be?

The group developed a comprehensive agenda o unrealised opportunities for collaboration.

What can be?

A policy proposal was put to government to fund an action research program promoting collaboration right across the rural research sector. response pending.

7 Attachment C

7.1 Project in progress fact sheet

PROJECT IN PROGRESS FACTSHEET

Transformation for Resilient Landscapes & Communities

Commencement Date: Dec 2008 **Completion Date:** early 2012

Background

This is a synthesis project. It draws heavily on findings from previous and continuing Land & Water Australia research programs and projects including:

- Exploring attributes and standards for business process improvement in quality assured regional NRM [CSU]
- Pathways to good practice for regional NRM governance [UTAS & CSU]
- Resilience: Enhancing local government capacity in Natural Resource Management
- Change and Continuity in Peri-urban Australia
- Making Successful Investments in NRM Practice Change

Project Rationale

At a local/regional scale in Australia significant investment is being directed to natural resource management and sustainable resource use through devolved or multi-layered governance arrangements. Two broad areas have been identified as requiring further study.

1. At local/regional and global scales climate change has refocused attention on long-standing assumptions that transactional change (adaptation within current social-ecological systems) can enable a transition to sustainability and sustainable resource use. This approach is deeply entrenched in current resource management programs. A contrary view – moving towards transformative changes in our linked social-ecological systems before it is forced upon us - is increasingly seen as a valid policy option.

2. The relationship between regional NRM bodies and local government is recognized as an important but unresolved issue in recent evaluations of national NRM programs. Some clarity around opportunities and options for collaboration in this area will assist the implementation of existing NRM arrangements and contribute to the ongoing development of NRM policy.

Three deeply insightful ideas namely, resilience, adaptive governance and collective social learning are now being used separately, and increasingly together, as new frameworks for managing the transition to sustainable resource use.

This grounded and client focused study of change in local/regional social-ecological systems would use a case study approach where researchers work with partners on real world issues to explore the potential to use cutting-edge social-ecological theory

to develop a process that will enable transformative change to occur. The findings will be critical to the wider debate on the investment focus and governance of future NRM programs. Such a study will also add to a relatively new body of knowledge on resilience thinking, adaptive governance and social learning applications in NRM and develop insights into the intentional management of transitions to sustainability.

At the interface between local and regional scales, participating regional/local partner organisations will learn by doing to further build the social and human capital that is required for transformational change.

Research Questions

The Institute for Land Water & Society at Charles Sturt University, the Fenner School of Environment & Society at ANU and CSIRO Sustainable Ecosystems are undertaking a participative action research project that asks:

1. **Can NRM organisations partner with local governments to manage intentional transitions to sustainable resource use in their linked social-ecological systems?**
    a. How effective are resilience thinking, adaptive thinking and collective social learning separately and together, as ideas/principles to guide those seeking to establish processes that will enable transitions to sustainable resource use?
    b. What parts are played by the range of decision-makers involved in the adaptation/ transformation tension – how are choices made between adaptation and transformation and do all have to be present to enable transformation?
    c. What are the key factors and events that support/enable or limit/ constrain transformation in social-ecological systems at the regional/local scale?

2. **What are the implications of this research for NRM governance in Australia?**
    a. What are the factors that enable and inhibit effective collaboration between regional NRM bodies, local governments and their communities on agreed wicked NRM problems?
    b. Does the relationship between local government and regional NRM bodies in Australia require radical change to enable the transition to sustainability?

Target Audience/s for Project Findings

The work will be applicable to all NRM managers, practitioners and organisations facing the challenge of how to cope with change by providing a process for managing cross-scale transformational change that can be rolled out to NRM organisations Australia wide. The work is also expected to provide useful input to the development of national NRM policy and to the development of NRM targets and investment strategies at all scales. The work will be of particular value to our seven regional and local government partners and their communities and will have wider application in all NRM regions.

Research design:

A three-year collaborative action research study is proposed involving three coupled local government/regional NRM bodies in different institutional and landscape settings, each committed to a sustainability transition (Figure 1). The research team will dedicate one team member to work closely with a champion of transformational change from each study region to assess and build readiness for change, manage the transition and consolidate adaptive governance among the partners.

Resilience thinking and adaptive thinking will be introduced into each of the partner collaborations via a workshop based on the Resilience Workbook. This approach delivers rich picturing of the social-ecological system structure, function and thresholds, the ability to assess resilience of the systems and to make choices between adaptation (within the system) or transformation (to a new system of landuse) through assessment of alternative futures At the same time a baseline of readiness for change will be developed using this workshop and supplemented by interviews and document analysis to provide an empirical basis for tracking change.

Browns collective social learning workshop will be used as a synthesis tool to bring the new thinking to bear on the wicked NRM problems identified by each collaboration project to create a window of opportunity for transformation to resilient landscapes and communities. Subsequent workshops will track progress and assess the factors affecting the transition.

Project logic

It is expected that over the course of the project partner organisations will have developed:

- Improved understanding of the three key concepts and their interconnections in practice;
- Enhanced capacity to make judgements about the potential for transformational change in pursuit of progress towards sustainable resource use systems;
- Skills and knowledge to implement processes that lead to transformational change towards sustainable resource use systems.

This includes (see Figure 2) an enhanced capacity to:

- Assess the resilience of current and alternative future social-ecological systems and the sustainability of their land use
- Assess and develop readiness for change
- Recognise, create and open windows of opportunity for change
- Manage adaptation and transformation processes,
- Build and maintain strategic collaborations around ‘wicked NRM problems’*
- Run and maintain continuing social learning systems
- Operate within an adaptive governance framework

Wider outcomes will include access by all NRM practitioners to a tested toolkit and a portfolio of demonstration stories from managed partner transitions, as well as adding to the knowledge base around transitions (adaptation & transformation), resilience, adaptive governance and collective social learning.

Figure 3 shows the relationship between broad level actions, some outputs or deliverables and high level outcomes consistent with the project design.

The Partners

- Corangamite Catchment management Authority (VIC)
- Surf Coast Shire Council (VIC)
- Burdekin Dry Tropics NRM (North QLD)
- Terrain NRM (North QLD)
- Townsville City Council (North QLD)
- ACT NRM Council (ACT)
- ACT Government (ACT)

Partners are committing both cash and in kind contributions to the study and form a vital part of the research effort in a participative action research model.

The Researchers and Project Forum

The research team is lead by Dr Rod Griffith (Charles Sturt University) and includes Professor Valerie Brown (ANU), Professor Allan Curtis (CSU), Dr Tom Measham (CSIRO) Dr Carmel Pollino (ANU) and Dr Brian Walker (CSIRO & Resilience Alliance).

A project forum will be held in each of the study locations during the study. The Forum includes:

- Land & Water Australia representatives
- Partner representatives
- Community representatives
- Research team
- Expert advisors (as required)

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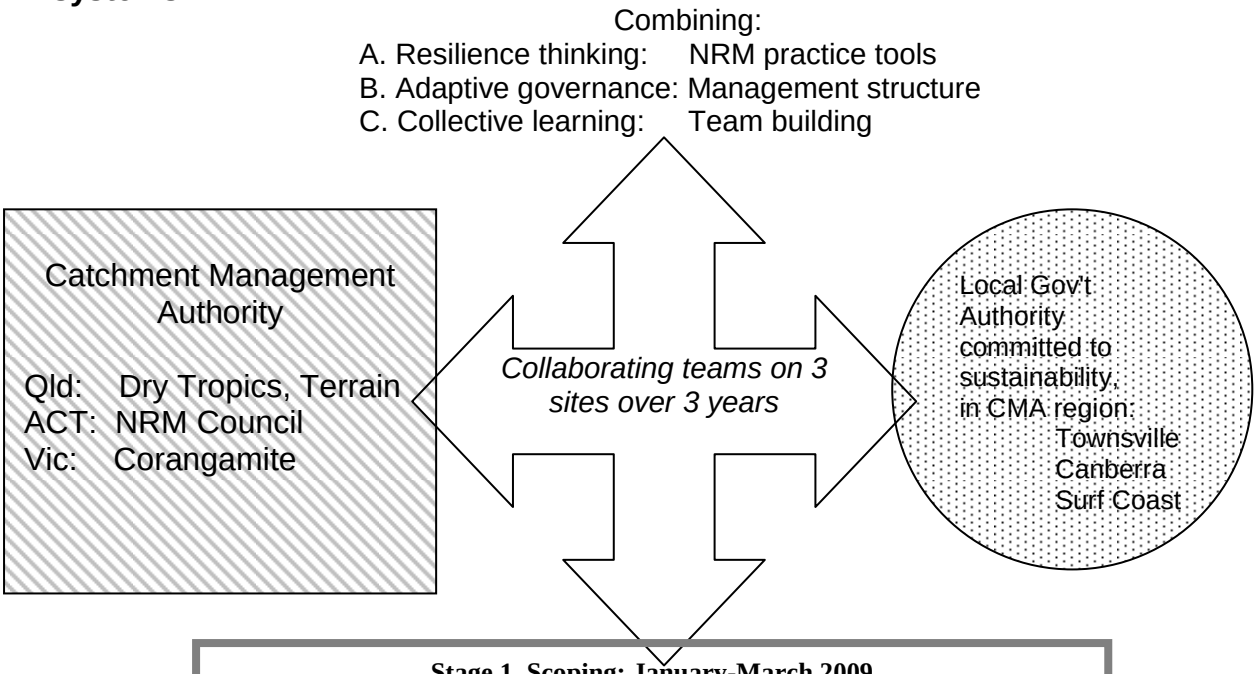
Figure 1. Transformational change in local/regional governance systems



Stage 1. Scoping: January-March 2009

Participants: Regional NRM managers, Council sustainability staff, Research team

Tools:
A. Resilience thinking in NRM project
B. Adaptive governance action plan
C. Collective team-building workshop

Outcomes: Partners commit to project and agree on action plans

Stage 2. Case Studies: March 2009- Sept 2010

Participants: NRM, LGA, farmers, industry, community leaders, and researchers involved in NRM project

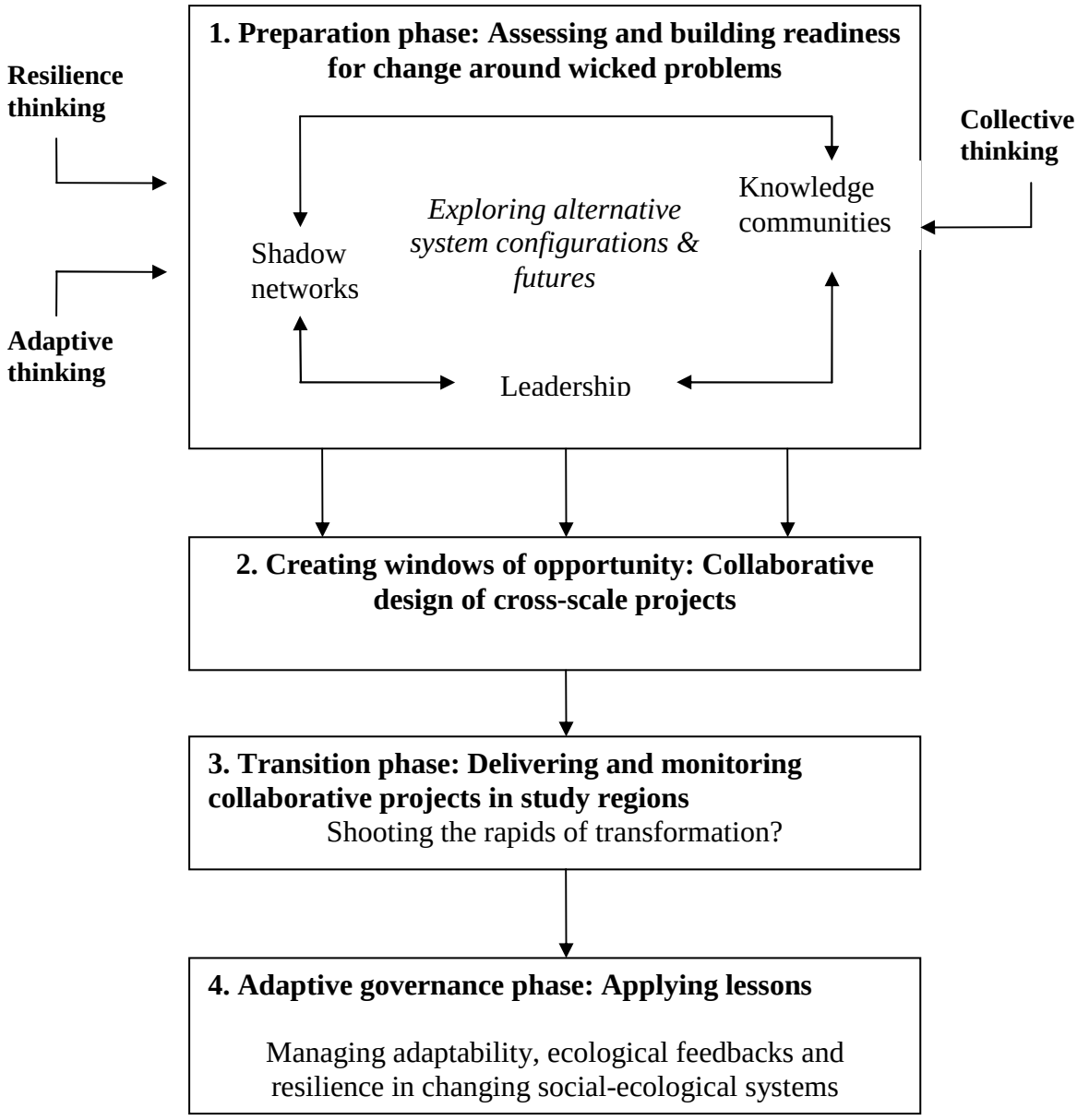
Tools:
A. Resilience thinking/ adaptive governance workshop – system picturing – adaptation or transformation?
B. Baseline of governance systems developed and documented
C. Collective social learning workshops held for all participants to implement change and track progress

Outcomes:
Transformation to adaptive governance and management in partner regions
Transformation to resilient landscapes and communities
A toolkit for wider applicability in NRM

Stage 3. Toolkit trialling and evaluation 2010-2012

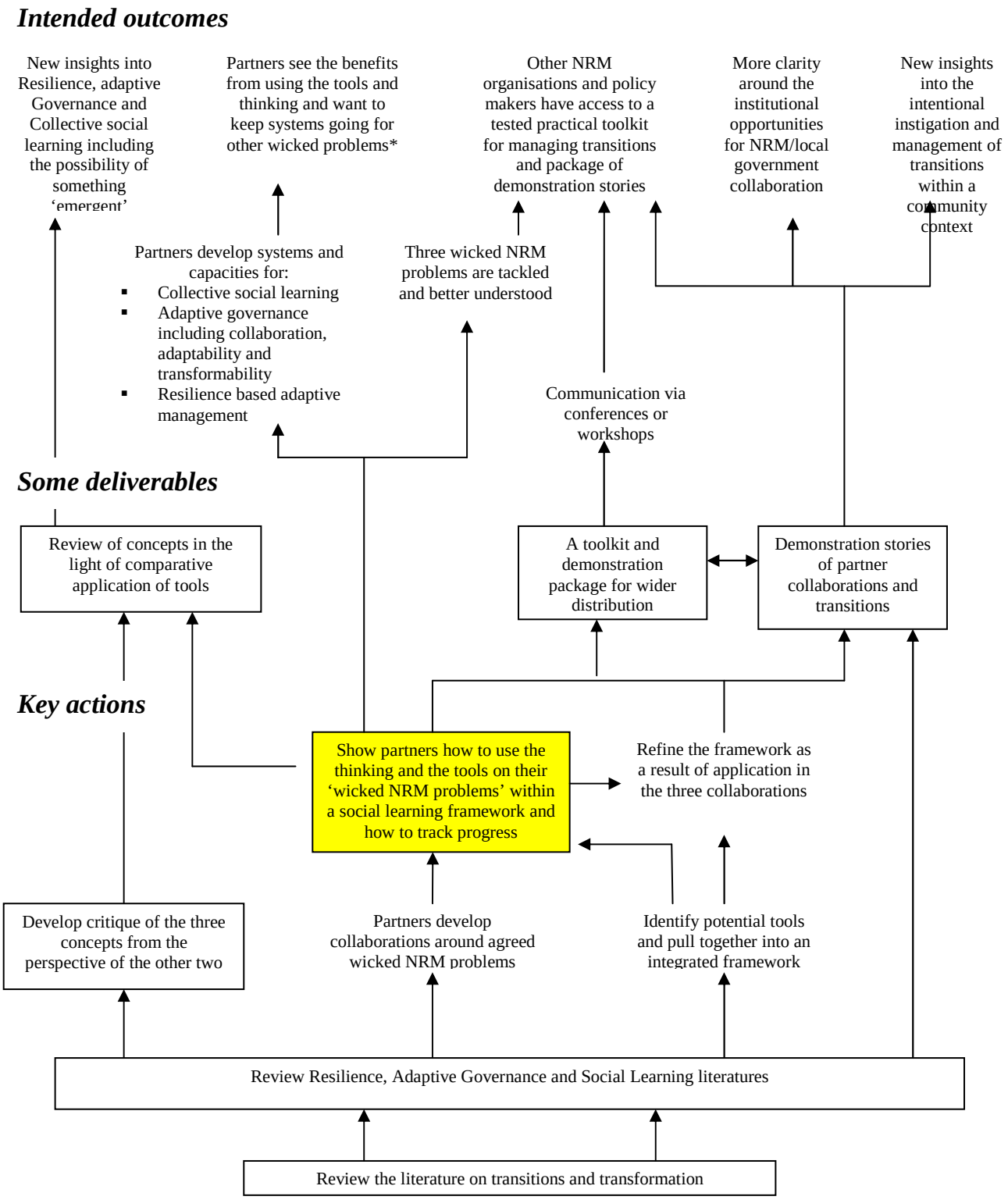
To be developed Toolkit testing in 3 existing and 3 further regional/local government collaborations

Fig 2: Project phases in navigating transitions to resilient, adaptive and collective governance (after Olsson et al 2006)



Note these steps are rolled into the shaded box in Figure 3. Each regional NRM/local government collaboration around their shared and agreed 'wicked NRM problems' will proceed at their own pace according to the degree of readiness for change.

Figure 3: PROJECT LOGIC



* Wicked problems are defined as complex problems whose solution lies outside the system that created them (Rittel 1974)

8 Attachment D

8.1 Presentation of Research rationale to Partners