RESILIENCE

Building health from regional responses to climate change

Project Report

NORTH COAST AREA HEALTH SERVICE
POPULATION HEALTH, PLANNING & PERFORMANCE DIRECTORATE

NSW Health Department

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Authors: Annie Kia, Eric Van Beurden, Denise Hughes, Uta Dietrich

For further information please contact:

Uta Dietrich
Uta.dietrich@ncahs.health.nsw.gov.au

Health Promotion Unit

Population Health, Planning & Performance

North Coast Area Health Service

PO Box 498

Lismore NSW 2480

Phone: 0266 207500

Fax: 0266 222151

SHPN: PHPP 090218

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SUMMARY

The *Resilience* project has enabled innovation which continues to unfold via the *Northern Rivers Climate Change Collaboration,* and within North Coast Health Promotion. The project involved simultaneous generation of *projects* and *conceptual understanding*. On the one hand we were developing practical projects to increase the food resilience and transport options in the region, while simultaneously exploring a conceptual framework that would expedite innovative responses to climate change.

The evaluation of *Resilience* confirms the value, when working in the complex domain, of exploratory probes that do not initially over-specify intermediate objectives and strategies. The graphic representations provided by social network analysis show that there has been a significant growth in network connections in relation to climate change since the development of the *Northern Rivers Climate Change Collaboration* (NR3C), and that the growth of network connections mirrors a growth in outcomes which are:

- A framework agreement for an integrated regional response to climate change [1];
- A functional governance structure which devolves action to working groups;
- The adoption of *Sustain Northern Rivers* (SNR) as the action program of the NR3C, with four priority areas;
- The development of action plans whose scope matches the current NR3C resource base, but which have the capacity to expand if the NR3C is able to attract resourcing;
- Completion of some action plan strategies;
- The hosting the *Michael Shuman Forum* and the *Food Resilience Roundtable*;
- A valuable media partnership, and the adoption of branding *Sustain Northern Rivers*;
- Continuing expansion in terms of membership;
- The emergence of innovative projects; and
- Demonstrated capacity to problem-solve, using methods based on complexity theory.

The evolution of the NR3C provides a case study for the relevance of complexity theory to cooperative social enterprise. It is apparent that the *response diversity* provided by the engagement of such different organisations has been a source of strength, evident in the projects which emerged to address food resilience and transport options in the Northern Rivers. In particular, the *Regional Commuter Mapping* project exemplifies the phenomenon of *emergence* as described in complex adaptive systems theory, having qualities of speed, unexpectedness, and innovation at new scale.

The *Resilience* project necessitated a fuller understanding of the components of *resilience*. This took us into a rich engagement with complexity theory, in which the resilience of complex adaptive systems is understood in terms of response diversity; adaptive capacity; slow moving variables; distance from critical thresholds; tipping points; and network qualities[2-7].

Complexity science is new to Health Promotion. It offers a useful conceptual framework for understanding not only the resilience of natural systems but of social systems and communities, all of which underpin the social determinants of health. Complex adaptive systems theory has implications for the way we plan and operate within organisations and between organisations. It offers practical tools to increase productive collaboration, which is essential if we are to make the fundamental changes necessary to mitigate and adapt to climate change.

Perhaps the most surprising element in *Resilience* came from the use of Action Learning methodology as the vehicle to explore a new conceptual framework. The experience of North Coast Health Promotion is that complexity theory represents a paradigm shift, and that the concepts take time to understand and integrate. The use of Action Learning methodology served well to facilitate a cultural shift among participants to embrace a new explanatory paradigm.

The substantive achievement of *Resilience* has been its supportive role in the evolution of the *Northern Rivers Climate Change Collaboration* (NR3C) and its action program, *Sustain Northern Rivers*. The soft infrastructure created via the NR3C enables innovation. The collaboration has demonstrated a capacity to manage difference, and has developed action plans commensurate with its limited resource base.

The experience of *Resilience* has affirmed the value of Health Promotion engaging with other organisations to respond to climate change, not just because it poses a threat to the social determinant of health, but because it represents a threat of such magnitude that that it requires all organisations to bring their resources and expertise into energetic, purposeful partnership to prevent what Professor Ross Garnaut described as:

> *'…consequences that would haunt humanity until the end of time'.* [8]

Health Promotion, with its expertise in whole-of-population change, has much to bring to the problem-solving table.

INTRODUCTION

In 2008, the NSW Health Environment Branch, in partnership with the NSW Department of Environment, Climate Change and Water, funded North Coast Health Promotion to develop *Resilience: building health from regional responses to climate change.*

The project objectives were:

- To foster collaborative partnerships with other regional organisations and stakeholder representative groups to develop a *Northern Rivers Climate Change Framework Agreement* and supporting processes;
- To use the *Northern Rivers Climate Change Framework Agreement* to enable local community and workplace initiatives to advance climate change mitigation, adaptation and transition strategies;
- To locate and integrate North Coast Health Promotion activities within the broader context of regional responses to climate change in the Northern Rivers and Mid North Coast regions;
- To engage regional and local community stakeholders in designing and implementing four demonstration projects – two at regional and two at local level – that aim to develop collaborative strategies to secure access to healthy affordable food and active mobility.

The original design is shown in the diagram below:

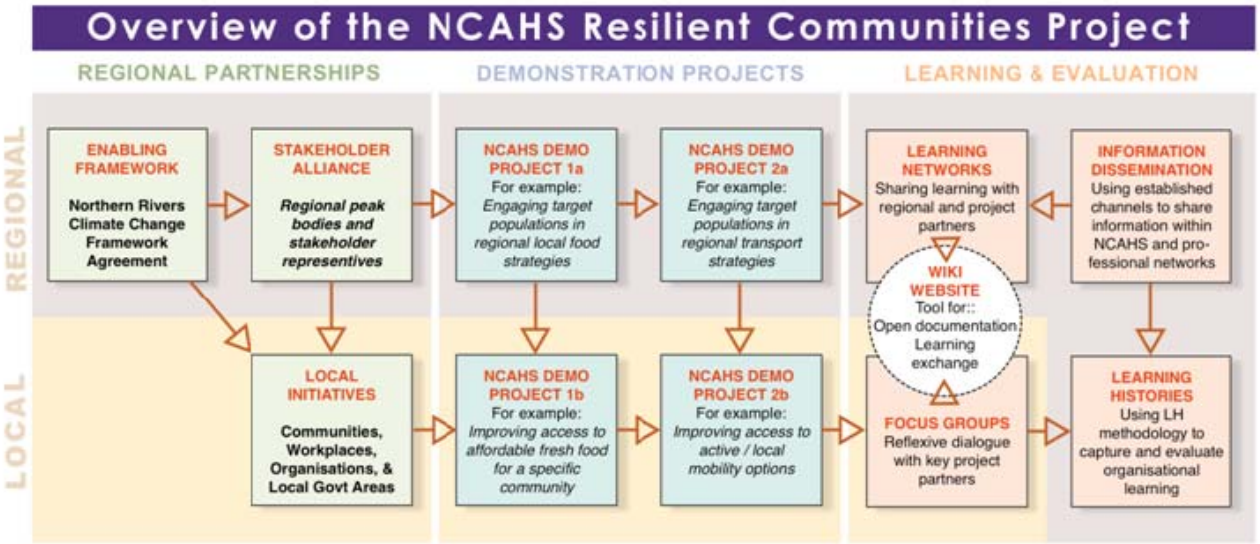


Figure 1: Design of Resilience project

The funding significantly contributed towards a Coordinator position. This additional capacity allowed North Coast Area Health Service to play a significant role in progressing the initiatives described in this report. Illustrating the initiatives does not mean that North Coast Area Health Service is the sole initiator and driver, rather, without the *Northern Rivers Climate Change Collaboration* they would not have happened. The report seeks to contextualise the *Resilience* project in this productive collaboration.

From its inception, *Resilience* had many elements foreign to Health Promotion. There was no precedent for Health Promotion taking an active role in responses to climate change. There were many unknowns in the concept of building a collaboration based on a framework agreement. In addition, North Coast Health Promotion engaged the services of a consultant with expertise in action learning and complex adaptive systems theory for initial project design. This rich cross-disciplinary exchange created the conditions for innovation.

The concept for *Resilience* arose in North Coast Health Promotion as we discussed the urgency to prevent and adapt to climate change. It was apparent that all organisations and sectors must act together to address global warming for the sake of biodiversity; social and economic stability; generational equity; social equity; and food security. Quite apart from the broad social and ethical imperatives to prevent human impacts on the climate system, we were also aware that the broad conditions enumerated above underpin the *social determinants of health*, because human health cannot exist independently from the biodiversity and ecologies that support life [9, 10].

In conceiving the project, we were also conscious that *resilience* is central to the healthy functioning of humans, societies and ecologies, including the meta-ecology of global climate systems. *Resilience* has been defined as:

> *the capacity of a system to absorb disturbance, undergo change and still retain essentially the same function, structure, identity, and feedbacks* [5]

The *Resilience* project was a probe into the acknowledged '*complex zone'* of social response to climate change, characterized by rapid learning and collaboration across knowledge domains. An evaluation strategy was developed which included both qualitative and quantitative methods. Since adaptation and learning underpin any effort to transform our economy, industries, and ways of living, *Resilience* employed an Action Learning methodology called *Emergence Thinking* that included a web-based learning exchange network; reflexive group dialogue; and learning history. This enquiry focussed on the usefulness of complex adaptive systems theory to understand *resilience*, and the conditions that enable it to occur.

The *Resilience* project saw an opportunity in the idea of an integrated regional response to climate change, that by acting together we would be building the social capital that is the tissue, the *soft infrastructure* of a resilient region or community. This report tells the story of the way the project developed, and the outcomes to date.

BUILDING A SOFT INFRASTRUCTURE TO ACCELERATE CHANGE

Developing a *Northern Rivers Framework Agreement* and supporting processes

The first component of the *Resilience* project was to build a *soft infrastructure* in the region to accelerate the transformation of our society to sustainable ways of living and working. This infrastructure would be human and relational. The objective to develop a *Northern Rivers Framework Agreement and supporting processes* has been substantially achieved. The region now has:

- A *Northern Rivers Climate Change Collaboration,* based on a *Framework Agreement* to communicate, cooperate and collaborate in relation to climate change;
- A governance model for the Northern Rivers Climate Change Collaboration (NR3C) that devolves agency to an Action Team and reserves strategic decisions to the Committee;
- Adoption of *Sustain Northern Rivers* (SNR) as the action program of the NR3C, with agreement on four priority areas;
- Graphic branding of *Sustain Northern Rivers* (see examples in Appendix 4);
- The development of SNR action plans that are initially modest in scope, mirroring the current SNR resource base, but which have the capacity to expand if resourced. Three are endorsed (Appendix 3), another in draft form. Strategies are underway;
- A *soft infrastructure* that facilitates the emergence of joint projects of regional significance, and that hosts forums to encourage self-organised action, such as the *Michael Shuman Forum* and the *Food Resilience Roundtable*;
- The shared experience of using effective methods to move through the inevitable conflicts and impasses that arise in human collaboration;

The Collaboration is evolving and new members are now seeking membership. The current participating organisations are Byron Shire Council; Catchment Management Authority; Local Community Services Association; NSW Department of Education and Training; North Coast Area Health Service; North Coast Institute of TAFE; Northern Rivers Social Development Council (in transition to Regional Development Australia); Northern Rivers Tourism; Northern Star Pty Ltd; Southern Cross University; Richmond Valley Council; North East Waste Forum; and Youth Environment Society.

First steps of the collaboration

In pursuing the goal of developing a Framework Agreement and supporting processes, *Resilience* benefited from a close working relationship with Mr Ken McLeod who had been working in a number of capacities to encourage an integrated regional approach to

sustainability. In the context of this partnership, we floated the idea of a regional *framework agreement* for a collaborative approach to climate change in the Northern Rivers at a number of public events which he convened in early 2008.

Following a generally positive response to this concept, we initiated a meeting 10th June 2008 at which the executive officers of the peak regional organisations present agreed to develop an Agreement for an integrated response to climate change in the Northern Rivers. A core group of the organisations who had attended this first meeting then continued working together to develop what later became known as the Northern Rivers Climate Change Collaboration Committee (NR3C). The NR3C Committee has increased its membership, though not without some losses along the way. An emergent new organisation in the region, the Wollumbin Institute, which substantially helped the NR3C develop in the early stages, later withdrew when it was not able to secure a firm resource footing to continue functioning.

The *process* of collaborating: moving on through difficulty

The NR3C evolved rapidly, and like many collaborative processes, went through a period of difficulty as it negotiated decision making in a context of scarce resources. Effective measures to prevent human impacts on climate and ecological systems are contingent on the capacity of humans, in their institutional contexts, to resolve differences and work together.

Because the *process* of collaborating is so central to problem-solving in relation to climate change, some key moments in the development of the NR3C are described in relation to NR3C meeting dates:

10/6/08	Inaugural meeting: decision to develop a framework agreement. A working group develops the draft Framework Agreement;
14/8/09	Adoption of text of *Northern Rivers Climate Change Agreement* (Appendix 1); Media partnership established with Northern Star Pty Ltd; Adoption *Sustain Northern Rivers* as the public brand;
29/9/08	NR3C seeks support of local government and Northern Rivers Organisation of Councils; Decision to map stakeholders and conduct community consultation; Consultation with office of Federal Member for Page re possible sources of funds;
11/11/08	Five new organisations join. Differences of opinion emerge in relation to several issues, including the timing and extent of community engagement, and the role of the Wollumbin Institute. The meeting decides to have a 1-day workshop to help resolve the impasse. North Coast TAFE provides facilitators skilled in methods based on complexity theory;
8/12/08	This well-attended workshop, convened at short notice, produces a *Bluesheet*, a guideline for how NR3C will *'use Sustain Northern Rivers to test our ability to collaborate'.* The NR3C devolves operational efficacy to a *Lean Design*

Team, thereby escaping the paralysis of rule by committee. The appended *Bluesheet* gives a sense of this problem-solving process (Appendix 2);

The *Lean Design Team*, consisting of representatives from NCAHS, SCU, North Coast TAFE, North East Waste Forum, and the Northern Rivers Regional Development Board coheres into a functional group that progresses action. The *Resilience* Coordinator continues to provide a secretariat function;

29/1/09 Differences emerge in relation to community consultation. A key organisation signs the Agreement conditional on a workshop to refine measurable transition goals, rather than to develop these after community engagement;

26/2/09 A governance model is endorsed which devolves action to working groups and reserves strategic decisions to the NR3C Committee. Tensions emerge over the extent and timing of community engagement;

26/3/09 1-day workshop convened to choose and develop priority areas, using methods based on complexity theory. The workshop establishes four SNR priority areas: *Resource Efficiency*; *Food Resilience*; *Transport Options*; and *Enable the Change*. Action plans for each are scoped. The workshop method successfully moves the NR3C through the difficulties;

30/4/09 Draft action plans are tabled for each priority area. Because the NR3C has not secured resources, they are modest in scope, intended to get some runs of the board and to provide the opportunity *'to test our ability to collaborate';*

28/5/09 Endorsement of *Resource Efficiency*, *Food Resilience* and *Enabling* Action Plans (Appendix 3); The *Lean Design Team*, now known as the *Action Team*, continues to work co-operatively together to conduct the operational business of the NR3C. Graphic designs developed for *Sustain Northern Rivers*;

19/6/09 NR3C hosts the *Michael Shuman Forum* on growing a local living economy as we respond to climate change: 53 participants from different industry sectors. Keynote speaker Michael Shuman is noted international economist and writer;

7/7/09 NR3C hosts the Food Resilience Roundtable: 56 participants scope projects to build food resilience in the Northern Rivers;

30/7/09 The meeting of the NR3C is focussed on substantive projects; The Wollumbin Institute, having been unable to secure a resource base to ensure its survival, withdraws from the NR3C.

24/9/09 Meeting discusses plans for a Transgrid line from Tenterfield, and decides to improve capacity for informed comment on energy initiatives by conducting an 'Energy Literacy' day of education in 2010, with keynote speakers.

It is remarkable that the NR3C has reached the current level of coherence based on the in-kind contributions of organisations. Despite this, it has continued to develop, and has conducted two events, the *Michael Shuman Forum* (19/6/09) and the *Food Resilience Roundtable* (7/7/09), both well received by participants. The collaboration has worked to date because organisations make resources available without bureaucratic impediments. For

example, SCU and TAFE have provided venues, video-conferencing and facilitators; the Northern Rivers Regional Development Board funded the NR3C Planning Workshop, and made other events possible by taking on the practicalities of registration; and The Northern Star has provided valuable promotion. North Coast Health Promotion has provided a secretariat function, as well as expertise in Research and Evaluation. There have been numerous examples of organisations making their expertise and resources available.

Mapping the NR3C network using social network analysis

The NR3C is an example of a responsive and effective network of relevant organisations which provides a soft infrastructure. When Social Network Analysis was used to map networks, it became apparent that the NR3C has led to increasing complexity of networks, in terms of quantity and perceived usefulness of the connections.

Social Network analysis was conducted, using UCINET software, to map the development of this regional soft infrastructure resource. To capture the initiation and growth pattern of NR3C's organisational network since it began, respondents were asked to provide data on their network connections for four time periods between July and June for 2005 -2006; 2006 - 2007; 2007 - 2008; and 2008 - 2009.

Network maps at each of these time periods were developed to reflect the onset and degree of communication between participating organisations as a series of superimposed ego nets. To this end, the *Resilience* Project Coordinator compiled a list of organisations that were part of the collaboration at any time since its establishment. This list was then used to construct a single mode, square, organisation-by-organisation matrix.

A key informant from listed organisations was sent relevant columns of the overall matrix and be asked to enter data relating to their organisation's network with other listed organisations. They were also invited to add any relevant organisations that were not listed. The question used to elicit the nature of the key informant's organisational links to each other organisation, at each of the four occasions were as follows:

> *"For each listed organisation please score the QUALITY OF ENGAGEMENT and record the approximate NUMBER OF PEOPLE with whom your staff were engaging about climate change-related issues in each financial year.*
>
> ***Score Quality of Engagement as follows:***
>
> ***0** = no productive engagement; **1** = minimally productive; **2** = somewhat productive; **3**=moderately productive; **4** = highly productive*
>
> ***NUMBER OF PEOPLE** covers all enabling relationships including ones with people you may not contact all the time but can pick up the phone and discuss climate change with if needed. They may be heads of organisations through to project and organisational staff."*

This evaluation was administered via a group email and data was transferred from the circulated Excel spreadsheets into a UCINET data sheet before mapping using Netdraw software. Maps were produced depicting the number of people with whom communication took place, and the quality of engagement scores. These are shown in Figures 2-5.

Results of network analysis

Figures 1 - 4 show the growth of the soft infrastructure enabled by the NR3C. The red dots represent a NR3C member of an organisation that provided data and the blue squares are the organisations that they had relationships with. If a NR3C member who provided data appears in blue, it means that that organisation identified no contact but another NR3C member listed them as a contact. This is not necessary if different perception of contact, the link may be with another person in the organisation. The thickness of the line that joins them in the upper graph for each year indicates the numbers of people with whom they engaged. In the lower graph for each year the thickness of the line indicates the quality of the engagement.

The time frames chosen for this social network analysis precede the inaugural meeting of the NR3C which was 10th June 2008. The year 2005-2006 shows some engagement between the Northern Rivers Social Development Council, North Coast TAFE, and the Regional Development Board. North East Waste Forum was already well connected. NCAHS, Richmond Valley Council, Southern Cross University and Northern Star Pty Ltd are shown as unconnected during that year. The network mapping shows similar patterns for 2006 – 2007.

Following a preparatory phase, the NR3C was initiated in June 2008. The year 2007-2008 shows a jump in the number and quality of connections. For the year 2008-2009 these network connections are much more developed in terms of number and the perceived productiveness of the connections. While climate change may have been coming onto the agenda of organisations and some of these connections may have developed over the time period without an NR3C, it is also true that a number of the organisations involved had no policy imperative requiring them to engage regionally in relation to climate change. It is reasonable to assume that the NR3C has played a significant part in building the networks evident in these graphs.

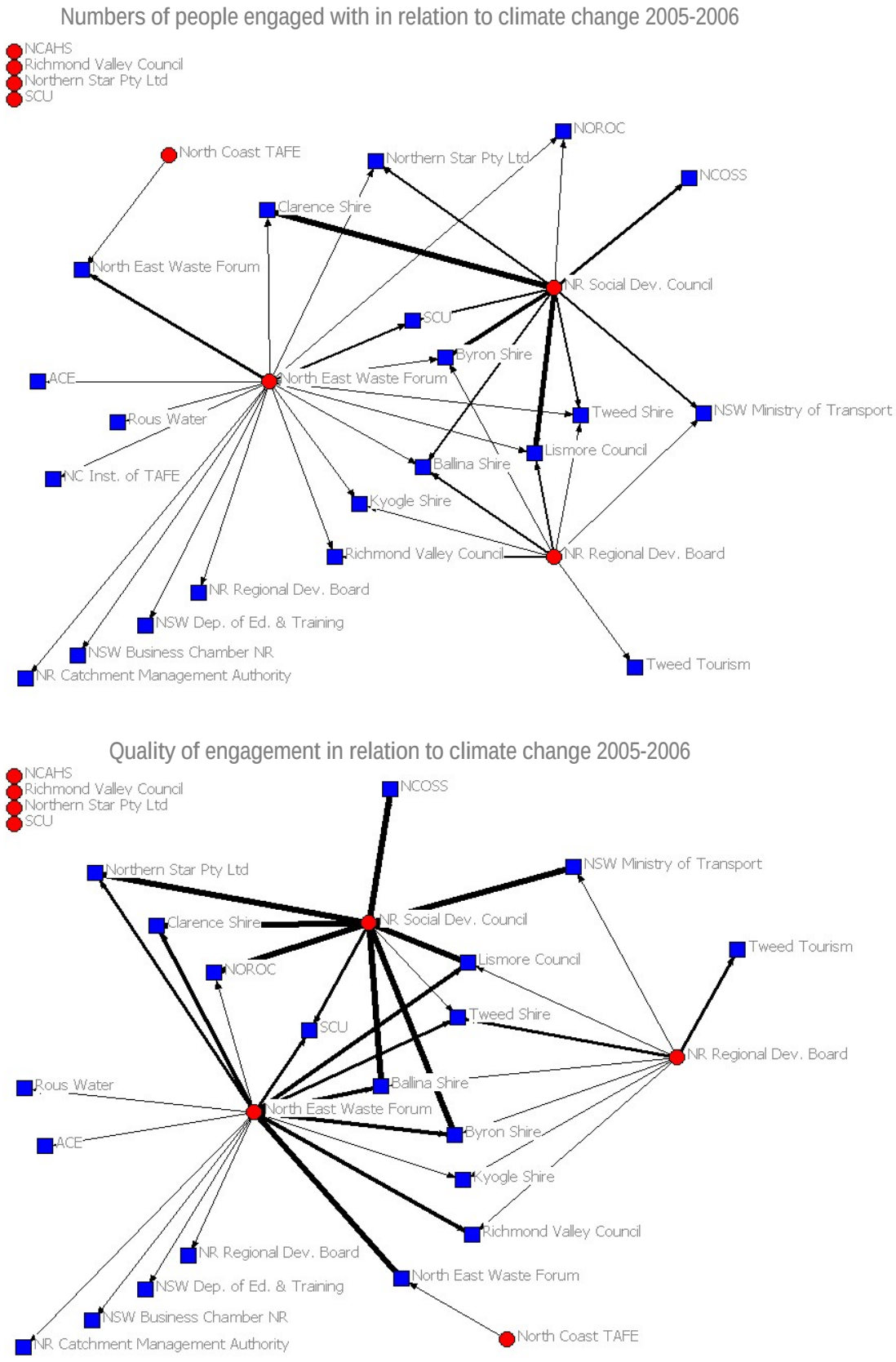


Figure 2: Social networks in relation to climate change 2005 – 2006

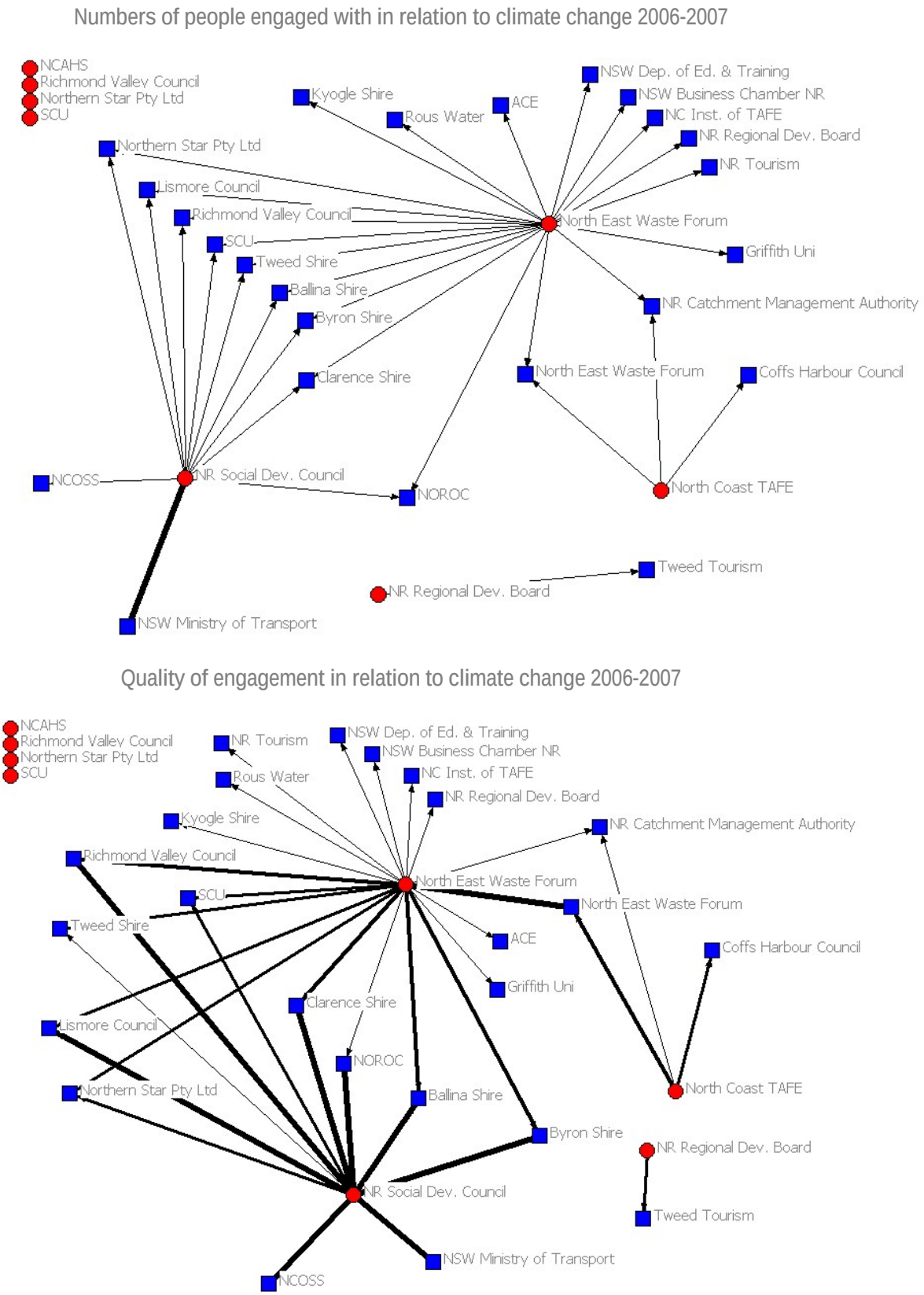
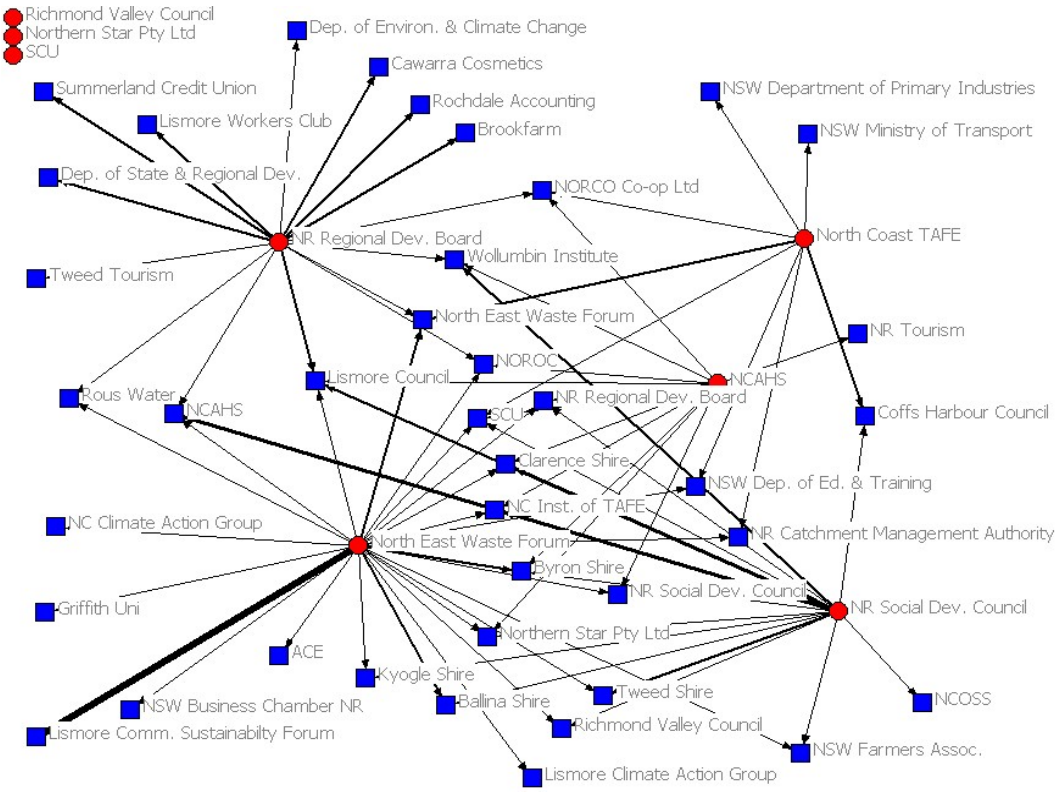


Figure 3: Social networks in relation to climate change 2006 – 2007



Quality of engagement in relation to climate change 2007 - 2008

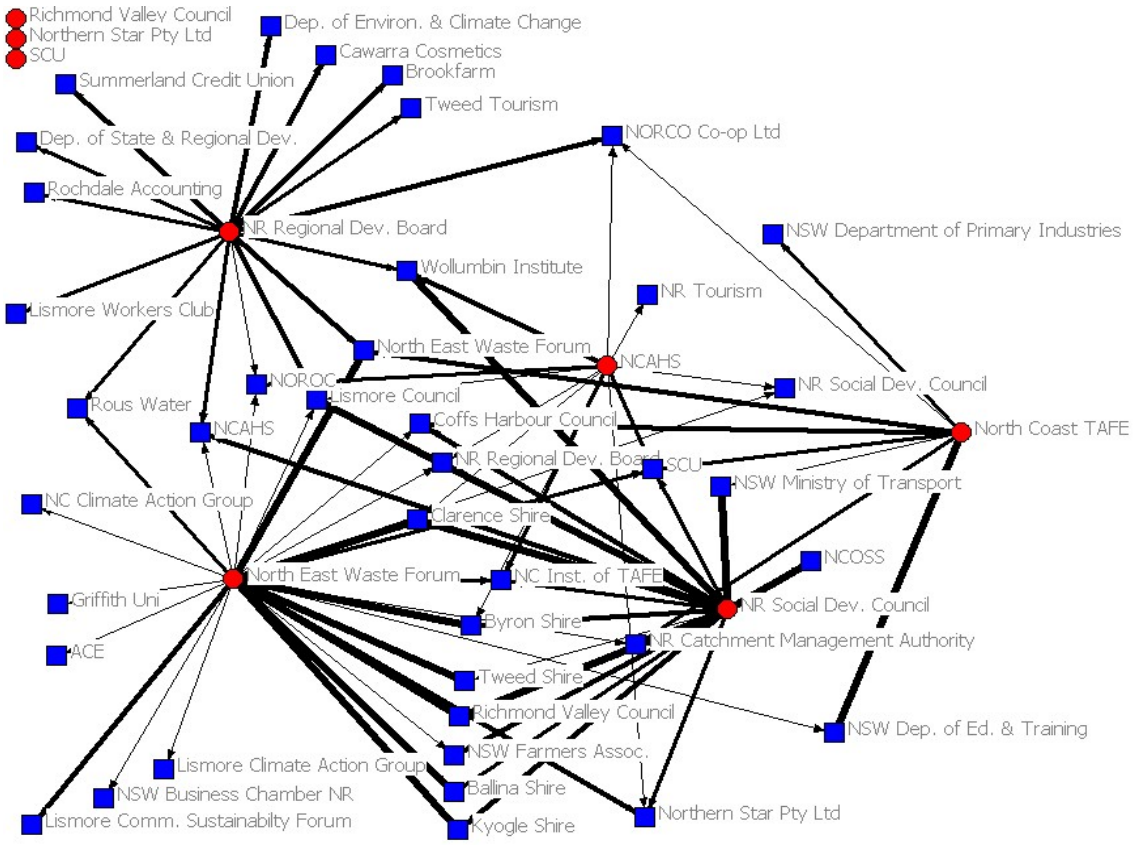


Figure 4: Social networks in relation to climate change 2007 – 2008

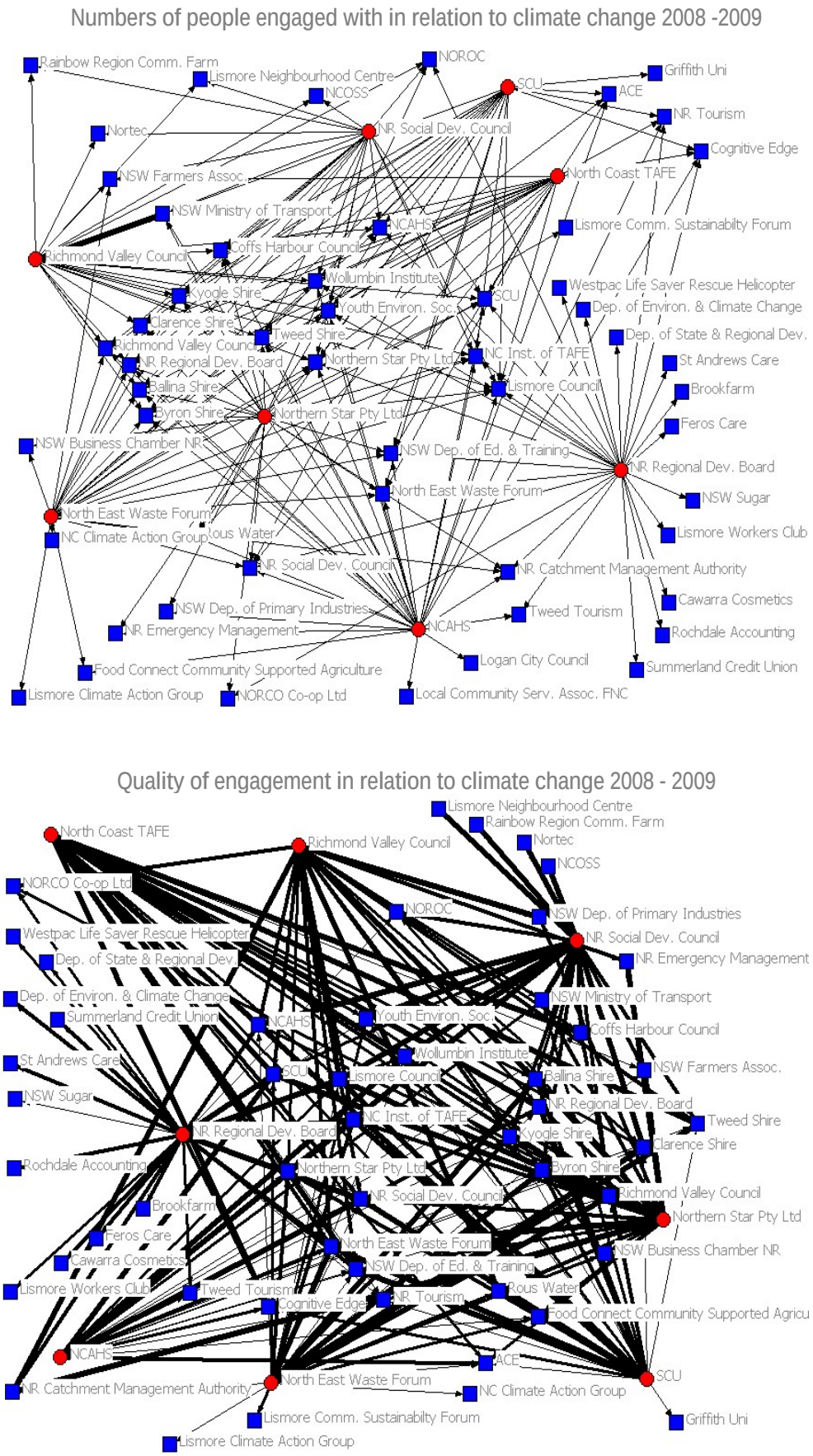


Figure 5: Social networks in relation to climate change 2008 – 2009

Reflecting on the *Northern Rivers Climate Change Collaboration*

The graphic representations provided by social network analysis show that there has been a significant growth in network connections in relation to climate change since the development of the NR3C, and that these network connections have grown in terms of quantity and quality. The growth in network connections is matched by outcomes described above.

The bringing together of such disparate organisations into a focussed regional effort to address climate change is an achievement, particularly since there has not been a strong history of regionalism. In this, the NR3C benefitted from the leadership and commitment of senior executives who enabled the participation of their organisation and from the skills and creative engagement of those who helped the NR3C evolve through working groups, all achieved via the in-kind contributions of participating organisations.

The evolution of the NR3C provides a case study for the relevance of complexity theory to cooperative social enterprise. It is apparent that the *response diversity* provided by the engagement of such different organisations has been a source of strength, and has enabled the emergence of novelty in project design, as will be described in the following section.

The strength that comes from diversity became particularly evident when differences emerged that could have prevented the ongoing development of the collaboration. The North Coast Institute of TAFE, which has built internal capacity to problem-solve through the adoption of methods based on complexity theory, was able to provide skilled facilitators on two occasions. For the NR3C planning workshop, they were able to recommend an external consultant skilled in the use of a conceptual framework for planning and organising that was based on complexity theory. The practical application of this model, known as the *Cynefin Framework*, is described in the following section [11].

ENABLING AND DEVELOPING PROJECTS

The second component of Resilience was the generation of demonstration projects to increase transport options and build food resilience. There is an underlying factor linking obesity and climate change: too little personal energy expended and too much food energy consumed in the case of obesity; and too much fossil fuel energy burned and waste emissions given off in the case of climate change [12]. In designing the *Resilience* project, we anticipated that building a collaboration would lead to practical projects to mitigate and adapt to climate change *and* improve the social determinants of health. We were interested to develop partnership projects to:

1. Increase transport options in the region: to reduce greenhouse emissions, to increase physical activity, and to increase the adaptive capacity, or resilience of the population;
2. Increase local production of food for local consumption: to reduce greenhouse emissions; to increase access to affordable healthy food; and to increase the adaptive capacity of the population in relation to food security.

However, since the outcome of collaboration is *emergent* from the interaction, we did not know in advance what those projects, arising in the space between the organisations, would be.

One of the outcomes of the *Resilience* project has been the adoption of the *Cynefin Framework* by North Coast Health Promotion as a way of fitting intervention to the operative context [11]. This conceptual tool, based on complex adaptive systems theory, was used by the NR3C in developing the *Sustain Northern Rivers* action plans, and is now increasingly used in framing up planning in North Coast Health Promotion. It distinguishes between domains in which cause-and-effect relationships are known (simple and complicated domains), and domains in which cause-and-effect relationships are not perceived (complex and chaotic) [11].

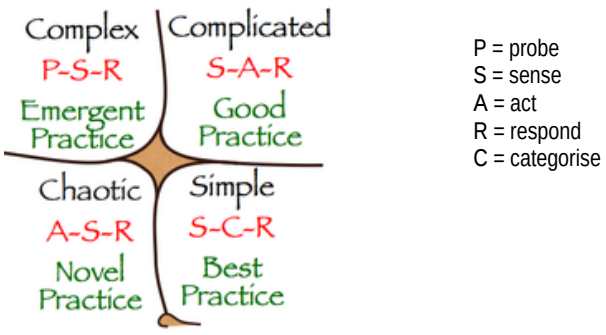


Figure 6: The Cynefin Framework: choosing methods that match contexts

Practitioners in Health Promotion typically design programs based on a body of knowledge that informs best practice in population intervention. The particular body of knowledge describes cause-and-effect relationships, and this enables the strategies to be determined in advance. However, climate change and obesity are phenomena that are so complex that over-specification of strategies in advance may hinder the kind of emergent responses that are most likely to break new ground. In the complex domain, the way forward is based on emergent processes.

The projects that were enabled by *Resilience* reflect both kinds of planning. The soft infrastructure described in the previous section has enabled the rapid emergence of a variety of initiatives, including a novel approach to mapping regional commuting, described below. This emergent process demonstrates the value of fitting the intervention to the context. In the case of the NR3C, the fact that strategies were not specified in advance enabled novelty to emerge from the interactive space between agents or organisations. This is contrasted with the *One Car Less* project, also described below, which is more typical of conventional project planning.

Mapping commuter patterns: a novel approach emerges from the NR3C

Car-dependence contributes to rising levels of obesity and atmospheric greenhouse gas. It is *obesogenic*: evidence shows that for every 30 minutes spent in a car each day, the likelihood of obesity is increased by 3% [13]. Conversely, the incidental exercise involved in active transport is good for both our health and the climate. More broadly, access to transport options is a major factor influencing the social determinants of health, and the social and economic resilience of the region. While metropolitan areas in Australia have had some mapping of car dependence and commuting patterns [14, 15], regions lack data on transport patterns and needs.

The NCAHS travel to work survey

The NCAHS *Travel to Work Survey* [16], in the context of the NR3C, provided a springboard for a novel approach to mapping commuting patterns in the region.

In September 2008, North Coast Health Promotion conducted the NCAHS *Travel to Work Survey* to find out what would help NCAHS staff use less fossil fuel and more body fuel to get to work. A total of 1174 staff responded to the survey, which provided useful information to help tailor strategies to increase active transport to NCAHS workplaces: 65% of respondents expressed interest in car-pooling. Staff were also interested in cycling (25%), using bus services (15%), and in walking or using small motorised transport such as moped or scooter (12%). Respondents indicated that they were interested in incentives such as introductions to other prospective car-poolers, or end-of-journey facilities for people who cycle or walk to work.

In a region with limited information about travel patterns, the NCAHS survey provided important information: 19% of NCAHS respondents lived within 5km of their workplace; 37% within 10km; and 35% of respondents lived more than 25kms from their workplace. The most striking result in the survey was the extent of car-dependence: 77% of all the trips in a typical week were solo car journeys.

The 2008 NCAHS *Travel to Work Survey* was developed as a baseline survey for the evaluation of the NCAHS active transport project *One Car Less*, and will be repeated in October 2009 to inform the evaluation of that project. However, when shared with members of the NR3C, it became apparent that it could be used as the foundation of a much more ambitious transport mapping process that could inform transport strategies across the region.

Regional commuter mapping: emergence in action

The NCAHS survey, covering sites large and small along the North Coast, could indicate commuting patterns to settlements in the region, and provide the basis for collaboration with local governments, bus companies, and other organisations interested to increase regional mobility options. The Sustain Northern Rivers plan for *MOVE: increase transport options* recognised that the lack of data on commuting hindered the development of strategies to make optimal use of the limited transport options in the region.

A working group, consisting of NR3C partners NCAHS; SCU; North Coast TAFE; and the Northern Rivers Social Development Council (NRSDC) explored how the NCAHS Travel Survey could be adapted to provide aggregated data that would provide triangulation at settlements. This collaboration rapidly adapted the NCAHS instrument to an online *Travel to Work and Study Survey* using Survey Monkey [17]. Southern Cross University, which took a lead role in this project, provided a bridge to the *Northern Rivers Car Pool Project* and suggested that the online survey could be used as a baseline for that project, which led to the engagement of local government.

The online survey is being conducted for employees from seven local councils; employees and students from Southern Cross University and North Coast TAFE; and employees of NCAHS and the Northern Rivers Social Development Council. The number of respondents currently totals 2,644. The cumulative total will be significantly higher once the largest employer, NCAHS, completes its survey (also follow-up evaluation for *One Car Less*).

Data for the July to August is currently being processed. Reports will be generated for all 11 participating organisations, plus a report which aggregates the data for the Northern Rivers.

Collaboration of the NR3C partners has produced an online survey which is a valuable resource. The novelty in the approach can be seen in current and potential applications:

- It provides evaluation for two separate projects (NCAHS *One Car Less*, and the *Northern Rivers Car Pooling Project*);
- It provides data useful for 11 organisations operating in the Northern Rivers to enable them to develop internal enabling transport strategies;
- It will enable further collaborative work as a result of triangulating the data. For example, in Tweed Heads: by aggregating data from the NCAHS, SCU, TAFE and Tweed Shire Council, it will be possible to see commuting patterns to inform decisions regarding timetabling and bus routes. It will be possible to produce this data for every major town in the Northern Rivers to enable targeted micro-strategies to make better use of the limited transport options that exist;
- The benefits of the collaboration enabled by the NR3C extend beyond the Northern Rivers. Because three of the NR3C partner organisations stretch across or into the Mid North Coast (NCAHS, TAFE, and SCU), a further phase is planned by inviting the five Mid North Coast Councils to participate in the online survey.

One Car Less – a conventional approach to project planning

In contrast to the emergent nature of the regional commuter survey described above, the active transport project called *One Car Less* was planned and initiated by North Coast Health Promotion along more traditional program planning lines, using the model of a project that had been implemented by Ballina Shire Council (Cool Commuters). *One Car Less*, which was launched by the Chief Executive in May 2009, depended on champions coming forward at NCAHS work sites to recruit staff who would take a pledge to leave their car at home at least one working day per week. The project developed resources for site champions including:

- A form for auditing work sites regarding facilities for cycling and walking;
- A Q and A fact sheet to counter common myths about cycling;
- A *One Car Less* pledge form;
- A *One Car Less* certificate and cup bearing the OCL logo for participants;
- Information on how to generate car pools at work sites.

As of 28 September 2009, the project reached its target of pledges, with 205 *One Car Less* pledges received from staff. Of these, 104 said they would carpool; 67 said they would cycle; 58 would walk, and 8 would use public transport. The effectiveness of the project will not be known until it is reviewed in May 2010, one year after its launch, after which an evaluation report will be produced. The *One Car Less* resource kit has been made available to two metropolitan Institutes of TAFE that requested use of resources developed for the program.

Reflecting on the transport projects

Resilience project design anticipated the initiation of two transport demonstration projects: one at regional and one at a local scale. Two projects have been initiated (*Travel to Work and Study Survey* and *One Car Less),* both with regional application.

The development of an aggregated online regional commuter survey contrasted with the project development process for *One Car Less*. The commuter mapping concept arose surprisingly fast from the *Northern Rivers Climate Change Collaboration,* and was developed and implemented with minimal costs. It is important to note that *Regional Commuter Mapping* could not be predicted at the beginning of the Resilience project. In fact, had *Resilience* strategies been over-specified at the beginning, it would not have been possible to rapidly develop the novel approach for commuter mapping in conjunction with the other partner organisations. The surprisingly fast, networked survey development process appears to exemplify what is meant by *emergence* in complexity science literature:

> *When separate, local efforts connect with each other as networks, then strengthen as communities of practice, suddenly and surprisingly a new system emerges at a greater level of scale. This system of influence possesses qualities and capacities that were unknown in the individuals. It isn't that they were hidden; they simply don't exist until the system emerges. They are properties of the system, not the individual, but once there, individuals possess them. And the system that emerges always possesses greater power and influence than is possible through planned, incremental change.* [18]

The concept of *emergence,* as applied in social contexts, will be discussed in the section on organisational learning.

Projects to increase food resilience

The original planning for Resilience anticipated the development of two food projects: one regional and one local. In fact, three projects emerged: one regional, another with broad application across the North Coast, and another that is local in scope.

Food Value Chain Analysis

The Sustain Northern Rivers action plan for building food resilience aims to increase local food production for local consumption, and to increase uptake of sustainable methods of food production. This action plan was developed to fit with the emerging regional Food Links project funded by the Environment Trust. In order to value add to this and other food initiatives, the NR3C partners NCAHS, TAFE and the Wollumbin Institute conducted an analysis of the food value chain, in order to inform strategies to localise food production in the region.

Food Value Chain Analysis was conducted in three phases. First, the stakeholders for current food initiatives were brought together in a meeting hosted by the Northern Rivers Regional Development Board (NRRDB). This gathering included key representatives of a large regional food project funded by the NSW Environment Trust; the *Northern Rivers Food Forum* (an initiative of the NRRDB); and other representatives of food initiatives from the Tweed to the Clarence. With several food initiatives underway or about to be launched, this meeting was valuable for making stakeholders aware of how their initiatives could become complementary. A graphic 'map' of food initiatives was developed and sent to the stakeholders following this meeting (Appendix 5) and the following schema was developed to show components of a sustainable food value chain:

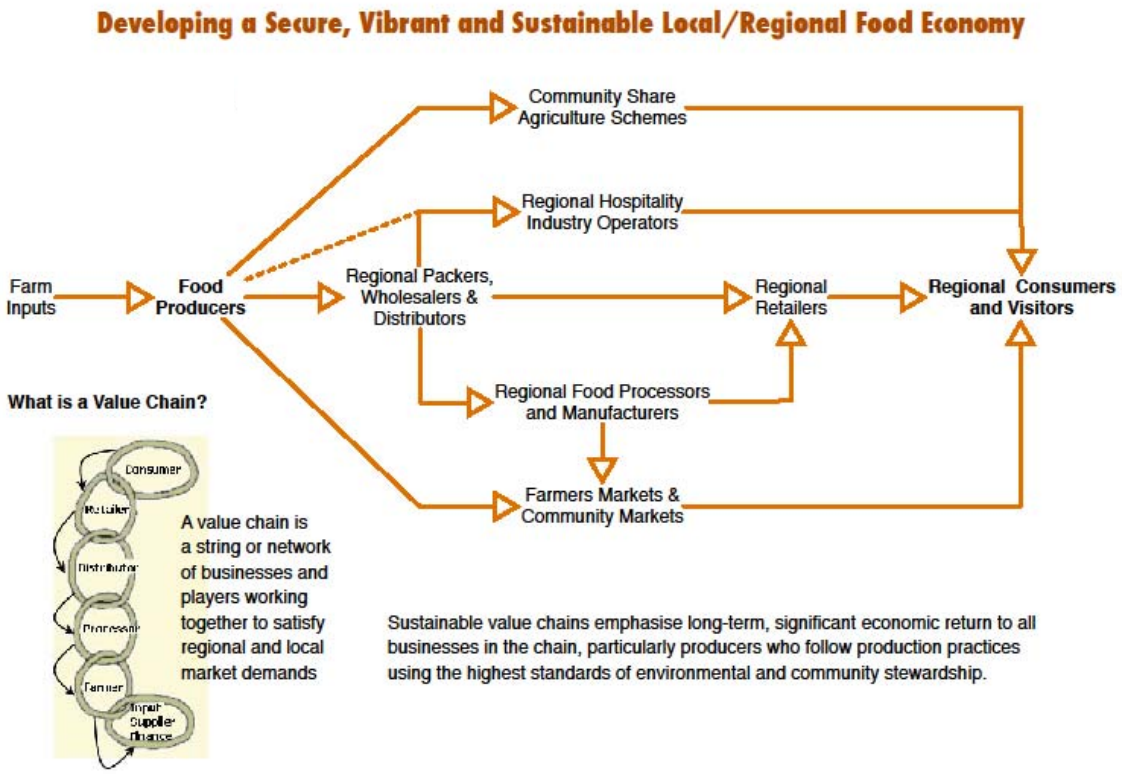


Figure 7: Components of a sustainable regional food value chain

In the second phase, consultations across the region yielded a list of stakeholders who represented each part of the food value chain. A website www.foodresilience.com was created for the purpose of an online poll designed to pick up perceived barriers and enablers of the goal of increasing local food production for local consumption. In addition, structured phone interviews were conducted with respondents chosen for their ability to represent different aspects of the Food Value Chain (FVC). A total of 49 people representing all parts of the Food Value Chain participated in the poll. The responses were themed and summarized in order of significance. ***Barriers to local food production for local consumption*** were perceived to be: 1) Availability, reliability, and quality of supply; 2) Scale and volume of production; 3) Supply chain failures (domination by major retailers); 4) Weak and uneducated demand; 5) Lack of variety and convenience; and 6) Squeeze on farm

incomes. ***Key areas for action*** were perceived to be: 1) Marketing, branding and consumer education; 2) Integration of wholesaling and distribution; 3) Increased product range and availability; 4) More accessible Farmers Markets; 5) Increased volume of production; and 6) Smarter local and state government support.

The third phase of the Food Value Chain analysis was to hold a half-day *Food Resilience Roundtable* in July 2009. This was not an open event; rather, participants were invited to ensure the forum included farmers, food processors, distributors, chefs and other retailers. The stakeholders and consultants developing the NSW Environment Trust *Food Links* project were invited to play an active role in the forum, as were the key drivers of other food initiatives. The sixty participants were given the results of the online and phone poll, then workshopped strategic priorities before moving into working groups to scope the following emergent project ideas:

1. A regional web-based food marketing system;
2. Proactive policy reform;
3. Consumer food education and skills;
4. Regional food branding;
5. Support for sustainable agriculture; and
6. Specialised food products retail outlets.

Since one of the purposes of the Roundtable was to stimulate self-organised action on food initiatives, participants were provided with a list of people interested in developing the project ideas. The consultants developing the *Food Links* business plan were able to include this forum in their consultation process. Because of the size of *Food Links*, *Sustain Northern Rivers* will await public announcement of their business plan before developing any project areas. The project to analyse the Food Value Chain has provided a useful foundation for future food initiatives in the region. A report produced for participants by the Wollumbin Institute details the project ideas scoped during this forum in greater detail [19].

Indigenous Food Gardens

The concept for an Indigenous Food Gardens project emerged during the development of the NR3C. This partnership project involves working with Aboriginal Communities to identify appropriate food crops and then develop food gardens for exchange with other communities and/or supply Farmers Markets. Initiated by North Coast Institute of TAFE, the partners include NCAHS; Department of Primary Industries; and the Northern Lands Council. Members from Indigenous communities who were invited to a stakeholders meeting hosted by TAFE showed enthusiasm for developing the project, and nominated representatives on a steering committee. This committee then conducted further consultation with Indigenous communities, and the Land Council took on the lead role in developing the project. To date, the project development has been limited to consultation within the communities, and site assessments.

Eden at home: a resource for growing backyard food

One ramification of *Resilience* was the reorientation of Health Promotion work to pick up possible collaborations in *climate~health* domain wherever they emerged. One example of this was a partnership that developed with Byron Adult Community Education (ACE) to produce a course package called *Eden at Home* for backyard food production [20]. This course package has been well received and has now been offered to Community Colleges across the North Coast. To date, five colleges have indicated they will run courses based on the resource. Following dissemination of *Eden at Home*, the North Coast Institute of TAFE has initiated partnering with ACE and NCAHS to develop a course on healthy local food incorporating hospitality and horticulture departments; and network connections look to be strengthened further since the *Northern Rivers ACE Cluster* has initiated joining the NR3C.

Reflecting on projects to increase food resilience

A key element of resilience in complex adaptive systems is *response diversity* [4], and the strength of the NR3C is the diversity of organisations who bring different resources together to expedite outcomes. The *Food Value Chain Analysis* is an example of a project that would not have been possible without the diversity of partner organisations. North Coast Health Promotion, lacking experience in food value chain analysis, engaged the Wollumbin Institute to develop and conduct the analysis, and North Coast TAFE joined the partnership for the *Food Resilience Roundtable* which was held at Wollongbar TAFE College.

Eden at Home, although modest in scope, became a useful project that emerged from partnership. Like *Regional Commuter Mapping*, it emerged easily. It seems to demonstrate the *conditions for emergence* described by Seel [21]:

- Connectivity of agents;
- Diversity of agents;
- Rate of information flow (sufficiently rapid and vigorous);
- Lack of inhibitors (anxiety, power differentials, threats to core identity);
- Good boundaries (e.g. time lines);
- Intentionality;
- Watchful anticipation for new phases to emerge that could not be predicted.

MAXIMISING LEARNING

The project to maximise learning was the third component of *Resilience*. The scale of climate change is so great that any successful response requires a transformational effort to move beyond familiar ways of doing business. *Resilience* was a probe into the acknowledged '*complex zone'* of social response to climate change which is characterized by rapid learning and collaboration across knowledge disciplines.

The task was to build capacity to understand the conditions necessary for effective social responses to climate change. To this end, an action learning process was developed that explored complexity theory, which has arisen in knowledge domains as diverse as ecology and natural resource management; mathematics; and organisational theory [22]. Most participants were unfamiliar with this theory at the beginning of the action learning process and many commented that it took some time to understand the concepts. The extent and diversity of discussion reflected a need by participants to integrate unfamiliar concepts by applying them at all levels including personal, organisational, community and global.

The Action Learning methodology involved a web-based, networked learning exchange; group-based reflexive dialogue; and the use of learning histories. This NCAHS action learning project was called *Emergence Thinking.* Its objectives were:

- To develop a shared understanding of Complex Adaptive Systems theory (complexity theory);
- To explore how complexity theory could inform an effective social transformational response to climate change;
- To explore its relevance to our Health Promotion work with populations; and
- To *learn about learning*, and to develop a reflective process.

Emergence Thinking: developing a vehicle for reflexive learning

The *Resilience* Coordinator used the free social networking site *ning.com* to set up *Emergence Thinking* as an interactive website for communication within an online learning circle. A *Core Learning Circle* of eight was convened to review the learning process and the way the initial discussion forums were developing. This group designed the communication that invited people to join the site, and made ongoing decisions on recruitment, membership and website function. In keeping with the concept that adaptive capacity is increased by diversity, the Core Learning Circle had two representatives who were external to Health Promotion. It met six times during the study period. As well as dealing with the practicalities of the web-based learning process, these meetings also explored the implications of the concepts for how organisations functioned, and for the effort to create an effective response to the threat of climate change. The core group's reflections touched on both personal and collective learning.

Ground rules for web-site membership were designed to promote trust, respect and confidentiality. They included an agreement that de-identified postings could be used for research purposes. The postings made between January and June 2009 plus reflections by members of the Core Learning Circle and web-site participants were the basis of a two-stage, thematic analysis to distil a descriptive history of the groups' learning journey.

The web-site was established as an invitation-only networking site and was designed to be eye-catching, stimulating and easily navigated (see Appendix 6). Each forum had a descriptive text section, usually including some thought-provoking questions followed by relevant readings, websites or MP3 files of lectures or presentations by eminent persons in the particular field of thought. Forums and separate discussions included a range of topics.

- ***Introduction to action learning methodology*:** which provided background on action learning and the concept of reflective, or triple loop, learning [23-25]. Another reading on Deep Knowledge Management was uploaded during the course of this discussion [26].
- ***Principles of complex adaptive systems theory and why complexity theory matters now more than ever*:** based on Thomas Homer-Dixon's work [6, 7].
- ***Complex adaptive systems – relevance to health organisational settings*:** provided a link to the Edgeware website, which introduces health professionals to a primer on complexity theory [27]. The introductory text in this forum referred to the work of Stacey, Shaw and Griffin on *Complex Responsive Processes in Organisations* [28], and attached three articles [21, 29, 30].
- ***Basic resilience concepts*:** the first of the forums created when the core group decided to launch a sequence of more focussed topics, originally promoted as a 'curriculum'. The attachments were: Brian Walker's Deakin Lecture podcast on *Resilience Rules*, [5] and G. Marten's *Environmental Tipping Points: a new paradigm for restoring ecological security* [2].
- ***Emergence*:** the goal was to exchange ideas on the concept of *emergence* in organisations and society. Two short articles were attached: Margaret Wheatley, *Using emergence to take social innovation to scale* [18] and Richard Seel, *Emergence in organisations* [21].
- ***Self organisation*:** participants were asked to explore Dee Hock's *The chaordic organisation: out of control and into order* [31] and examples of self-organisation in the Edgeware website [32].

Web-site members of the larger Learning Circle were primarily recruited from North Coast Health Promotion. In order to achieve a diversity of experience and perspectives, a number of other external members were encouraged to join. A total of 29 members joined during the study period of January to June 2009 (18 from North Coast Health Promotion, 11 external consisting of 5 other health staff, 3 academics, 1 local government and 2 independent).

Discussions were wide-ranging and ever-changing in character, replicating the fluid characteristics of dynamic 'tea room' exchange. They generated multiple emergent ideas and constantly morphed or interchanged between parallel forums on related topics. Participation varied between topics and over time. While some members confidently launched into a discussion with little prior understanding or experience of the issues, others, whose later postings revealed that they had a deep understanding of the topic, were initially very reticent to take part. Those who became regular contributors described the development of a strong sense of trust within the community of participants. This in turn generated a sense of shared exploratory learning in frequently unfamiliar conceptual territory.

Learning about learning

Rapid social learning is necessary if we are to make the transformative changes necessary to address climate change. Since learning is so central to adaptive capacity, *Action Learning* is a suitable method for a project to understand the prospects of human responses to climate change. In the first instance, the Core Learning Circle needed to understand *Action Learning*, and reviewed some relevant literature before designing the learning process [24, 25, 33, 34].

Emergence Thinking appears to have been successful in establishing a culture of reflective learning amongst many of those who participated: there was steady development of a reflective practice amongst the web site members from its inception. At the meetings of the Core Learning Circle this was a common theme of discussion, as was the exploration of strategies to promote reflective practice.

A variety of benefits and barriers associated with learning via a social network website were noted. Benefits included the *"contagious"* nature and also the *"richness"* of learning in such a context as well as the ability to *'self pace'* and participate across a large geographic area. Barriers included: fear of self exposure and of revealing intellectual deficiency, plus a feeling that group learning sometimes progressed so fast that it was *"too late"* to catch up.

With respect to website interaction, it was noted that those more familiar with e-based networking were early adopters. There was also a common view that the postings represented only a small part of a much more extensive off-line discussion that was stimulated by the website postings, readings and resources.

On personal skill development, participants said they were learning a *'new language'* derived from complexity theory and now listened differently as a result of their engagement with, and understanding of, reflective learning practices. There was also a sense that new concepts were *'bedded down'* by hearing others speak about them, and that this form of learning operated in a non linear, emergent, *'probe, reflect and error-adjust'* way. From time to time, participants spontaneously reflected back the learning by posting summaries of the

understanding that was emerging from collective discussion. For example, one participant posted the following diagram as “Some understanding so far”:

Figure 8: “some understanding so far”- a diagram posted by a participant

Implications for organisational practice

One way in which participants integrated the new concepts from complexity science was by identifying past and present practice that exemplified concepts described in the readings and audio files. Recent organisational experience became a useful touchstone for testing concepts. A question from one of the independent members provoked exploration of how the concept of *resilience* could be understood when applied to North Coast Health Promotion. When *emergence* was explored, the *Northern Rivers Climate Change Collaboration* was identified as creating the conditions for emergence via increasing the connectivity and diversity of agents [21]. In further exchange on *the conditions for emergence*, the governance system established for the *Resilience* project within North Coast Health Promotion was identified as an example of boundaries combined with a lack of inhibitors.

As the group developed an understanding of complexity theory by reflecting on their organisational experience, participants explored how this theory might enhance organisational function. A main discussion thread developed around the need to distinguish between conventional, pre-planned approaches to project development, and flexible approaches where the *'Good Enough Vision'* is accompanied by the conditions for emergence. The group used tools in the *Edgeware* website [32] to understand the application of complexity theory in social contexts. The Edgeware tool of *minimum specifications* was the focus of some discussion: this concept was seen as useful in that it described conditions under which innovation could emerge through the networked connectivity of agents, if the rules constraining innovation were kept to the minimum.

There was considerable discussion around the observation that *'command and control'* management systems combined with over-specification will suppress innovation. The *Edgeware* tools were seen as helpful to distinguish methods appropriate to contexts. The *Cynefin* framework [11], a conceptual tool which had been introduced to the NR3C by North Coast TAFE, was incorporated into discussions, and is now increasingly used in framing up how strategies are developed for different aspects of Health Promotion work:

Implications for climate change and global Issues

In the course of learning about a new conceptual framework, broad discussions emerged which showed how reflective engagement with complexity theory shaped how participants thought about climate change, and about the prospects of minimising harmful human impact on natural systems. An understanding of complex adaptive systems was seen as a valuable lens for understanding the natural world and human societies, and the collective effort to respond to climate change.

The group became comfortable with questioning long held assumptions and saw the combination of *action learning* and *complexity theory* as a good praxis/theory platform for addressing complex challenges. There was a growing awareness of the relevance of

connectedness and indivisibility, with discussions on Deep Ecology [26]. This linked with Indigenous paradigms that emphasise being 'part of' rather than 'separate or dominant to'.

Participants expressed their thoughts on the ethical and psychological dimensions of what is happening to *'earth's life support systems'*; and their feelings of attachment to *'what we had'.* They raised awareness of how global and local events reflect the adaptive cycle described in complex adaptive systems theory, and shared how they had subconsciously implemented changes in their day to day practice such as using the car less. There was also raised awareness regarding the links between Health Promotion and action to address the over consumption threatening natural systems. In the context of exploring the concepts of complexity, discussions emerged which ranged over issues as diverse as: the justification of environmentally damaging actions; the pursuit of economic growth; the human capacity for denial; and the ability to compartmentalise thinking in order to continue with *'business as usual'* in the face of compelling evidence that fundamental change is urgent.

A wide range of perspectives and actions were highlighted as having value. Some concerned philosophical orientation, such as adopting the act of *'living a good life'* as opposed to the *'quest for individual happiness'.* Staying positive and believing our actions can change things for the better was seen as a *'core challenge'*. Participants expressed growing awareness that global events are interconnected, compounding and non linear, and that complexity science provides a way of understanding these interconnections as well as a basis for taking positive action. Some of the large reported shifts in thinking came from members who had not made postings, but who had studied one or more of the texts and simply observed the posted discussions.

Finally, a sense of optimism was expressed: a belief that by engaging with the new concepts and values there was an opportunity for the organisation and humanity to tackle some of the most challenging issues they face.

> *"There has been so much learning in relation to our organisation I don't know where to start. The concepts of minimum specifications, self-organisation, Clockware/Swarmware (from Cognitive Edge, Edgeware), invite diversity...I can see how we can apply these and deepen our understanding of how best to work creatively together."*

> *"I loved that the concepts were so different and therefore seemed challenging at first. To me it meant that Complexity Theory really is a NEW paradigm…It gives me hope that we humans can evolve to live in an Ecology without killing it."*

Reflections on the *Emergence Thinking* action learning process

This action learning component evolved in an unanticipated way, as those involved realized that complexity science has value in understanding how to generate cooperative human problem-solving: the root issue of climate change. *Emergence Thinking* therefore focussed on the usefulness of complex adaptive systems theory for understanding resilience and innovation. Some unexpected convergence occurred when North Coast Institute of TAFE brought facilitation skills based on complexity theory to assist with problem-solving when the Northern Rivers Climate Change Collaboration (NR3C) encountered the kinds of difficulties that typically emerge in collaboration between organisations with modes of functioning. North Coast Health Promotion is now partnering with North Coast Institute of TAFE and the *Leading for the Future* (an invitation-based Transition Leadership Network) [35] to bring professional development in this methodology to the Northern Rivers.

The organisational learning history of the first six months of *Emergence Thinking* shows that the action learning project was effective for those who actively engaged. There are also strong indications that the beneficial effects were more far-reaching. A cohort within the NCAHS Health Promotion team has now adopted a practice of reflexive learning. There is now also frequent discussion about how complexity theory might inform the way organisations function and to human capacity to mount an effective response to the urgent challenge of climate change.

The initiative has sparked discussion about how *Emergence Thinking* might now be extended more widely within North Coast Health Promotion and among partners engaging with climate change. The learning history conducted for this action learning project highlights both the usefulness of complex adaptive systems theory, and of action learning as process for integrating what is for many a new paradigm for understanding social processes.

CONCLUSION AND RECOMMENDATIONS

The evaluation of *Resilience* confirms the value when working in the complex domain, of exploratory probes with over-arching goals that do not over-specify intermediate objectives and strategies. The project has generated practical outcomes on a number of levels.

The graphic representations provided by social network analysis show that there has been a significant growth in network connections in relation to climate change since the development of the NR3C, and that the growth of network connections mirrors a growth in outcomes which are:

- A framework agreement for an integrated regional response to climate change [1];
- A functional governance structure which devolves action to working groups;
- The adoption of *Sustain Northern Rivers* (SNR) as the action program of the NR3C, with four priority areas;
- The development of action plans whose scope matches the current NR3C resource base, but which have the capacity to expand if the NR3C is able to attract resourcing;
- Completion of some action plan strategies (Food Value Chain Analysis and 10 organisations participating in the Commuter Mapping survey;
- The hosting the *Michael Shuman Forum* and the *Food Resilience Roundtable*;
- A valuable media partnership and the adoption of branding *Sustain Northern Rivers*;
- Continuing expansion in terms of membership;
- The emergence of innovative projects; and
- Demonstrated capacity to problem-solve, using methods based on complexity theory.

The evolution of the NR3C provides a case study for the relevance of complexity theory to cooperative social enterprise. It is apparent that the *response diversity* provided by the engagement of such different organisations has been a source of strength, and has enabled the emergence of novelty in project designs.

Response diversity was a significant enabling factor in two of the food projects: *Food Value Chain Analysis*, and *Eden at Home*, a resource for growing backyard food. Both projects have produced useful contributions to the broader *Sustain Northern Rivers* goal of *Food Resilience*. A third food project, Indigenous Food Gardens, is still in its infancy.

The *Resilience* project has enabled the development of two contrasting projects to reduce car dependence and increase transport options. *One Car Less*, an active transport project

for NCAHS, was developed in North Coast Health Promotion and followed a conventional health promotion development process. The project is on target with respect to strategies and participation. Outcomes will not be known until the conclusion of the project. The *One Car Less* resource package has been shared with other organisations wanting to increase active transport.

The development process for *Northern Rivers Commuter Mapping* contrasts with that for *One Car Less.* This innovative approach to aggregating online data from major employers exemplifies what is meant by *emergence* in complexity science literature:

> *'When separate, local efforts connect with each other as networks… suddenly and surprisingly a new system emerges at a greater level of scale. This system of influence possesses qualities and capacities that were unknown in the individuals… they simply don't exist until the system emerges. They are properties of the system, not the individual, but once there, individuals possess them. And the system that emerges always possesses greater power and influence than is possible through planned, incremental change.'* [18]

The urgent need to accelerate the change to sustainable ways of living and working requires us to understand better the conditions which promote rapid innovation. The *Commuter Mapping* project is novel, it arose surprisingly fast from the *Northern Rivers Climate Change Collaboration,* and was developed and implemented with minimal costs. This project *could not be predicted* at the beginning of the Resilience project. In fact, had *Resilience* strategies been over-specified at the beginning, it would not have been possible to rapidly develop the novel survey approach in conjunction with the other partner organisations. Reflecting on the quote above, One Car Less may be typical of *'planned, incremental change'*, while *Commuter Mapping* demonstrates the power of enabling emergent initiatives.

Perhaps the most surprising element in *Resilience* came from the use of Action Learning methodology to explore how complex adaptive systems theory might be useful in accelerating social responses to climate change, and in creating the conditions for population health. The learning history conducted for this project highlights both the usefulness of complex adaptive systems theory, and of action learning as a *process* for integrating what is for many, a new paradigm for understanding social processes.

Complexity theory can inform how we organise. It has implications for the way we plan and operate within organisations and between organisations. The experience of North Coast Health Promotion is that complex adaptive systems theory represents a paradigm shift. The concepts take time to understand and integrate. However, the use of action learning methodology served well to facilitate a cultural shift to embrace a new explanatory paradigm.

Where to from here?

The substantive achievement of *Resilience* has been its supportive role in the evolution of the *Northern Rivers Climate Change Collaboration* and its action program, *Sustain Northern Rivers*. The soft infrastructure created via the NR3C enables innovation. The collaboration has demonstrated a capacity to manage difference, and has developed action plans commensurate with its limited resource base.

There have been some instances where the NR3C had difficulty convincing some local governments and regional organisations of the value of its mission and of *Sustain Northern Rivers*. The NR3C made a decision to continue developing SNR in order to have some practical achievements to share with prospective members. Now that strategies in the action plans are underway, and SNR branding is settled, the NR3C will make a presentation to the Regional Coordination Management Group. It is also re-initiating engagement with local governments that have not participated to date. While the action plans for SNR are modest in scope, there is great potential for expansion. The partner organisations recognise the limitations of in-kind contributions as a resource base.

With respect to the action learning program within North Coast Health Promotion, the cohort engaged with this process recognises that there is much more work to be done in terms of understanding the application of complexity science to the work of bringing about change at whole-of-population scale, dependent on resourcing. The process of engagement initiated by *Resilience* will continue in several ways: *Emergence Thinking* is likely to continue as an action learning process, and six staff members are undertaking training to develop some mastery of the methods that proved so successful in helping the NR3C move beyond difficulties in its early stages. This training involves use of *SenseMaker Software* in researching the conditions that help people shift from inaction to action in relation to climate change [36]. The key endeavour in climate change is how to get humans problem-solving at every scale: household, organisational, industrial, and across all scales of governance including regional. The most fundamental problem is human capacity to work collectively.

The experience of Resilience has affirmed the value of Health Promotion engaging with other organisations to develop regional and local responses to climate change, not just because climate change poses a threat to the social determinant of health, but because the danger of climate change is such that it requires all organisations to bring their resources and expertise into energetic, purposeful partnership to prevent what Professor Ross Garnaut described as

> *'…consequences that would haunt humanity until the end of time'.* [8]

Health Promotion, with its expertise in whole-of-population change, has much to bring to the problem-solving table.

Recommendations:

1. That the NSW Department of Environment, Climate Change and Water enters into a partnership with the *Northern Rivers Climate Change Collaboration* to develop its potential as a model for regional responses to climate change;
2. That the NSW Department of Environment, Climate Change and Water resources a project officer, responsible to the *Northern Rivers Climate Change Collaboration,* for a period of three years, to develop *Sustain Northern Rivers*;
3. That North Coast Health Promotion disseminate what has been learnt from *Resilience* in the field of Health Promotion via journals and other means of communication;
4. That North Coast Health Promotion continues to advocate for the active engagement of Health Promotion practitioners in collaborative efforts to mitigate and adapt to climate change;
5. That North Coast Health Promotion and the NSW Department of Environment, Climate Change and Water collaborate to research the *'tipping points'* for individuals, organisations and communities to engage in action to prevent climate change, using SenseMaker Software Suite and methodology, based on complexity science.

GLOSSARY

Abbreviations

ACE	Adult Community Education
R&E	Research and Evaluation team in NCAHS Health Promotion
HP	Health Promotion
FVC	Food Value Chain
NCAHS	North Coast Area Health Service
NR3C	Northern Rivers Climate Change Collaboration
NRRDB	Northern Rivers Regional Development Board
SCU	Southern Cross University
TAFE	North Coast Institute of TAFE
WI	Wollumbin Institute

Terms

Cynefin — *"A model that provides a taxonomy that guides what sort of explanations and/or solutions apply… in different contexts. The Cynefin framework draws on research into complex adaptive systems theory, cognitive science, Anthropology and narrative patterns…. and proposes new approaches to communication, decision-making, policy-making and knowledge management in complex social environments."* [11, 37]

Emergence — *"The arising of new, unexpected structures, patterns, or processes in a self-organizing system. These emergents can be understood as existing on a higher level than the lower level components…. In organizations, emergent phenomena are happening ubiquitously yet their significance can be downplayed by control mechanisms grounded in the officially sanctioned corporate hierarchy. One of the keys for leaders from complex systems theory is how to facilitate emergent structures and take advantage of the ones that occur spontaneously."* [32]

Resilience — *"the capacity of a system to absorb disturbance, undergo change and still retain essentially the same function, structure, identity, and feedbacks"* [4, 5]

Response Diversity

"The range of different response types within a functional group…This aspect of diversity is critical to a system's resilience" [4]

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APPENDIX

Appendix 1: The Agreement

Northern Rivers Climate Change Collaboration Agreement

Preamble

The signatories to this agreement acknowledge and honour the heritage and custodianship of the traditional owners of the lands in the region known today as the Northern Rivers of New South Wales.

The signatories also acknowledge the almost unanimous warnings by the international scientific community that human impacts on the planet's biosphere are likely to result in severe changes to global climatic conditions that will adversely affect the lives and wellbeing of present and future generations for the foreseeable future.

The signatories accept their separate and collective responsibility to offer leadership to the people of the Northern Rivers region to take action now to prepare for and meet the challenges of climate change. We believe these challenges also represent opportunities to make a transition to more sustainable ways of living and working, and commit ourselves to identify and realise these opportunities.

By entering into this agreement, the signatories commit to actively engage the whole community in action on climate change. We believe community engagement and the fostering of stakeholder partnership is essential to strengthening the social and economic resilience of the region.

We also accept the responsibility of the Northern Rivers region to make its best possible contribution to achieving national and global climate change mitigation, adaptation and sustainability transition objectives.

Objectives

The signatories to this agreement commit themselves to the following common objectives:

- To achieve the widest possible community involvement in formulating specific climate change mitigation, adaptation and sustainability transition goals and targets for the Northern Rivers region.
- To encourage, support, and enable the communities, institutions, organisations and businesses of the region to undertake their own climate change action initiatives in support of the regional goals and targets.
- To jointly advocate for measures to strengthen the resilience of regional communities and businesses, build the region's social, economic, and natural capital, and promote ecologically sustainable ways of living and working.
- To promote the opportunities that climate change offers the region to fashion a new ecologically sustainable, diverse, and creative economy capable of fulfilling the material and cultural needs of present and future generations.
- To establish and monitor key indices of sustainability in the region and review the regional climate change goals and targets against these indices and evolving national and international standards.

Guiding Principles

In pursuing these objectives the signatories to this agreement will observe the following principles:

- **Respect for Aboriginal heritage and values**

  The signatories honour the region's Aboriginal heritage, custodianship and values of caring for country and community as fundamental to living sustainably.

- **Communication, consultation and collaboration**

  The signatories commit to on-going communication, consultation and collaboration in matters related to climate change policy, planning, strategy development, and resource allocation.

- **Community engagement**

  The signatories will seek to engage all sections of the community in understanding and formulating responses to climate change.

- **Stakeholder partnerships**

  The signatories will foster the development of collaborative climate change partnerships between diverse stakeholder groups across the region.

- **Learning opportunities**

  The signatories will act to build the learning capability of our communities, workplaces, and organisations and promote access for everyone to the skills and knowledge necessary for sustainability.

- **Information sharing**

  The signatories will promote the sharing of information on climate change impacts, policies, planning and the availability of resources.

- **Innovation**

  The signatories will encourage innovative and integrated approaches to realising climate change related economic, social and cultural opportunities for the region.

- **Efficient use of resources**

  The signatories will avoid wasteful duplication of effort and will collaborate to achieve the most efficient and equitable deployment of available resources.

- **Voluntary collaboration**

  This framework agreement is intended to guide the voluntary collaboration between the signatories and should not be construed as in any way creating legal obligations or duties.

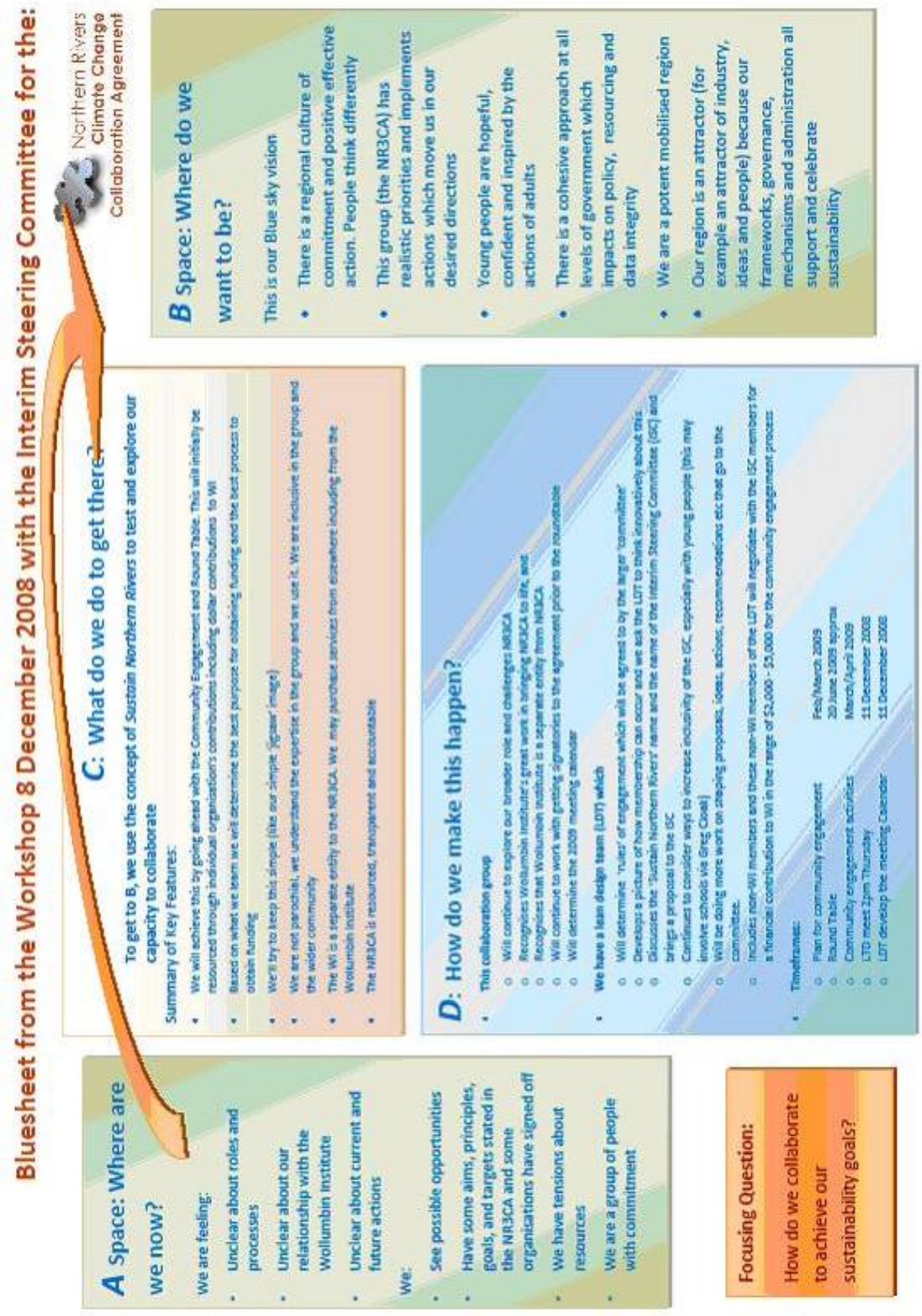
Mechanism

The signatories to this agreement will each appoint a representative to a Steering Committee that will be the principal forum for on-going strategy development, co-ordination and governance of their collaboration in pursuit of the objectives of this agreement.

The Steering Committee's mission will be to engage stakeholders and communities in setting agreed climate change action goals and targets for the region and then to promote and support local self-organised initiatives to advance these goals. The form of this stakeholder and community engagement process is set out in Schedule 1 to this agreement.

The Steering Committee will have the authority to form such working groups and sub-committees as it considers necessary to advance the purposes of this agreement and to make recommendations to the signatories to the agreement. It will be empowered to amend Schedule 1 as it considers necessary.

Appendix 2: The Bluesheet - problem solving



Appendix 3: Sustain Northern Rivers Action Plans

The Sustain Northern Rivers Resource Efficiency Action Plan

Project Leader: Kirsty Howton
Team members: Katrina Luckie, Elizabeth McGregor

Resource Efficiency Goals

To empower and enable the Northern River's community to reduce the region's ecological footprint

- To reduce household water consumption
- To reduce household energy consumption
- To reduce household waste disposal to landfill

Resource Efficiency Action Plan

STAGE 1

Action Plan for stage 1 focus is to encourage household behavioural change to reduce energy and water usage and waste disposal to landfill. Actions have been identified for:

1. Resource Efficiency Communications Program
2. Resource Efficiency Research, Data and Information Program
3. YGreen* program to enable behavioural change in a targeted community
4. Sustainability Advantage# program to enable behavioural change in local businesses
5. Inform consumers of options for renewable energy & energy innovation in the Northern Rivers

STAGE 2

To examine opportunities for alternative/decentralised supply systems, green jobs development and develop a second stage action plan in mid 2010

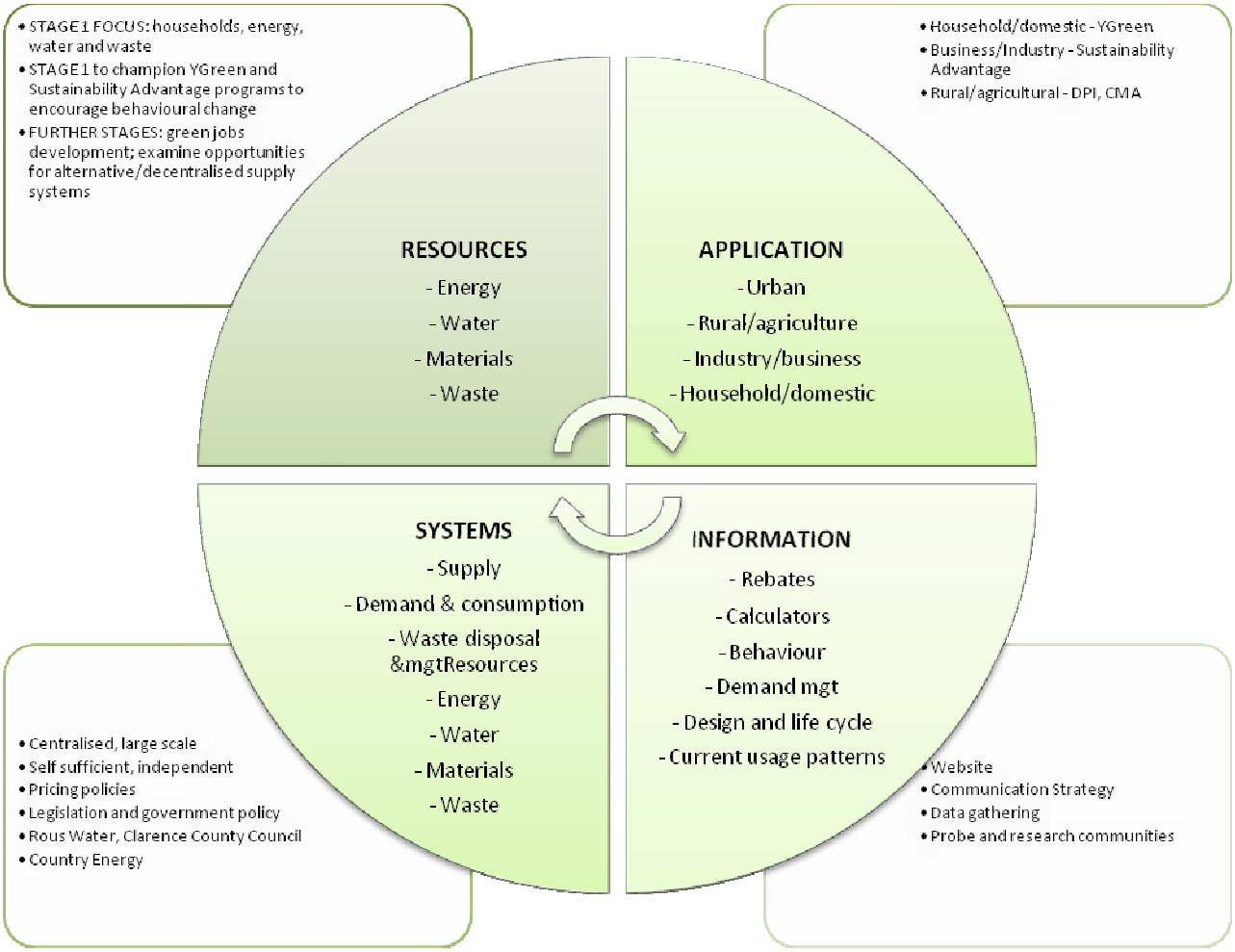
*** YGreen**

North Coast Institute of TAFE is working with the Dusseldorp Skills Forum to trial the YGreen Project in regional NSW. This is a home sustainability project that trains young people to become home sustainability advisers and provides paid employment to conduct assessments in their local community. The goal of the project is to engage young people in green skills employment opportunities and in doing so, reduce carbon emissions from the residential sector and initiate a residential green census (in the area of implementation).

 # Sustainability Advantage

Northern Rivers Regional Development Board has been working with NSW Department of Environment and Climate Change in delivering the Sustainability Advantage program to local businesses. This is a 12-18 month continuous improvement program to assist businesses to manage environmental risk, use resources more efficiently and integrate environmental strategies with business planning and operations.

Resource Efficiency Systems Map



Communications	Research, Data, Information	Behavioural Change
• Website • Communication Strategy • Resources, Tools, Rebates, Support	• Current benchmarks • Targets • Mapping footprints	• Household/ domestic - YGreen • Industry/ business - Sustainability Advantage

1. RESOURCE EFFICIENCY COMMUNICATIONS PROGRAM					
Actions	**Cynefin Framework Category**	**Timelines**	**Partners**	**Resource Implications**	**KPIs Accountabilities /KPIs**
a. Sustain Northern Rivers website to provide information on resource efficiency support programs, supply systems and options, government rebates - local, state and national etc	Simple	May – Dec 2009	Enabling team to advise	In-kind time YGreen will document all local programs	Website online Website usage data No. referrals to existing programs
b. Information on website and YGreen delivery to inform communicatio n strategy	Simple	May – December 2009	Enabling Team	To be determined by Enabling Team	To be determined by Enabling Team
c. Website to link household footprint calculators	Complicated (research to identify appropriate and useful calculators)	Jan – Dec 2010	SCU Others to be determined	Environment Trust EOI Links to YGreen actions	To be determined if resources secured
d. Develop website mechanism to compare household calculator results to regional data	Complex	April – June 2010	To be determined	$2,000 - $5,000	To be determined System to capture local data

2. RESOURCE EFFICIENCY RESEARCH, DATA AND INFORMATION PROGRAM					
Actions	Cynefin Framework Category	Timelines	Partners	Resource Implications	KPIs Accountabilities /KPIs
a. Collect and collate regional data to understand current status Identify regional average household footprint Idenfify alternative resources including energy supply options and take-up	Complicated (data gathering, research and manipulation to determine local measures)	May – December 2009	Country Energy Rous Water Clarence County Council NEWF ABS SCU	In-kind time Explore internship/ student project	Per capita or per household: ▪ KWh ▪ KL ▪ Volume to landfill ▪ Volume diverted from landfill Also aggregated by: ▪ industry and domestic; ▪ urban and rural ▪ Number of Solar PV connections (Country Energy) ▪ GreenPower uptake
b. Identify and set	Complicated	Jan – Mar	Collaboration	In-kind time	Energy, water and

water, energy and resource efficiency targets		2010	partners		resource efficiency targets for Northern Rivers region
c. Map ecological footprint for a community to assess either: ▪ behavioural change to an intervention; and/or ▪ capacity to map regional ecological footprint	Complex (conduct a probe in one community to investigate and quantify inputs and outputs and determine local ecological footprint methodology)	April – June 2010	Community resilience team Identified community SCU	$40,000 – needs to be secured	Resources secured Ecological footprint mapping for identified community
3. YGREEN PROGRAM TO ENABLE BEHAVIOURAL CHANGE IN A TARGETED COMMUNITY					
Actions	**Cynefin Framework Category**	**Timelines**	**Partners**	**Resource Implications**	**KPIs Accountabilities /KPIs**
a. Secure program sponsor to trial YGreen in region	Simple	May – July 2009	TAFE SCU NRRDB/NRRDA	In-kind time	Program sponsor commitment of $55,000
b. Trial YGreen in regional community to conduct household sustainability assessments	Simple	Aug – Dec 2009	Dusseldorp Skills Forum TAFE SCU Country Energy Rous Water NRRDB/NRRDA	$85,000	No. students No. Household assessments Behaviour change (measured through household follow up)
c. Conduct probe to examine possible self-funding mechanism for YGreen program to be expanded through website	Complex (examine willingness to pay by communities for YGreen Household Sustainability Assessments by registering on website)	Sept – Dec 2009	Northern Star TAFE SCU Country Energy NRRDB/NRRDA Enabling team		Willingness to pay for YGreen Household Sustainability Assessments
d. Expand YGreen to other communities	Simple	Jan – Dec 2010	TAFE SCU	Securing additional program sponsorship	Program sponsorship funding
e. Assess YGreen integration with Schools Sustainable Environmental Management Plans	Complex (examine possibility to extend assessments to school facilities, not just households)	Feb – April 2010	Dusseldorp Skills Forum TAFE SCU DET YES	To be determined	Tools for sustainability assessments for school facilities

4. SUSTAINABILITY ADVANTAGE PROGRAM TO ENABLE BEHAVIOURAL CHANGE IN LOCAL BUSINESSES					
Actions	**Cynefin Framework Category**	**Timelines**	**Partners**	**Resource Implications**	**KPIs Accountabilities /KPIs**
a. Continue to implement	Simple	March – Dec 2009	NRRDB DECC	DECC consultants	Business data

Sustainability Advantage Resource Efficiency Module			Local businesses	Business Resource Efficiency Teams	
b. Promote local business benefits and successes	Simple	Sept – Dec 2009	NRRDB Local businesses	In-kind time	Media coverage
c. Recruit additional businesses and expand the Sustainability Advantage Program in the region	Simple	Sept – Dec 2009	NRRDB DECC	In-kind time	No. new business sign ups

Sustain Northern Rivers: NR3C Enabling Action Plan

Project Team: Alicia Bales (NCTAFE), Sue Short (APN), Lynne DeWeaver (NRRDB), Tony Davies (NRSDC), Keith Larson (DET), Stuart Willows (DET)

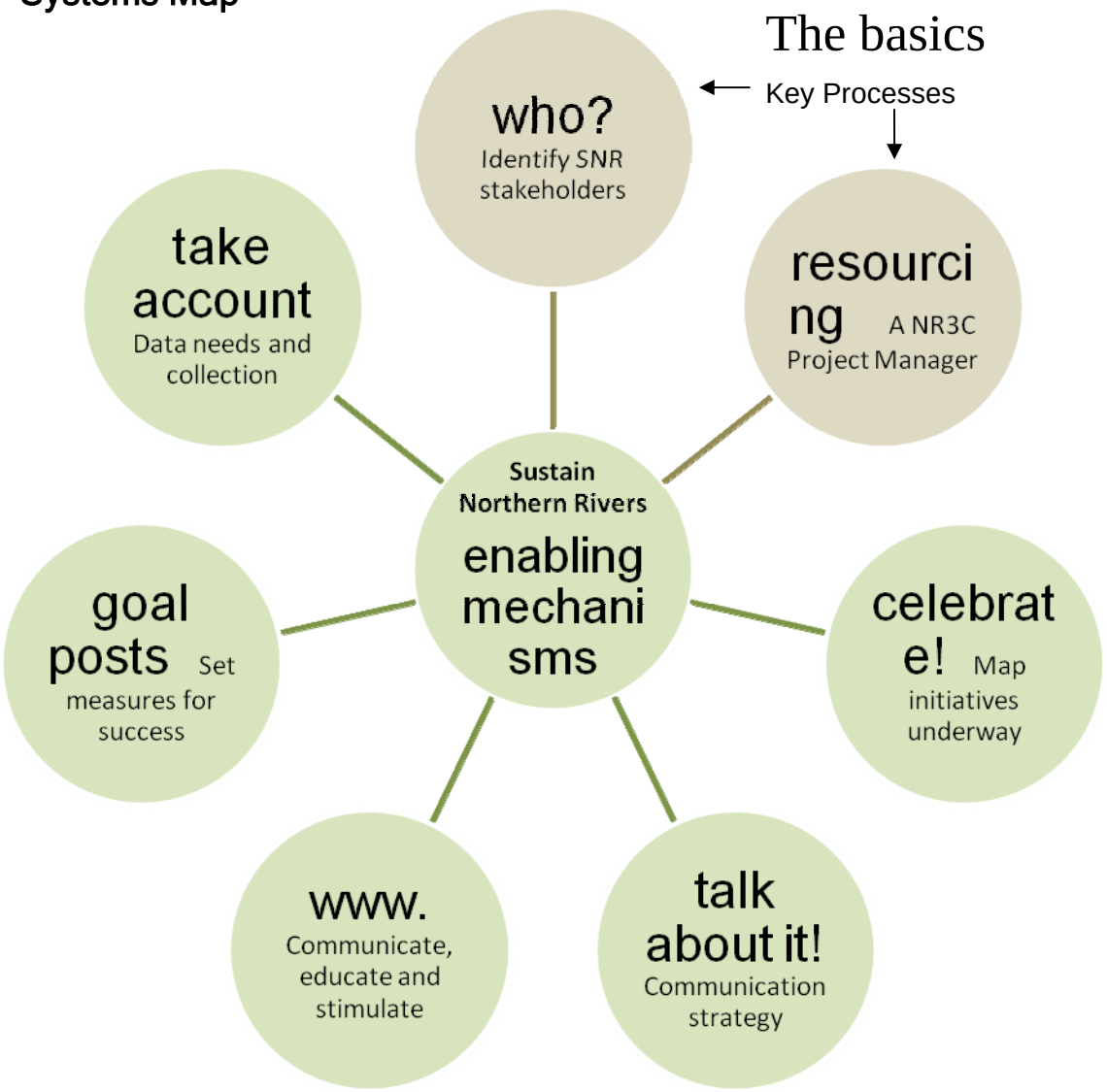
Goal

To provide the mechanisms that support, communicate and promote the initiatives and achievements of the Northern Rivers Climate Change Collaboration. The enabling activities will form the basis of the Sustain Northern Rivers Campaign.

Action Plan

The attached Action Plan identifies the Key Processes and Action Areas that will serve to meet the above goal. As the majority of these enabling actions serve as support structures NR3C, you will note that the entire NR3C is identified with some responsibility. The enabling project team will coordinate the progress of actions and bring in-line relevant partners from within NR3C and the broader region to ensure outcomes are achieved.

Systems Map



1. THE BASICS – Key Processes					
Actions	**Cynefin Framework Category**	**Timelines**	**Partners**	**Resource Implications**	**KPI's / Accountabilities**
a. Identify SNR stakeholders	Complicated	May to July 2009	All NR3C signatories and associates	In-kind time	Stakeholder matrix developed
b. Identify and apply for appropriate funding for NR3C Project Manager	Simple	As funding opportunities arise	All NR3C signatories and associates	1,2 or 3 year appointment	Funding secured Project Manager appointed

2. CELEBRATE! – Map Initiatives Underway					
Actions	**Cynefin Framework Category**	**Timelines**	**Partners**	**Resource Implications**	**KPI's / Accountabilities**
a. Define parameters – what do we need to map?	Complicated	May 2009	All NR3C signatories and associates	In-kind time Enabling team	Common understanding of breadth and depth of information required
b. Collate initiatives identified at NR3C March workshop	Simple	March to July 2009	Enabling Team	In-kind time Enabling team	List of initiatives wth supporting information
c. Develop mechanisms, including survey to capture initiatives not already known	Simple	May to July 2009	Enabling Team	In-kind time Survey platform	Mechanism and tools developed
d. Distribute survey through email lists	Simple	July 2009	All NR3C signatories and associates	In-kind time Enabling team	Survey distributed
e. Collate survey responses	Simple	August to September 2009	Enabling Team	In-kind time Enabling team	Complete list if initiatives with supporting information
f. Communicate and promote	Simple	Ongoing	Enabling Team	In-kind time Enabling team	NR3C initiatives promoted on SNR website

3. TALK ABOUT IT – Develop a Communication Strategy					
Actions	**Cynefin Framework Category**	**Timelines**	**Partners**	**Resource Implications**	**KPI's / Accountabilities**
a. Use stakeholder identification process to inform development of a communication strategy	Complicated	Undetermined - Hesitant to delay action for want of developing strategy	All NR3C signatories and associates	In-kind time	Communication strategy developed
b. Determine the viability/content of the Sustain Northern Rivers Campaign	Complicated	May to June 2009	NR3C Lean Design Team with consultation	In-kind time	Strategy for SNR campaign developed
c. Develop NR3C consultation process	Complex	May to June 2009	All NR3C signatories and associates	In-kind time	Consultation strategy developed

4. WWW. – Consolidate Sustain Northern Rivers Website					
Actions	**Cynefin Framework Category**	**Timelines**	**Partners**	**Resource Implications**	**KPI's / Accountabilities**
a. Evaluate existing website fit for purpose	Simple	Immediate	NR3C LDT and Enabling Team	In-kind time	Evaluation complete
b. Develop website outline. Plan proposed content	Complicated	May to June 2009	NR3C LDT and Enabling Team	In-kind time	Web content map developed
c. Identify functional requirements of website	Complicated	May to June 2009	NR3C LDT and Enabling Team	In-kind time	Needs map developed
d. Identify appropriate platform to support functions and growth	Complicated	July 2009	Orgs with IT/wed expertise	In-kind time	Web platform identified
e. Establish website and populate	Complicated	August to December 2009	All NR3C signatories and associates	TBA	Website online and populated
f. Establish and maintain responsibility for website maintenance and management	Complex	Ongoing	All NR3C signatories and associates	To be identified	Identified roles for web maintenance Guidelines and protocols for publishing on website established

5. GOAL POSTS – Set measures for success					
Actions	**Cynefin Framework Category**	**Timelines**	**Partners**	**Resource Implications**	**KPI's / Accountabilities**
a. Each NR3C priority area to identify outcomes and develop supporting measures	Complicated	May to December 2009	NR3C Priority Area Teams	In-kind time from priority area teams	Outcomes and measures developed
b. Priority area teams to communicate measures	Simple	October to December 2009	NR3C Priority Area Teams	In-kind time from priority area teams	Outcomes and measures communicated to NR3C and on SNR website
c. Develop strategy to report progress towards goal posts	Simple	Commence January 2010	NR3C Priority Area Teams	In-kind time from priority area teams	Outcomes and measures are reported against

6. TAKE ACCOUNT – Date needs and collection					
Actions	**Cynefin Framework Category**	**Timelines**	**Partners**	**Resource Implications**	**KPI's / Accountabilities**
a. Identify data currently held within NR3CA	Complicated	May to December 2009	All NR3C signatories and associates	In-kind time	NR3C data map
b. Identify data currently held in region outside NR3C	Complicated	May to December 2009	SNR stakeholders	Project time	Regional data map
c. Consolidate data collected and communicate via www.	Complicated	January to March 2009		Project time	Data on SNR website
d. Identify gaps for further date collection	Complicated	January to March 2009	All NR3C signatories and associates	Project time	Gap analysis complete

The Sustain Northern Rivers Food Resilience Plan

Version .01

Project Leader: Annie Kia
Team members: Ken McLeod, Geoff Baldry, Simon Clough

Rationale

All Northern Rivers councils are involved in a major project to localize the NR food supply to 'future proof' NR communities against the impacts of climate change and peak oil. Several NR3C member organizations participated in development of the successful Environment Trust grant application for $2.2 m over 3 years. This project will have a Business Plan by September 2009, and will become the major food project in the region. The NR3C Food Resilience Plan reflects this important part of the Northern Rivers sustainability project landscape. Evaluation strategies also need to be developed in the context of this major regional food initiative.

Food Resilience Goals

To increase the food resilience of Northern Rivers Communities by

- Increase local food production for local consumption
- Increase uptake of sustainable food production methods

Resource Efficiency Action Plan

STAGE 1

Stage 1 focus is to map existing projects, barriers and potential strategies:

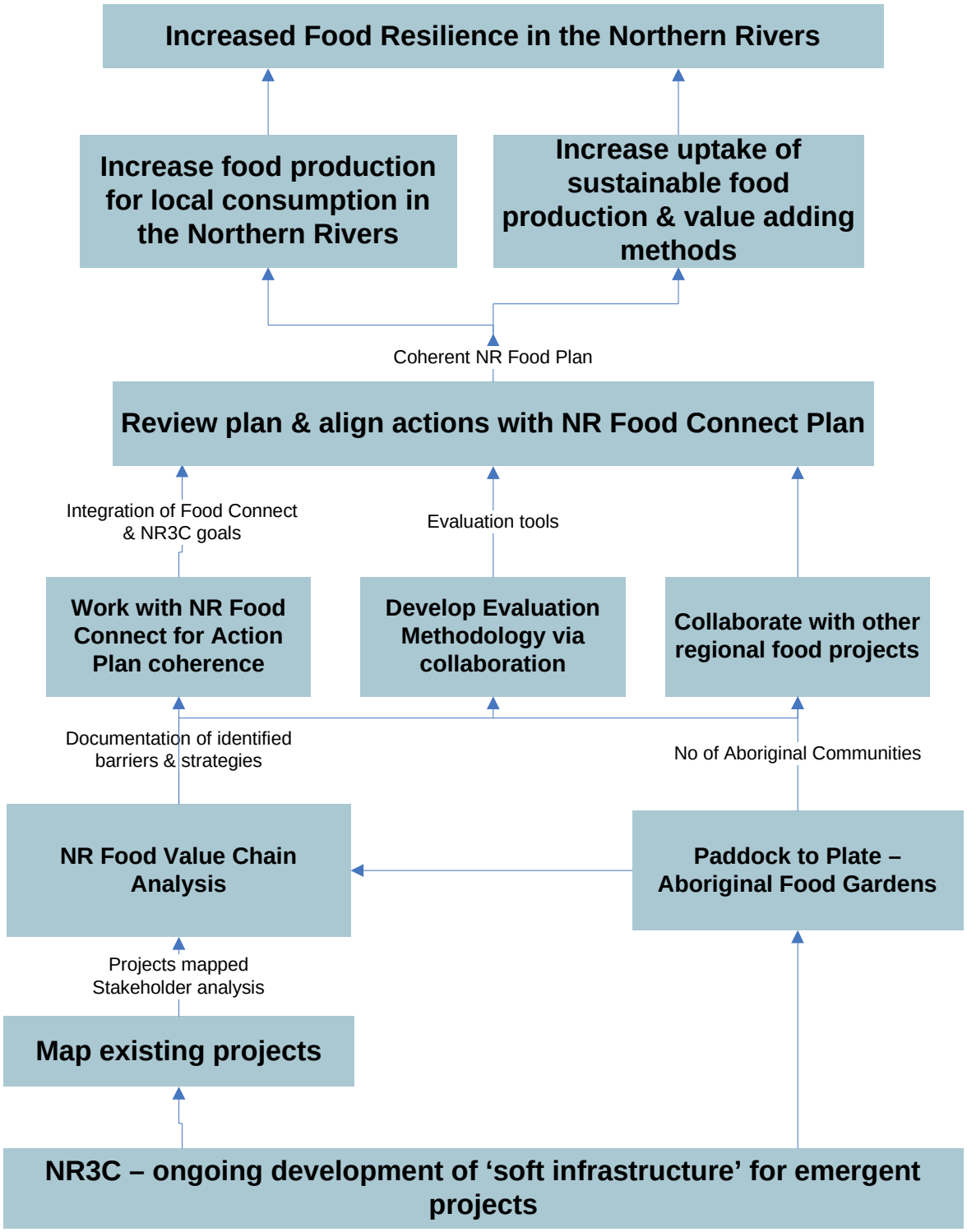
6. Map existing projects and conduct an analysis of the food value chain in the Northern Rivers
7. Support the development of the Aboriginal Food Gardens project – Paddock to Plate

STAGE 2

Work with the NR Food Connect Facilitator and Steering Committee to develop an integrated approach to regional food resilience.

Develop evaluation methodology
Collaborate with other food projects within the region
Review gaps, align NR3C with NR Food Connect Plan

Food Resilience Logic Map



5. Map existing projects and analyse the food value chain					
Actions	**Cynefin Framework Category**	**Timelines**	**Partners**	**Resource Implications**	**KPIs Accountabilities /KPIs**
e. Map existing projects	Simple	May 2009	Wollumbin NCAHS	In-kind time NCAHS Resilience funding	Documentation of projects
f. Conduct NR Food Value Chain Analysis	Complicated (Sense & analyse - strategies are emergent)	May – June 2009	Wollumbin NCAHS NR Food Connect	In-kind time NCAHS Resilience funding	Documentation of barriers and potential strategies
g. Support development of the Paddock to Plate Aboriginal Food Gardens project	Complicated (Sense, analyse, respond to needs of communities)	May➔	TAFE Aboriginal Land Councils Aboriginal Communities NCAHS DPI	In-kind time Funding to be sought	Number of participating communities Paddock to Plate Action Plan Evaluation Strategies

6. Work with NR Food Connect to develop an integrated approach to food resilience in the Northern Rivers					
Actions	**Cynefin Framework Category**	**Timelines**	**Partners**	**Resource Implications**	**KPIs Accountabilities /KPIs**
d. Work with the Facilitator and Steering Committee of the NR Food Connect project for alignment of food objectives	Complex (Unknown zone – need to probe & respond in order to align objectives)	May – Sept 2009	NR Food Connect Local Councils SCU TAFE NRSDC DPI NCAHS	NR3C in-kind time NR Food Connect grant	Alignment referenced in Food Connect and NR3C plans
e. Develop evaluation methodology	Complicated	May – Sept 2009	As above	NR3C in-kind time NR Food Connect grant	Qualitative and Qualitative methods developed
f. Collaborate with other regional projects:	Complex (probe to explore potential to facilitate an integrated approach to food)	May – Sept 2009	NR Food Connect	NR3C in-kind time	Integration reflected in plans

Appendix: Comparison of NR3C and NR Food Connect

NR3C Food Resilience Scoping (from the NR3C Workshop)	NR Food Connect (from EOI Package)
AIM Build Food Resilience in the Northern Rivers GOALS Increase NR food production for local consumption Increase rewards for food producers Enable the sharing of economic risks entailed in food production Rebuild the regional food economy Encourage uptake of sustainable food production methods Create points of entry for young people into the industry Integrate NR Food Resilience with the NR Food Connect project and with other food initiatives Integrate with Aboriginal Food Gardens project Explore options for identification of Northern Rivers Food (branding) Explore options for value-adding (this also deals with surpluses) Increase household and community food production Negotiate with large retailers to reduce food miles Increase workforce skills in: Sustainable farming and NRM practices Food quality and safety standards Managing for resilience Increase community skills in: Backyard and community food production Using surplus F&V in cooking and value-adding Increase consumer behaviour to make sustainable food choices. STRATEGIES Map existing projects Create an ongoing NR Food Net forum for information exchange Establish base data needs Food growing capacity in the region Current producers Consumer market differentiation (demographics) Consumer behaviour (Jerry Vanclay's study) Conduct Food Value Chain (FVC) analysis in Tweed, Richmond and Clarence valleys to identify weaknesses in the FVC, and strategies, and build FVC partnerships Assess skill development needs of producers Explore options for: Buyer consortiums - they replicate advantages of the current system Community Supported Agriculture Enable the emergence of local food networks and distribution systems by aggregating demand Communicate the NR Food Resilience Plan to the Northern Rivers Develop social marketing strategies re healthy food behaviours and reducing waste	1. Food system audit. 2. Assessment of greenhouse emissions. 3. Model economic impact of local vs global food production on local families. 4. Training for council staff and Councillors. 5. Development and implementation of Council planning instrument. 6. Equip Local Government with information resources. 7. Community consultation and education. 8. Identify networks to sell and trade in local food. 9. Build leadership and collaboration in the local fresh food industry. 10. Establish a local food distribution system. 11. Linking local producers and consumers. 12. Establish a range of community food retail options. 13. Education campaign to increase social connectedness within urban centres. 14. Increase community food literacy. 15. Online NR local food website. 16. Support, develop and produce guidelines for urban agriculture. 17. Identify barriers to organic waste reuse. 18. Audit of on-farm compositing. 19. Organic Reuse marketing initiative. 20. Development of skills in sustainable urban agricultural systems. 21. Complete preliminary research of the barriers to the broader set of sustainability issues. 22. Identify or propose possible models for addressing ongoing regional sustainability management and administration. 23. Survey community and industry. 24. Market studies. Project will be coordinated by an executive committee group consisting of all partners with reference to advisory specialist.

Appendix 4: Branding and communicating SNR

SNR in Brief

Sustain Northern Rivers

Northern Rivers Climate Change Collaboration

How did it start?

In 2008, representatives of peak regional organisations met to explore how to help our region make the economic and social transition to deal effectively with climate change. In June they drafted a *Northern Rivers Climate Change Collaboration Agreement*. It was decided to call the process of engaging action ***Sustain Northern Rivers***.

What is the Northern Rivers Climate Change Collaboration Agreement?

It is a simple, non-binding agreement through which organisations agree to communicate, consult and collaborate, and to engage the community in action on climate change.

Which organisations are involved?

Northern Rivers Climate Change Collaboration evolves as it grows. Current participants are Byron Shire Council; Catchment Management Authority; Local Community Services Association; North Coast Area Health Service; North Coast Institute of TAFE; Northern Rivers Social Development Council; Northern Rivers Tourism; Northern Star Pty Ltd; NSW Department of Education & Training; Southern Cross University; Richmond Valley Council; North East Waste Forum; and Youth Environment Society.

What are the goals of *Sustain Northern Rivers (SNR)?*

There are action plans for four priority areas: USE ~ sustain our resources; EAT ~ build food resilience; MOVE ~ get going on transport; and SHARE ~ accelerate the change. ***SNR*** acknowledges and seeks to enhance the creative and varied sustainability endeavours across the region. The intention is to use the regional ***SNR*** goals to mobilise self-organised action in communities and industry sectors; to publicise via media partnerships; and to enable project-based co-operation between organisations.

USE

To empower and enable the Northern Rivers community to reduce the region's ecological footprint (energy, water, waste). Some key initiatives:

- Northern Rivers Sustainability Advantage cluster
- Regional data on household footprints
- Identify alternative supply options
- Household Sustainability Assessments

MOVE

To increase transport options for the Northern Rivers, reduce transport emissions, increase physical activity, social capital and resilience. Current focus:

- Northern Rivers Travel to Work & Study Survey
- Reports to all 10 participating employers
- Aggregate data and develop micro-strategies based on commuting patterns in towns across the Northern Rivers

EAT

To increase local food production for local consumption, and increase uptake of sustainable food production methods. Initiatives include:

- Food Value Chain Analysis via phone and online poll
- Food Resilience Roundtable to identify barriers & generate project concepts for self-organised action
- Work with the emerging Food Links project to develop strategy areas

SHARE

To provide mechanisms that support, communicate and promote the initiatives and achievements of SNR. Some key strategies are:

- Seek resources for website development
- Map initiatives underway
- Communicate, educate, stimulate
- Set measures for success

September 2009

The SNR Spring Update

The SNR update

Spring 2009

Sustain Northern Rivers is our joint mission to accelerate the change to sustainability for our region. Some strategies are underway, while others will be initiated when resourcing of SNR is settled. Currently SNR is supported by the in-kind contributions of participating organisations. We are seeking resources to build our website as the means of communicating.

The SNR priority areas are:
Move ~ get going on transport
Use ~ sustain our resources & energy
Eat ~ build food resilience
Share ~ accelerate the change

The Michael Shuman Forum

40 people participated in this SNR Forum at Southern Cross University in June on how business can grow local living economies as we respond to climate change. The purpose was to enable people from industry groups to explore ideas for self-organising initiatives. Michael Shuman, respected economist, author, and entrepreneur presented compelling evidence for building vibrant local economies through locally connected and supportive enterprises. Industry-themed groups had Q & A sessions with Michael Shuman, and workshopped *what's happening now*, *what needs to happen*, and *best bets*.

Food Resilience Roundtable

SNR partners NCAHS Health Promotion and North Coast Institute of TAFE sponsored a Food Resilience Roundtable 27th July 2009 which followed analysis of the food value chain via phone and online surveys. The goal was to identify barriers preventing local food production for local consumption, and to generate ideas for action. The forum also enabled representatives from regional food initiatives to develop ideas together and engage with 50 participants from every part of the food value chain. Several project ideas, including some exciting private enterprise concepts, were developed. To maximise outcomes for the region, further development of SNR Food Resilience strategies will await the details of the exciting Northern Rivers Food Links project auspiced by Northern Rivers councils.

SNR is an initiative of the Northern Rivers Climate Change Collaboration (NR3C) - current participants are

Byron Shire Council; Catchment Management Authority; Local Community Services Association; North Coast Area Health Service; North Coast Institute of TAFE; Northern Rivers Social Development Council; Northern Rivers Tourism; Northern Star Pty Ltd; NSW Department of Education & Training; Southern Cross University; Richmond Valley Council; North East Waste Forum; and Youth Environment Society.

Mapping travel in the region

In July-August the *SNR Transport Options* group conducted an online travel survey based on the NCAHS travel study which enables us to aggregate data on the commuting patterns of students and staff at SCU, TAFE, all seven Northern Rivers local governments and the Social Development Council. When combined with the NCAHS data, this will enable us to develop strategies to liaise with transport providers; streamline services to meet local needs; as well as provide organisations with information about what they can do to encourage people to cycle or walk to work or study. Regional areas lack data on transport patterns. Through our collaboration, we've been able to develop this innovative approach to data pooling.

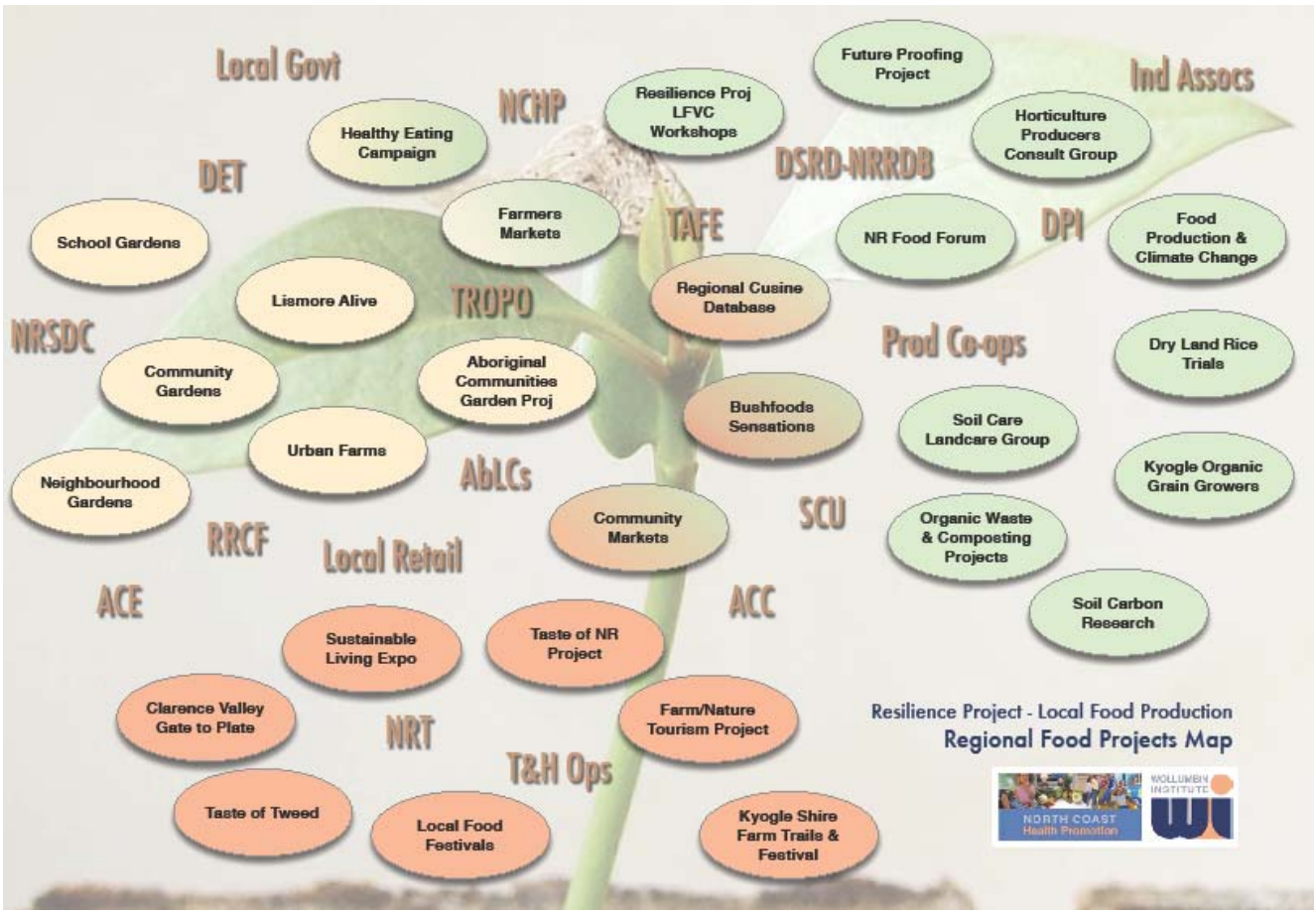
Sustainability Advantage

Regional businesses are discovering they can tackle environmental issues, enjoy cost savings and improve performance at the same time. They've formed a cluster to get systematic support from the Sustainability Advantage program (NSW DECC). The group is supported locally by Regional Development Australia – Northern Rivers (which takes up this project from the Northern Rivers Regional Development Board). The cluster includes Brookfarm, Byron Bay Cookie Co, Cawarra Cosmetics, Feros Care, Lismore City Council, Lismore Workers Club, Norco, North Coast Institute of TAFE, NSW Sugar, Rochdale Accounting, Southern Cross University, Summerland Credit Union, St Andrews Aged Care and Westpac Life Saver Rescue Helicopter. The supportive development process covers benchmarking; managing energy, materials, water & waste; greening the office, and staff awareness.

Sustainability Advantage Cluster meeting Dec 2008

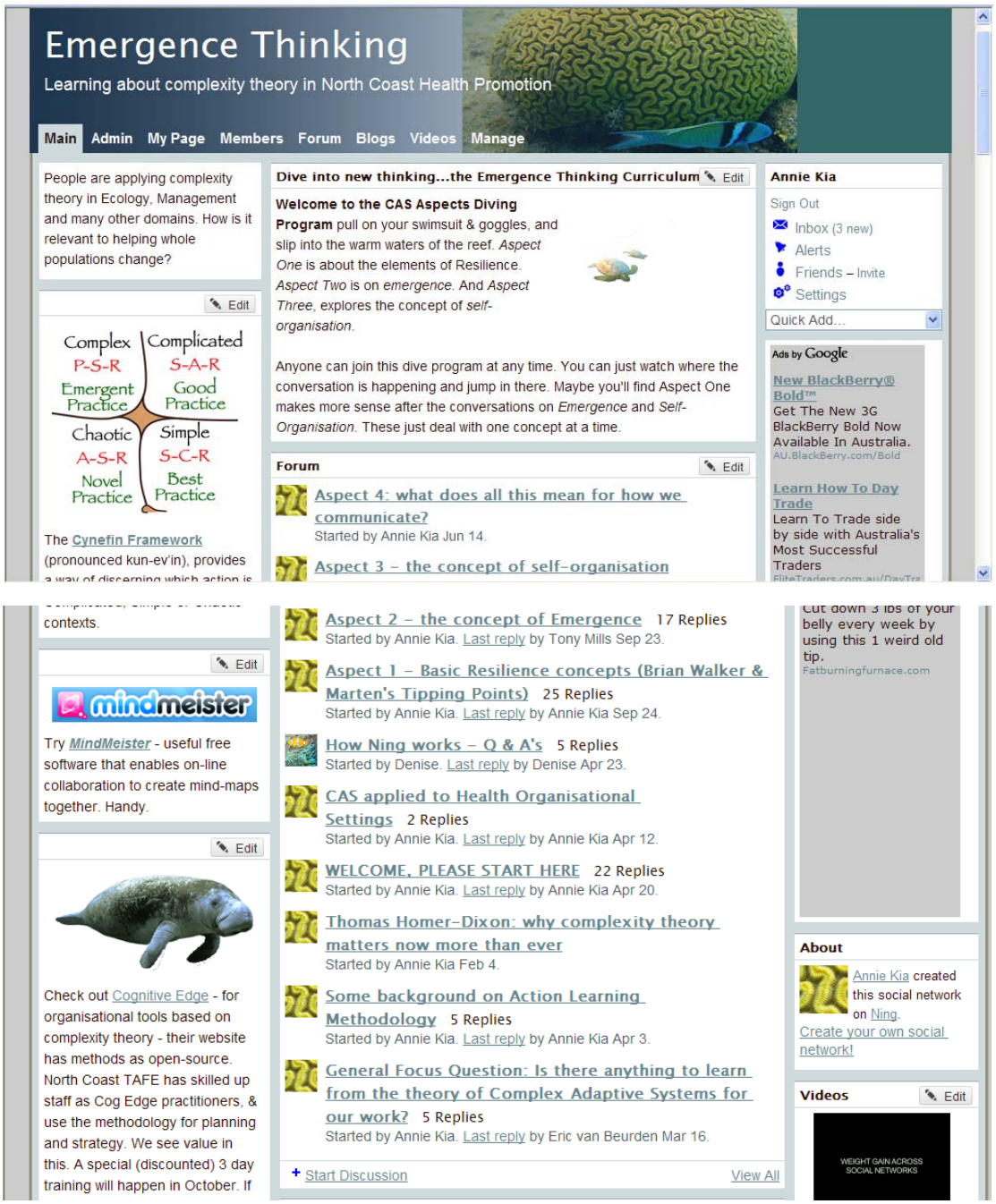
The Northern Rivers Climate Change Collaboration is evolving. For further information go to www.sustainnortherrivers.org

Appendix 5: Mapping regional food initiatives prior to analysis of the food value chain

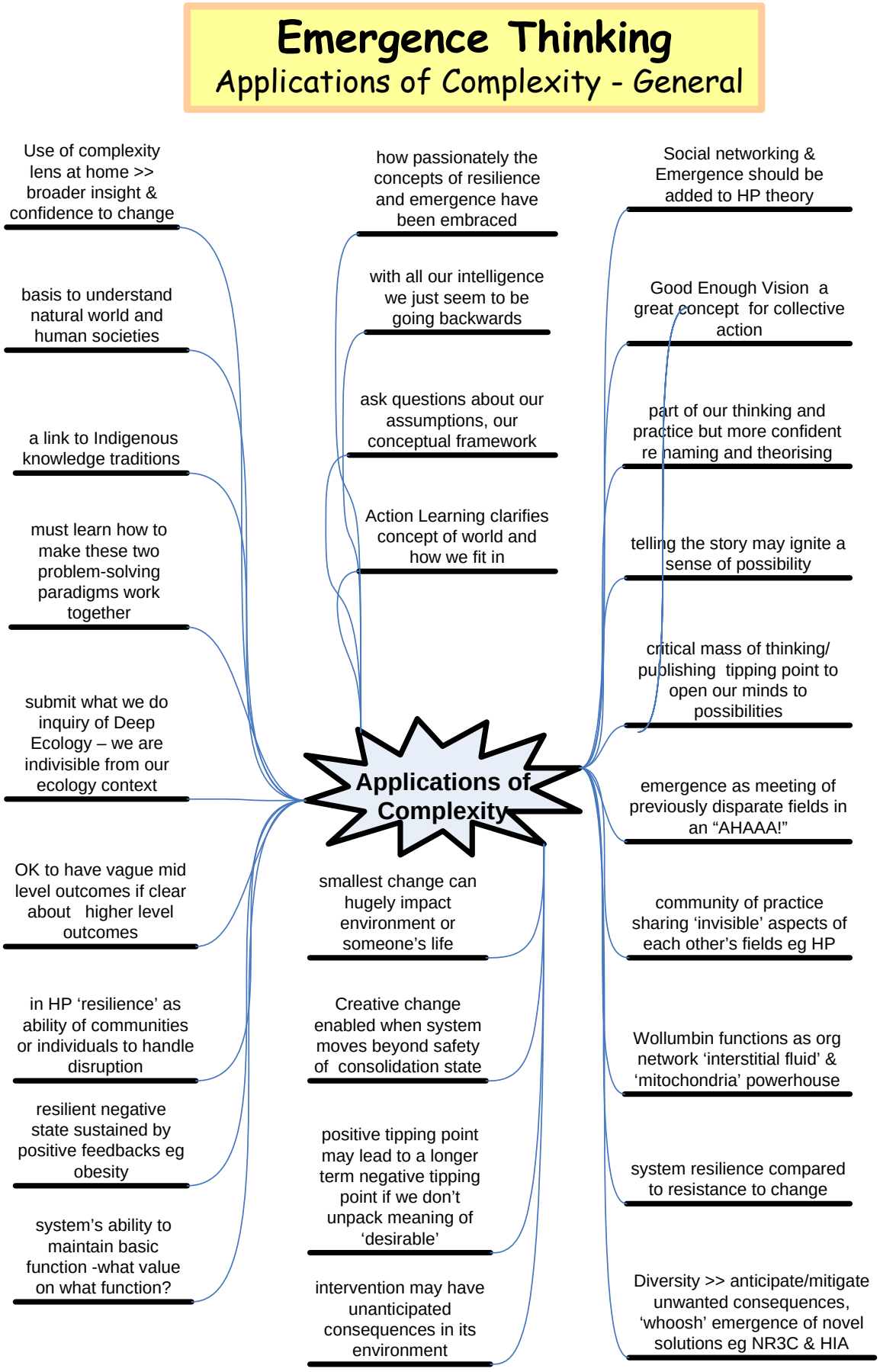
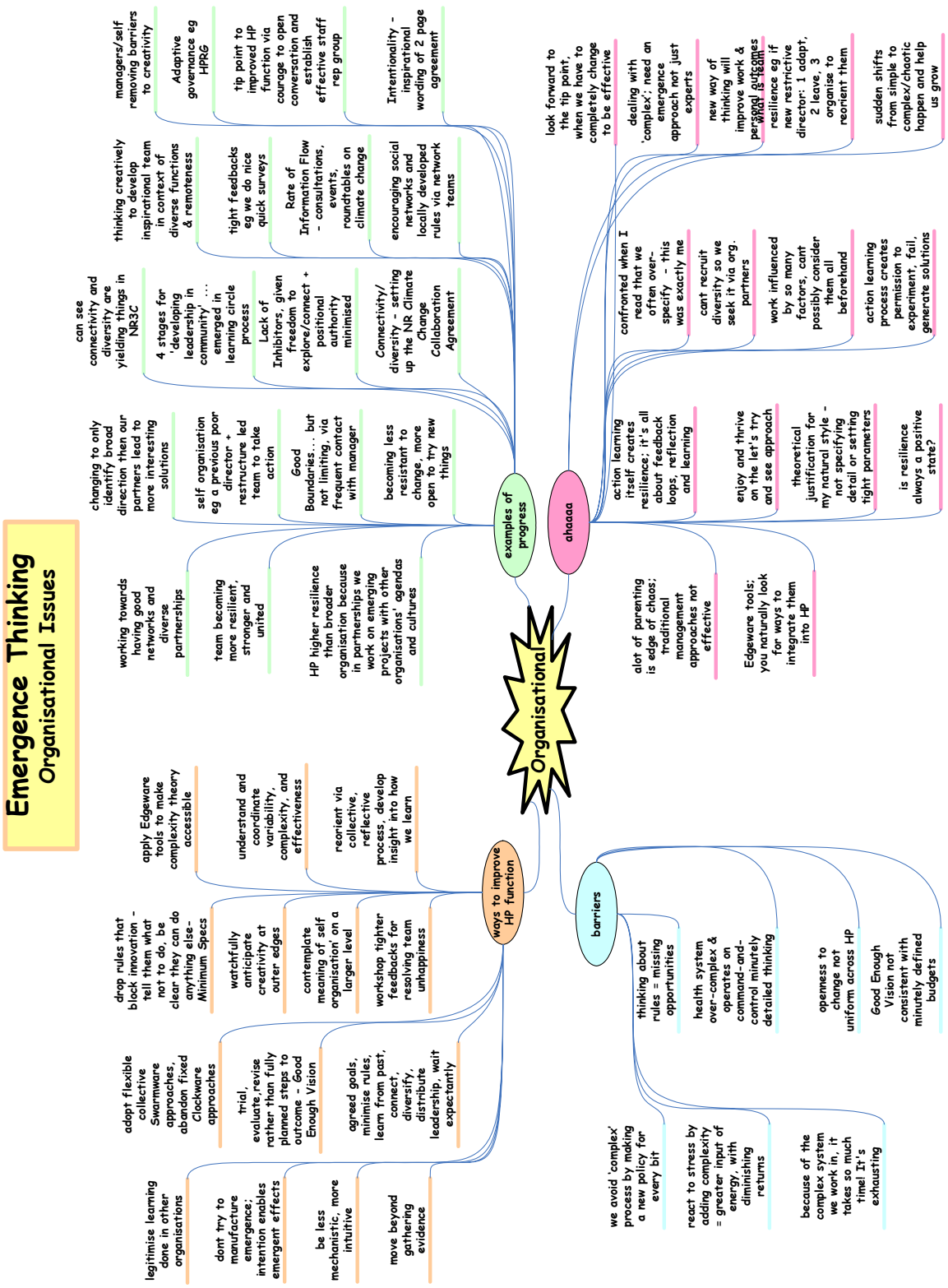


Appendix 6: Samples from *Emergence Thinking*

Home page of Emergence Thinking networking site



Summation of exploration of how complexity could be applied



Summation of discussion on organisational issues