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Resilience
Enhancing rural local government capacity in natural resource management

Resilience: Enhancing Australian Rural Local Government Capacity for Natural Resource Management

The Inside Information, Land and Water Australia, Research Project Number ANU43 of the Social and Institutional Research Program.

By Su Wild River

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Campaspe Shire Council

Carnarvon Shire Council

Central Highlands Council

Coomalie Shire Council

Gascoyne Development Commission

Goulburne-Broken Catchment Management Authority

Greater Shepparton City Council

Gundagai Shire Council

Gwydir Shire Council

Katherine Town Council

Landcare Katherine

Landcare South Australia

Loddon Shire Council

Meander Valley Council

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Morowa Shire Council

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Northern Midlands Council

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Executive summary

Background

Resilience is a 'Land & Water Australia' project aiming to enhance local government (LG) capacity in Natural Resource Management (NRM). Its focus is on improving the understanding that different spheres of government have of one another generally, and of LG NRM efforts in particular. The primary purpose of these reports is to provide insights to state and national agencies about local and regional perspectives on NRM issues and initiatives. The Inside-out reports are produced in both printed and electronic formats. The electronic versions include links to thousands of quotes taken from interviews with NRM practitioners, making this research transparent and accessible to readers.

Resilience is working with 28 local governments (LGs) – four from each state – and the regional organisations they work with on NRM issues. All participating LGs face serious, multiple NRM challenges. They have mixed levels of prior engagement in regional, state and national NRM initiatives. The findings from 52 in-depth interviews conducted during 2004 and 2005 with 79 officials from participating LGs and other agencies are reported here.

A short brochure gives further background to the overall project. A methodology report gives details on the approach and analytical frameworks that were applied in the research. In brief, the research used grounded theory and action research methods provide the analytical framework for the inside-out reports. The core methodological strategies have been to:

- induce analytical categories that explain local experiences of NRM;
- define those categories;
- describe the relationships between them; and
- actively enhance NRM by exchanging information about what was learned.

This research has added more weight to the grounded theory that inspired it. That theory highlights contradictions between state and LG perceptions of LG roles as a basis of many problems operating between the spheres. LGs think, act and work as creatures of the local, while state governments operate as if LGs are creatures and servants of the state (see analytical themes report). These entrenched misunderstandings impede cooperation for NRM between spheres. NRM improvements therefore require novel ways for learning, communicating and shifting the core values of each sphere. This research applies action research methods to meet these needs.

To assist LG learning, the research started by assembling an *Outside Information* kit, which tested some new approaches for delivering information about broad-scale NRM information to LGs. These were hand delivered and discussed with LGs during the delivery of an open-ended survey. LGs appreciated the tailored, applied, simple approach take in these reports that was connected to in-depth technical details (see report on responses to *Outside Information*).

Survey questions asked respondents what they considered to be the most important local environmental problems. Challenges related to human settlements were mentioned most often, with a focus on knowledge and institutions, land use and tenure, sustainable agriculture, pollution and

waste, finance and indigenous issues. Biodiversity and water problems also rated very highly, with problems like invasive species, loss of native species and water quality issues predominating. Problems with soil – especially dryland salinity and erosion also featured in many interviews. Climate and coastal issues were described more rarely (see report on the most important local environmental problems).

The survey also asked respondents to describe how they learn about the most important local environmental problems. Face-to-face information exchange was the most common, and one of the most effective ways that practitioners are learning about local environmental issues. They are also learning through plans, strategies policies, reports and technical information. Although these were reported as less effective generally than was face-to-face information exchange, the single best piece of NRM information that respondents had received was most often from these formal sources. Other important ways that practitioners are learning about important local environmental problems are through their own observations, newsletters and regular updates and the internet (see report on learning about environmental challenges).

Some generic NRM issues were explored using a gap analysis survey technique. This quantifies the gap between the importance and effectiveness of initiatives. Reports on resources, coordination, consistency, and the potential for local contributions to regional and national databases are the result. The largest gap – and therefore the biggest problems were based around the severe resource constraints faced by LGs. Insufficient money to do essential NRM work was the single biggest problem, but there were also shortfalls in other types of resources – such as statutory capacity, people, knowledge and time. Coordination between spheres of government can be explained in relation to clear responsibilities, connections and commitment. Consistency between local and broader plans involves recognition of environmental features, institutional frameworks and resources. Local contributions to regional and national databases would be enhanced by addressing gaps in capability, engagement, knowledge and data access. Reporting covers each of these substantive issues, as well as discussing whether they were mentioned as drivers or constraints to enhanced NRM, and whether those forces are operating within or between spheres.

Another report focuses on a problem that was discussed frequently and passionately by respondents. This is the spread of weeds throughout agricultural and natural landscapes, and the challenges it poses to LGs (see weeds report). The results show that current controls are largely ineffective in halting the spread of weeds. The strongest forces currently being applied are knowledge, initiatives and work. Other important weed controls which are largely ineffective in their current forms are formal roles, money, connections between agencies and commitment.

The research explored the outcomes from Australia's attempts to organise NRM efforts within regional boundaries that are often focused on water courses and catchments. This report highlighted the specific initiatives being applied, and whether they were considered as effective. Most were considered to be ineffectively applied at present, although knowledge and people were usually effective forces for regional organisation.

One of the reports focuses on the foundations of resilient communities. The findings there suggest that the capacity for community resilience is driven by leadership, knowledge, people, environmental features, diversity, development, cooperative efforts, commitment and money. The contribution of each of these features varies by the location of communities and individual perspectives. Their

effectiveness is also variable, with leadership, people, environmental features and cooperative efforts most often reported as being effective.

The final report address the question of engagement – how to define it, and how broader spheres might help to increase it. The findings include a working definition for engagement. Results suggest that engagement is built up over time, through good resourcing, strong relationships and the reinforcement of positive experiences. Engagement is not achieved through short-term, disconnected ideas that are imposed by outsiders on local areas.

As a total set, the reports provide insights to enhance Australia's rural LG capacity in NRM. The next steps in this research process are to carry the findings forward to state, territory and Australian agencies involved with LGs on NRM initiatives.

https://wild-river.com.au/wp-content/uploads/2014/03/how_to_fact_sheet.pdf

Chapter 1: Resilience methodology report

Resilience inside-out report 1

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Executive summary

The Resilience methodology report underpins all of the other Inside-Out reports in this set. Together, the reports present findings from a national study into local and regional perceptions of and engagement with Natural Resource Management (NRM). This report explains the methodological basis for the findings that are presented in the other reports. It covers the:

- sampling strategies and resulting sample of local governments (LGs) and regional agencies that participated in the research;
- grounded theory and action research methods that are the analytical foundations of the research. It justifies and explains their use in this research;
- combination of qualitative and quantitative data analysis used;
- specific research technique of gap analysis that was applied in the data capture and analysis for five of the reports;
- remainder of the *Resilience* survey – its contents, how it was developed, applied, and how results were recorded;
- specific approach that was taken to inducing analytical categories that are a key product of this research; and
- the next steps that are planned for this research.

Background to the methodology report

Resilience is a Land & Water Australia project aiming to enhance local government capacity in Natural Resource Management (NRM). Its focus is on enhancing the understanding that different spheres of government have of one another generally, and of NRM efforts in particular. *Resilience* is working with 28 local governments – four from each state. All participating LGs face serious, multiple NRM challenges, and have mixed levels of prior engagement in regional, state and national NRM initiatives.

The inside-out reports present results from 52 in-depth interviews conducted during 2004 and 2005 with 79 officials from the participating LGs and the NRM agencies that they work with on NRM issues. The primary purpose of these reports is to give insights to state and national agencies about local and regional practitioner perspectives on NRM issues and initiatives.

LG perspectives are poorly understood outside of LG circles. There have been relatively few studies of Australian LG contributions to environmental issues, despite the importance of this smallest sphere – as is suggested in the following quote.

> "LG is the poorest of the three spheres, with less then six per cent of the total expenditure. However at $4.1 billion in 2002-3, LG environmental expenditure accounted for more than half of total environmental spending across Australia's three spheres of government. Environmental work accounts for more than a quarter of LGs total annual expenditure, but only six per cent of state government, and one per cent of Australian government spending" (Wild River 2006. Data from ABS 2004a, p.38; ABS 2004b pp.5, 9, 12, 16 – see references).

The methods adopted for this study differ from the relatively few previous studies of LG in some important ways. *Resilience:*

- adopts a rare 'inside-out' approach, seeking to understand LG from LG perspectives, rather than through analysis of state government legislation or broad policy frameworks;
- does not focus on LG leaders, which are the comparatively rich, compact and populous minority among LGs, and also those that are best able to lead, benefit from and promote their environmental successes. The LGs that contributed to this study are typically extensive, sparsely populated and poor, and the environmental work of half of the sample is not generally recognised;
- investigates two politically sensitive issues – the significant NRM problems faced by some LGs and the varying levels of engagement that they have had with state and national NRM programs;
- is a national study, involving four local governments from each Australian state and the Northern Territory;
- includes indigenous LGs, which make up over 10 per cent of Australia's LGs; and
- has adopted a rigorous, systematic approach to selecting LGs to participate in the project, ensuring that all of the above research goals could be met.

Because LG studies are rare, and this one differs from the others in so many ways, it is reasonable to expect novel findings from *Resilience*. For these reasons, the analytical approach selected for this study is the discovery of grounded theory. This Resilience Methodology Report details the use of grounded theory methods in this study, and the specific techniques that were used in producing the set of inside-out reports of which this is a part. This research also aims to help improve rural Australian LG NRM capacity. Hence, it calls for the application of action research methodologies.

This report starts with a discussion on the *Resilience* sample, demonstrating that a good spread of interviewees was achieved across six key explanatory variables that are used in analysing results. Second, it briefly describes grounded theory and action research methods, justifies their application

and explains their use here. Third, this report discusses the combination of qualitative and quantitative data analysis used in the inside-out reports. This section focuses on the use of charts and tables to summarise findings about relationships between analytical categories that were induced from interview data. Fourth, it looks at the specific research technique of gap analysis that was applied in the data capture and analysis for five of the reports. The fifth section describes the remainder of the *Resilience* survey – its contents, how it was developed, applied, and how results were recorded. The sixth section explains the specific approach that was taken to inducing analytical categories that are a key product of this research, using N-Vivo qualitative data analysis software. The most significant analytical categories that have emerged, and relationships between them are discussed in a separate report on LG analytical themes. Finally, the report briefly describes the next steps that are planned for this research.

The *Resilience* Sample

This research has applied rigorous scientific principles and methods so that findings can reliably aid our understanding of the NRM challenges confronting Australia's rural LGs. One of these methods was a stratified sampling strategy ensuring that the individuals and agencies represented in this study allow for sound, scientific analysis of key research questions. The successful application of this strategy ensures that results can be confidently extrapolated beyond the sample.

This section first explains the features that were similar among the agencies included in the sample, and then focuses on differences between them. These were were built in to the sample because of their predicted ability to give new insights into Australia's NRM capacity.

Ways in which all sampled agencies are similar distinguish them from previous studies into Australian NRM policy and its implementation, which tend to focus on Australian or State agencies, or on rich, compact, urban LGs. In contrast to these studies, all of the agencies included in the *Resilience* sample are:

- within districts facing serious, multiple NRM challenges; and
- rural.

The identification of LGs that faced serious, multiple NRM challenges was an extensive comprehensive analytical task that also underpinned the development of an Outside Information Kit which was supplied to all participating agencies. That process involved:

- selecting a set of maps that were produced by the National Land and Resources Audit, that showed the geographic extent of NRM challenges of interest to LGs;
- overlaying those maps on LG boundaries;
- rating the results to produce a national map showing which LGs faced the most serious, multiple NRM problems; and
- selecting neighboring pairs of LGs that faced similar NRM problems, but had different levels of engagement wiith NRM programs (see below for selecting for engagement).

The results of this research are detailed in the Resilience report on responses to the Outside Information, and also an international journal article.

There are few reports about rural LGs because most studies focus on LG leaders, which are usually based in cities. These urban LGs and are comparatively rich, compact and populous. These LGs have both the capacity to get involved in environmental initiatives, and to report widely on their results (see for example Alexandra, Higgins and White 1998; ALGA 2005; ICLEI 2004; WALGA 2005; Wild River and others 2002). The easiest way to avoid a focus on LG leaders was to exclude urban LGs from the sample.

It was easy to identify Australia's rural LGs, and to sample from among them. The National Office of LG produces an annual report that identifies LGs according to whether they are urban, or rural. In 2003-04, 161 or 22 per cent of Australian LGs were classified as urban, and 560, or 78 per cent were classified as rural (DoTaRS 2005), p.3). The *Resilience* sample excluded urban LGs. Note that one of the 28 LGs included in the study, one is classified as a 'rural city'. This was from Victoria, where recent amalgamations have created relatively novel types of LGs, and this LG fitted the sample criteria in other ways, and was considered suitable for inclusion in this study – also allowing the possibility of seeing whether this new type of LG was like other rural councils.

The *Resilience* sample was stratified to include a balanced spread of agencies and individuals across six key variables that were predicted to explain differences in perceptions of NRM programs and their outcomes. Those variables are listed here, and explained below, together with details of the selection processes and graphs that show the balance that was achieved. The six variables were:

- agency type;
- level of engagement;
- state or territory;
- within or outside the Murray Darling Basin (MDB);
- roles within agencies; and
- perspectives of individuals.

Resilience focuses on LGs and the regional agencies that they work with on NRM issues.

Resilience was interested in both rural LG and regional NRM agency perspectives on Australia's contemporary NRM programs. Hence it needed to include regional agencies as well as LGs. Sampling first selected LGs, and then identified the relevant regional agencies that they work with. Those agencies were typically the regional NRM agencies that are currently responsible for developing regional NRM plans under the Natural Heritage Trust. Many of those agencies originated as Catchment Management Authorities, or have historical links to other regional NRM bodies. Some were regional offices of state government NRM or environment departments. The sampling target was to include at least one regional NRM agency for each neighbouring pair of LGs that were selected. Figure 1 shows the spread of agencies that were represented in the final sample.

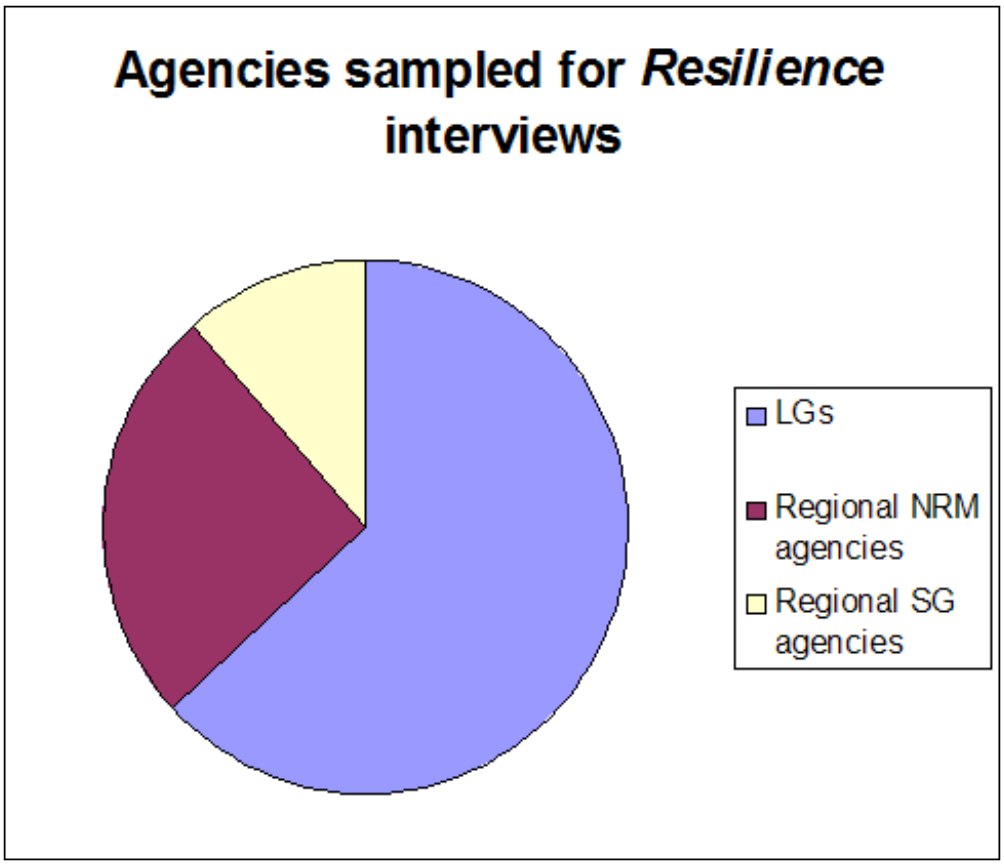

Figure 1 - agencies sampled for *Resilience* interviews

Engagement is a measure of how involved LGs are in broad-scale initiatives. It is discussed in detail in the analytical themes report.

There are no national, or even official registers of LGs by level of engagement. This is partly because engagement has not previously been formally defined (see the engagement report). It is also because it is politically contentious to identify a LG as having a low-level of engagement. *Resilience* solved this problem by working with LG Associations, which represent LGs in each Australian state and Territory, as well as at a national level. LG Associations are funded by the Australian Government to employ LG NRM Facilitators, who were included on the *Resilience* Reference Group. These professionals have excellent, up-to-date insights about LG involvement in NRM programs. Neighboring pairs of engaged and less engaged LGs were selected by the LG NRM facilitators, from the short list of LGs that had already been identified as facing serious, multiple NRM challenges.

For thoroughness, and to work towards a formal definition for engagement, the LG NRM Facilitators' determination of engagement had to be tested with LGs. Towards the end of interviews there was a question about how engaged the LGs considered that they were. All 12 LGs that were identified by LG Associations as being more engaged also considered themselves to be highly engaged in NRM programs. 11 of the 12 LGs that had been identified as having lower engagement agreed with this view. Engagement was contested in five cases. One was a LG that had been identified by a LG Association as less engaged, but officials there considered that they were more engaged. The level of engagement in the remainder had not been identified, and LG officials within them were unable to agree amongst themselves about a prior level of engagement. The level of engagement of this group was classified as 'contested' in the results. Engagement was considered 'not applicable' for NRM agencies, since they run NRM programs, and are therefore engaged by definition. Figure 2

shows the number of agencies recording the different classifications of engagement within the Resilience sample.

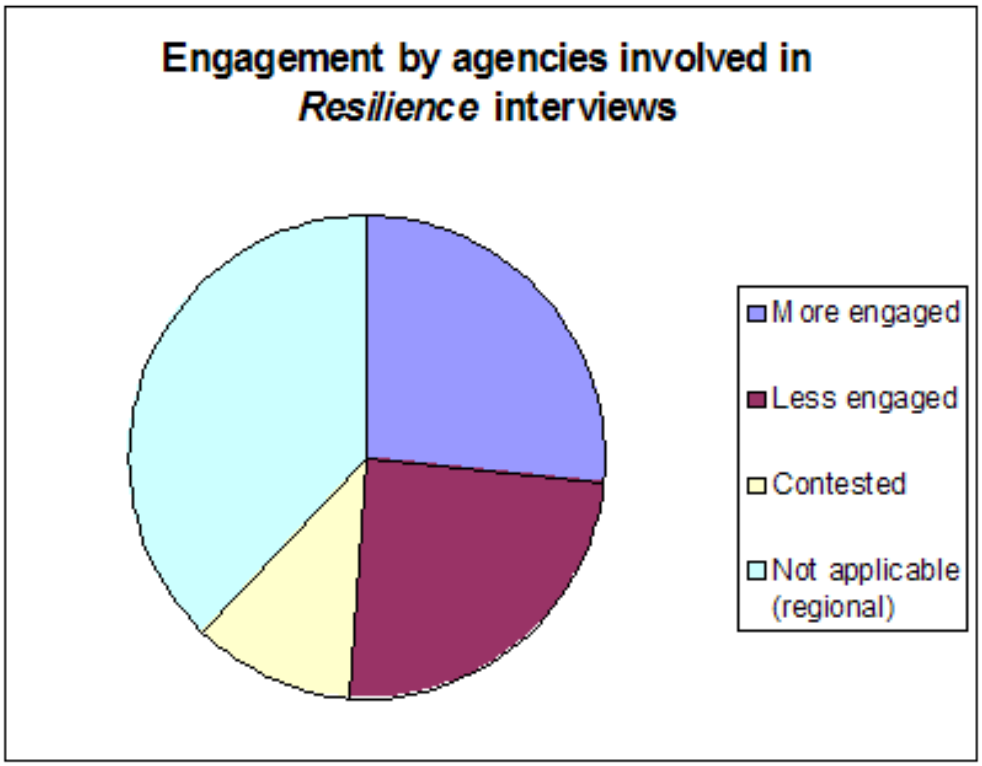

Figure 2 - engagement by agencies involved in *Resilience* interviews

Four LGs were sampled within each state and the Northern Territory. The number of NRM agencies differed between states, and so did the number of individual interviews. Each interview was a chance for respondents to put forward their ideas about NRM issues. Many of the reports show different results by state, and in each case the states are weighted equally as if the same number of interviews was conducted in each state. Figure 3 shows the number of interviews that were conducted in each state, and demonstrates that a good balance was achieved.

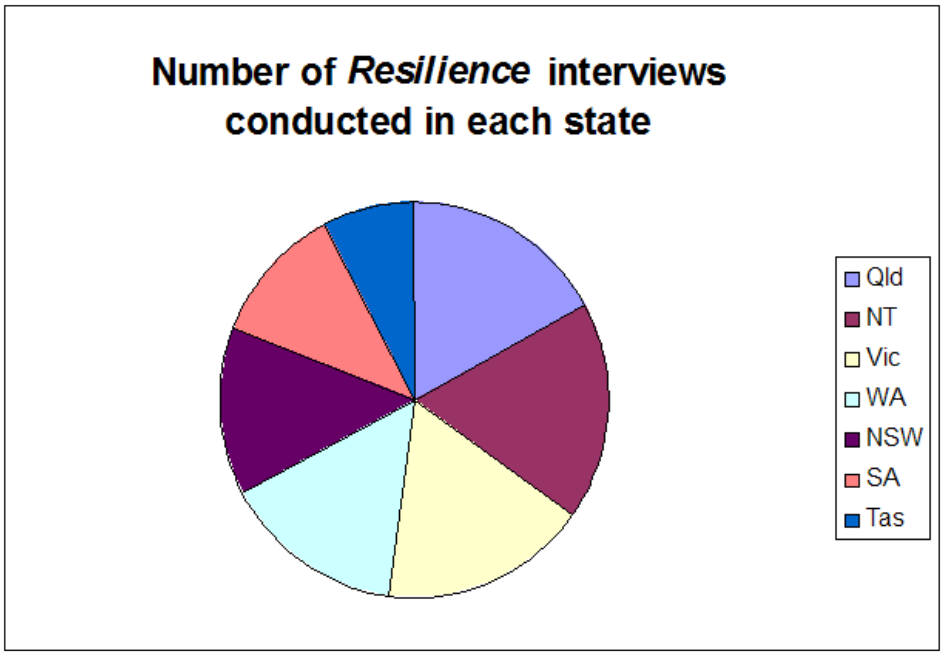

Figure 3 - Number of *Resilience* interviews conducted in each state

The Murray Darling Basin (MDB) Commission was a financial contributor to Resilience, and also held a place on the Project Steering Committee. The Murray Darling Association – a group of LGs from with in the MDB, with an interest in NRM matters was on the reference group. These groups were keen for Resilience to be able to report on any instances where an agencies presence within the MDB led to different perceptions of, or outcomes from NRM initiatives. This is also a highly valid research question, since some of Australia's most concerted and enduring NRM initiatives are based in the MDB. Three of the reports have a focus on differences within and outside the MDB, and these are reports on local perceptions of environmental problems; water, catchments and regional NRM initiatives; and consistency between LG and regional plans. Figure 4 shows the number of interviews conducted within and outside of the MDB.

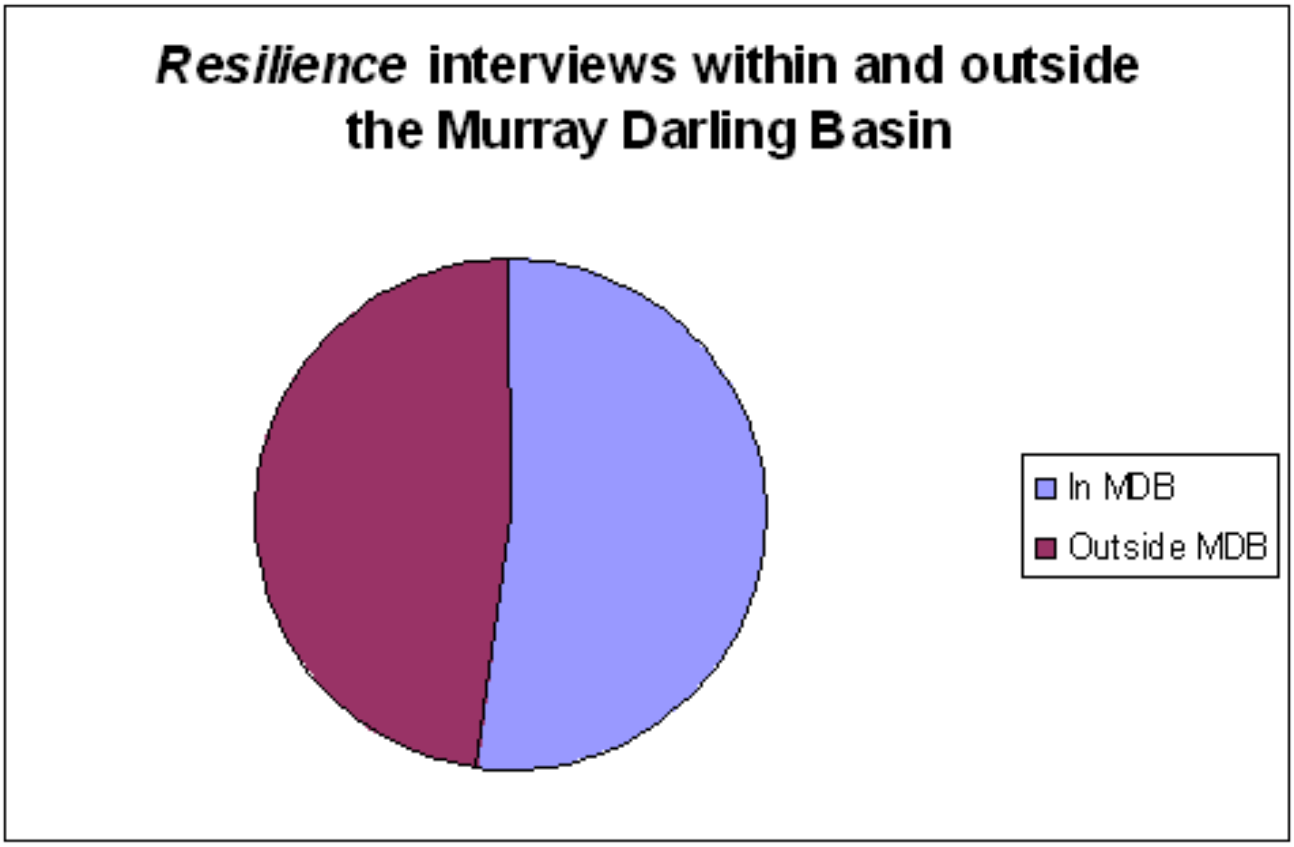

Figure 4 - *Resilience* interviews within and outside the Murray Darling Basin

No matter how different LG agencies are in terms of their geographic location, populations or financial capacity, they have some important features in common. One is the set of formal roles that are present within them. The three main divisions are between LG Councillors, Managers and Officers. The target in *Resilience* interviews was to interview at least one person from each of these roles, within each selected LG. This goal was rarely achieved because of challenges to availability of interviewees. But a good spread of these different roles was achieved across the whole sample despite this. Some further distinctions are also relevant – the managers interviewed for *Resilience* were either Chief Executive Officers or Environmental Managers. All of the officers were employed in environmental roles. Some of the Councillors were Mayors (known as Presidents in some jurisdictions). Interviewees within regional agencies were either officers or managers, all employed in environmental roles. Figure 5 shows the spread of roles among *Resilience* interviewees.

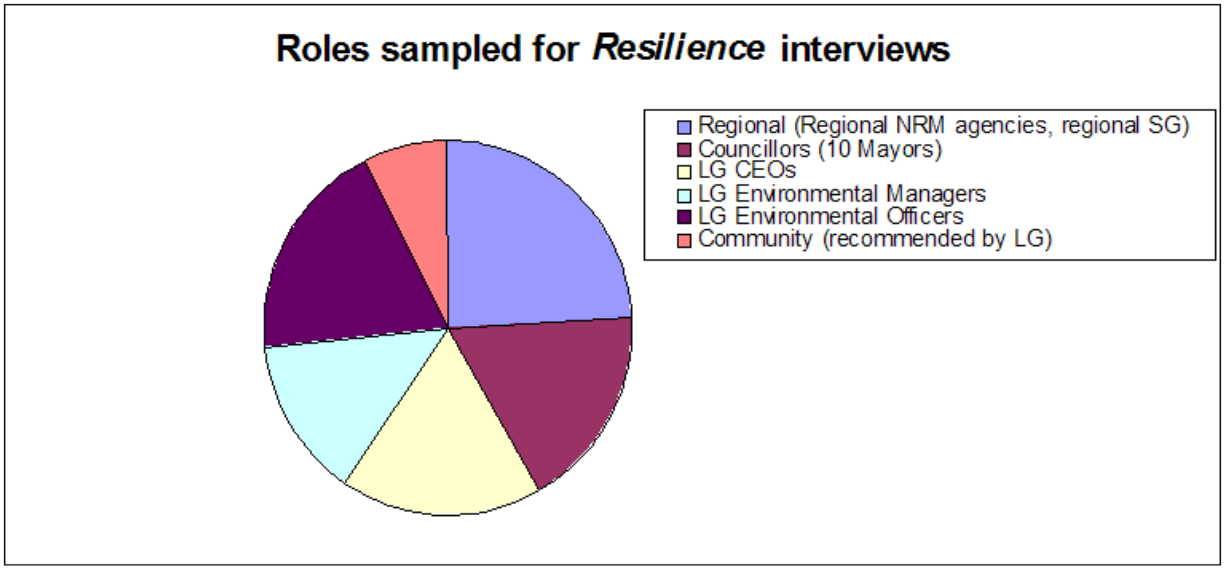

Figure 5 - Roles sampled for *Resilience* interviews

Finally, interviewees have different perspectives about the roles of LGs in environmental and other work. *Perspective* is an analytical category that describes someone's point of view, based on their experiences working in different spheres of government. People with *inside* perspectives have only worked in LG. They share a view that LGs are creatures and servants of local places and communities. *Outsiders* have only worked in state or Australian government agencies and have usually only been based in capital cities. They share the view the LGs are creatures and servants of the state governments. *Facilitators* have worked in LG and in at least one other sphere, many LGs in different places, or in organisations representing views of several LGs – such as LG Associations. They recognise that LG fulfils many conflicting roles, and find themselves in a position of negotiating between them (see the LG analytical themes report, or the journal article discussing these perspectives). The inside-out research did not target outsiders for interviews, and too few were recorded to allow reporting from that perspective. Figure 6 shows the number of people interviewed from each perspective.

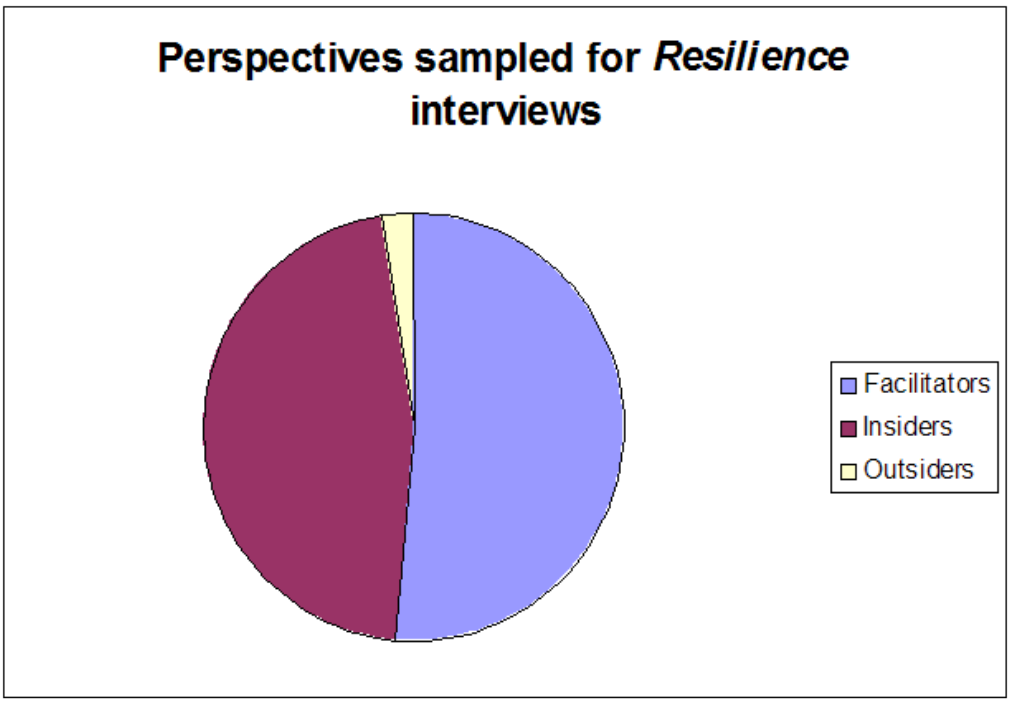

Figure 6 - perspectives sampled for *Resilience* interviews

Note that although only LG officials may have inside perspectives, those working in LG may be facilitators or insiders. A total of 18 NRM officials with facilitating perspectives were interviewed working within LG agencies.

Finally, it is worth noting that two indigenous LGs were included in the *Resilience* sample. About 10 per cent of Australia's LGs can be classified as indigenous, so this is less than would be representative. Nonetheless these were informative interviews, and many of the quotes from them have made it into the final reports.

Applying grounded theory and action research methods

Grounded theory and action research methods underpin all of the original work described here. Grounded theory methods were used because they enable new scientific findings in the absence of adequate existing theories about phenomena. The sparse literature on LG in Australia and its important potential contribution to sustainable development call for new grounded theories to better understand the LG NRM work that is happening in Australia.

As their name suggests, grounded theory methods start with an area of study and allow the issues or theories relevant to that study to emerge empirically through inductive processes. Successful grounded theories fit the data, covering all and not just some of the observations. They also work in explaining what is happening. The theories consist of analytical categories and descriptions of the relationships between them (Glaser 1978; Strauss 1990 in references). The total set of analytical categories that emerged from this work have been assembled into one document, and are discussed in functional groups within the Inside-out reports 3-14. The major analytical themes that helped to generate, or describe nested relationships between the categories are presented in a separate report.

As well as trying to understand LG NRM contributions, this research is trying to enhance them. This calls for action research methods in which the researcher is directly involved in a change proces involving cycles of reflection, planning, action, observation and more reflection that each build on previous cycles (Eden and Huxham 1996 in references). The *Resilience* Inside-out reports represent the fourth action research cycle from a long-term integrated study (Wild River 2005). Emergent research questions from each cycle have been fed into the subsequent cycles along with the analytical categories that the grounded theory methods have produced.

Combining qualitative and quantitative analysis

Grounded theory methods commonly use only qualitative data, but this need not be the case. Once qualitative analysis has delivered sound analytical categories, instances of them and the relationships between them may be counted, or otherwise represented and analysed quantitatively. Quantitative analysis has many benefits, including potentially speedy and sound empirical comparative analysis (see Manning 1987; Strauss and Corbin 1990; Babbie 1989 in references).

Both qualitative and quantitative data are valuable to this analysis, and quantification is used when it is logical, practical and meaningful in helping the grounded theories to work well in explaining phenomena. Microsoft Excel software has been used to produce graphs of several different types, which are used to display different types of quantitative data. They include:

- Pie charts – in this report only, to describe the characteristics of the *Resilience* sample;
- Simple bar charts – used to give overviews of quantitative data in its most aggregated form;
- grouped columns – when comparisons between similar groups are most important;
- total stacked columns – to compare the contribution of each category compared to the total number; and
- per cent stacked column charts are used to elaborate each of these issues, comparing the per cent that each category contributes to the total across categories.

When multi-dimensional issues are discussed, simple bar charts are used to explain the broad patterns, and then integrated stacked bar charts are used to disaggregate the data view all issues at once. The discussions then work systematically through each of the issues, starting with those that have the strongest patterns in the distribution.

Note that throughout all of these reports, the comparative importance of different issues is estimated by the frequency of times that respondents mentioned it. The data were weighted equally so that data sets with unequal numbers of respondents were compared. For instance, 25 of the 53 interviews were conducted with agencies outside of the MDB, and 27 were conducted within the MDB. When comparing the number of comments on a particular issue between and within the MDB, the graphs were constructed as if 26 interviews had been conducted in each setting. To do this, the number of times that each category was used was multiplied by 0.96 for MDB agencies, and by 1.04 for the others.

Gap analysis

Gap analysis is a survey technique for quantifying respondents' views on the gap between the importance and effectiveness of initiatives. Gap analysis was used in the *Resilience* survey to elicit responses about the Outside Information, and about five other generic NRM issues.

A scale of 1-5 was used, as shown in the following table. Respondents were shown this scale, and asked a series of double-barreled questions where the first asked them to rate the importance, and the second the effectiveness of the same issue. Results were analysed for both the magnitude of importance ratings and the size of the gap. A high score for importance and a large gap indicated a problem, which was be further explored by recording open-ended responses to the same issue.

Importance	Completely unimportant	Unimportant	Neither	Important	Critically important
Score	1	2	3	4	5
Effectiveness	Totally ineffective	Ineffective	Neither	Effective	Completely effective

Five of the reports present results from gap analysis questions. These are:

6 – Responses to the Outside Information;

7 – Local contributions to regional and national databases;

9 – The resources needed to fulfill local NRM roles;

12 – Coordination between spheres;

13 – Consistency between local and broader plans.

One other issue was investigated using gap analysis. This explored the importance and effectiveness of the connections that published information made between different types of NRM issues. This was not carried forward into a report since qualitative data analysis failed to reveal any strong patterns in the results.

The *Resilience* survey

Other than the the quantitative questions from the gap analysis, the *Resilience* survey was an open-ended survey tool. The survey is included as a separate document.

The *Resilience* survey was developed and refined continually during the research process, as new insights allowed for better targeted questions. At the same time, continuity between early and late surveys was a goal, so the themes that are covered in the final version of the survey are mostly the same set as at the start. The survey's structure and content drew on four main groups of ideas, whose contribution to survey design are discussed here:

- respect for respondents – recognising that they are busy, with only a little time available, and that a good interview relied on trust being established quickly;
- the results of the three previous action research cycles described above, further exploring some previous interesting results;
- ideas from grounded theory, aiming to draw on practitioners' experiences to discover and explain new analytical categories that fitted and worked in explaining LG engagement with NRM; and
- statistical science, which uses explanatory and response variables, and seeks shapely data sets.

All of the respondents were busy people. They included Chief Executive Offices, Mayors and other councillors, and over-worked officers. One of the main ways of showing respect for this was to visit them on-site, thus not costing them anything in travel time. This also shows respect for LG officials, who always appreciate people visiting their own local area, so that they can get a feel for it themselves, as well as making financial contributions to the local economy. Another way to show respect was to make sure that the survey process was an enjoyable, learning experience for respondents. This was achieved by sharing information with respondents, and focusing on questions that reliably drew enthusiastic and passionate responses. Information sharing was partly achieved by giving respondents a copy of the Outside Information during the course of the interview, and teaching them how to use it as part of the interview process.

After a few pilot interviews, it became clear that an excellent way to establish trust early was to describe the key theoretical contribution that had already emerged from previous research cycles. That was the local-state antinomy. Hence, in introducing myself, I briefly explained the theory, welcoming comments on it. It was very rewarding as a researcher, that people universally agreed with the theory, and felt that it aided their understanding of a vexed question. This part of the survey established trust by showing the sorts of results that I was aiming for with this research, and that these were also of interest to respondents.

In using ideas from grounded theory, the survey questions aimed to draw out concepts that fitted and worked across different contexts in explaining LG engagement in and contributions to NRM. Insights from statistical science helped to guide the selection of questions that could do this. The idea of shapely data is that meaningful responses contain variation related to explanatory variables. Useful explanatory variables that had emerged from previous studies – they were discussed in the section on the resilience sample above. So as well as settling on questions that drew passionate responses, the final survey also contained questions that drew highly varied responses.

Inducing analytical categories

Qualitative induction was assisted by N-Vivo software. This was a suitable choice since it is designed around grounded theory methods to assist the discovery and understanding of analytical categories. N-Vivo is designed around two parallel systems of data management – documents and nodes. In this case the documents were transcribed interviews. Nodes are the analytical categories that emerge during qualitative data analysis.

A *typing master* document was developed to assist the data analysis process. It contained headings summarising the central idea being explored by each survey question. Survey responses had been touch-typed during interviews, ensuring that answers to questions were under the relevant headings. N-Vivo has an *automatic coding* feature that can use headings in specified styles as nodes. This approach enabled speedy coding of all responses to a question under a relevant nodes for analysis. Hence, each of the the Inside-Out reports is based on results from one or several survey questions, that were automatically grouped for analysis.

After gathering together all of the responses to individual questions, I browsed the full set of responses, looking for concepts that were repeated between questions. These became nodes, or draft analytical categories, and were refined further as I hand-coded responses to each interview question.

The N-Vivo *browse* feature was used to search results for independent groups of concepts within a single answer. When these were identified they would allow for multi-dimensional analysis. The most common example was that used in analysing gap analysis responses to generic NRM questions. This was the category of *drivers and constraints by sphere interactions*. Each response to a gap analysis survey question had a substantive point to it – for instance being about money, initiatives, cooperative efforts and other practical features. But they also dealt with one or more spheres of government, and discussed whether the substantive issue was driving or constraining NRM efforts. The drivers, constraints and sphere interactions were apparently independent of the substantive issues, since any combination of results was possible, and most combinations occurred at some stage during interviews. Hence, each generic gap analysis answer was coded as a substantive issue,

and as a driver or constraint by sphere interaction (for more on drives and constraints by sphere interactions see the analytical themes report). When only one type of answer was identified the analytical emphasis was on the impact of explanatory variables instead.

An N-Vivo tool equivalent to cross-tabulation was used in initially reviewing coding results and deriving quantitative results. This is called a 'matrix intersection search'. It produces a two-dimensional table showing the number of responses coded within each of a set of paired nodes. Each of the cells in the N-Vivo matrix is a new node, and can be browsed to check results and interpret findings. In this case, the quantitative results were used to construct bar charts (using Microsoft Excel), and qualitative results were collected into the documents that are hotlinked to each Inside-Out report.

The next steps

The Inside-Out reports are the most exhaustive outputs planned from *Resilience*, but they are not the end of the story. The next step is to communicate these results to state and Australian government policy makers and practitioners working in NRM fields, as well as to the local and regional practitioners who helped to inform them, and who otherwise have an interest in them. If stakeholders from broader spheres can understand and apply some of the learning presented here, then this process will help to achieve the core project goals of enhancing LG capacity for NRM through information exchange. Academic audiences are another target group for these results, so that findings can help to contribute to the systematic enhancement of knowledge on these matters.

The specific communication strategy in the next stages of this research are to give presentations to large groups that include participating agencies together with other interested parties. A key strategy will be to offer presentations at upcoming statewide and national Local Government Association Conferences, and gatherings of regional NRM facilitators. Those networks, as well as other professional networks such as the *Environment Institute of Australia and New Zealand* will be called on to help arrange seminars in each state capital city, and to encourage attendance from NRM stakeholders from multiple state agencies. If keynote addresses, or presentations to large audiences cannot be arranged, then smaller meetings, or conference breakout sessions will be sought instead.

All of this face-to-face communication will be backed up by the availability of professionally produced and accessible versions of these Inside-Out reports. A CD-Rom with the full results will soon be produced. An internet version is anticipated. And some paper versions of key documents will also be produced.

The academic reporting will be through peer-reviewed journal articles. Before the face-to-face presentations commence, a proposed list of papers will be put forward, with target journals identified. The papers will be produced and submitted during the next year.

Chapter 2: Local government analytical themes

Resilience inside-out report 2

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Background and summary

The purpose of this report is to give background, details and discussion about some of the key analytical categories raised in Resilience Inside-Out reports. Those categories are labeled as themes here because they each helped to shape this research, and also appear in multiple reports. They can therefore be considered as more than just individual categories. In pulling together these major analytical themes this report serves two purposes:

- it minimises repetition within the reports, since it avoids the problem of fully explaining each of these major themes each time they are used; and
- it gives a point of focus for those themes that emerged most commonly across reports, and therefore have the greatest likely contribution to learning on the issues covered in the total set of reports.

The analytical themes are presented in two groups:

- themes that were used in sample selection, and also emerged as powerful explanatory variables or findings. These include engagement, perspective and location within or outside of the Murray Darling Basin (MDB); and
- other established themes that have been carried into this set of reports through other research cycles. These include drivers and constraints by sphere interactions and the Integrating Themes, which come from earlier inductive research by Land & Water Australia, and are a component of that agency's current Strategic Research and Development Plan.

Themes used in Sample Selection

The three themes that were used in sample selection, and have also frequently been used as either explanatory variables, or otherwise to guide findings in several reports are engagement, perspective and location within or outside of the MDB. All three of these themes were highlighted in the original project proposal, and all have proven to be analytically rich during data analysis. The origins and application of these three themes are now discussed.

Engagement

The project proposal states:

> "Federal and state NRM [natural resource management] programs have historically appealed to the comparatively rich, populous and compact LGs in capital cities, capital fringes and other centres. The reasons for this are poorly understood, but include the extra resources and access to policy communities enjoyed by those LGs. Meanwhile rural LGs with small populations, few resources and large areas of land facing NRM problems rarely engage with programs intended to help them. Most, if not all, federal NRM, environmental and sustainability initiatives would benefit from enhanced models and strategies for engaging with these rural LGs which make up about 72% of the total of over 700....

> "The project will strategically select participant LGs from among those that have most to gain from the federal programs, but have been least engaged with them in the past. It will aim to discover and describe reasons for previous failures and test and recommend ways to reduce future failures. The technical failure for the participating LGs will be reduced during the project time frame, and the resulting models and strategies will be applicable to other LGs and other programs."

The Methodology Report includes a discussion of the processes used to select a mix of more and less engaged LGs for the project, and the high level of success that was achieved in making the selection.

Engagement was used as an explanatory variable for the gap analysis reports, each of which included a bar chart showing differences between perceived importance and effectiveness of the issues being investigated, by an agency's level of engagement. An example of one such graph (from the Resources Report) appears below. The difficulty in using engagement as an explanatory variable is clear from this chart. Four categories were needed to account accurately for all levels of this variable, leaving relatively few individual records in each of the four categories. Further, the differences in the views expressed by LGs with higher and lower levels of engagement appeared to be less significant than those between regional agencies and the LGs. There also seemed to be differences between views expressed by LGs with contested engagement and the other LGs, and this again inhibited the value of engagement as an explanatory variable. When the qualitative statements that underpin these results were analysed, there were also no clear differences in the views expressed by respondents depending on their agency's engagement level.

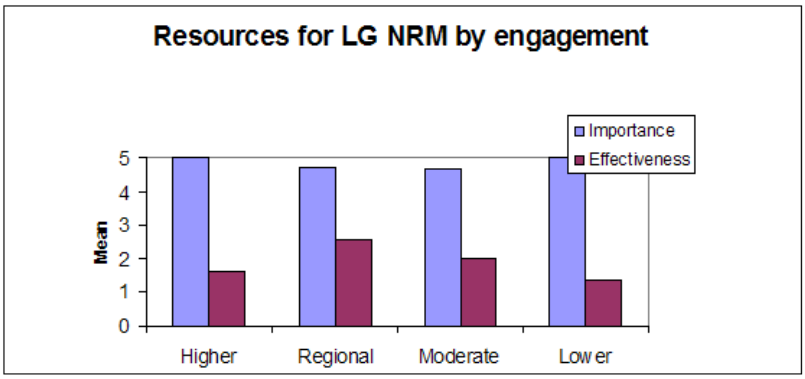

Figure 1 - Resources for LG NRM by engagement

Engagement did emerge as an interesting response variable. Specifically, this means that engagement was a good focus for survey questions, and respondents saw it as interesting and relevant to their NRM work. The results from the survey allow the proposal of a formal definition for engagement.

Engagement is defined as "the degree of involvement in NRM projects and strategic NRM initiatives" and has three subcategories:

- **High** – actively involved in a range of NRM projects *and* in strategic NRM initiatives including Boards of regional NRM committees, consultative committees working on regional plans, or other strategic initiatives that contribute to those plans,
- **Moderate** – actively involved in a range of NRM projects funded through national or state initiatives or forming part of the implementation of NRM plans, and
- **Low** – involved in none or very few NRM projects funded through national or state NRM initiatives, or forming part of the implementation of NRM plans.

Note that this classification would remove the need to identify any LG agency as having *contested* engagement. Each of those that had been listed as *less engaged*, but claimed to be *more engaged* could have been more formally classified as *moderately* engaged.

In addition to this definition, the analysis of survey questions on engagement gave rise to many insights into the drivers and constraints to engaging LGs in NRM initiatives. These results are covered in detail in the report on LG engagement in NRM programs.

Perspective

Perspective is an analytical category that describes someone's point of view, based on their experiences working in different spheres of government. The results of previous research into this theme have been published in the academic literature, as one of the outputs from this project (Wild River 2005). There is an overall definition and three subcategories as follows.

Perspective: The point of view of conceptual framework of a person that provides their insight into LG environmental issues. There are three subcategories to perspective:

Inside: Seeing LG environmental issues from a local perspective. Derived from having worked in LG and no other sphere of government.

Outside: Seeing LG environmental issues from a broader perspective. Derived from having worked in regional, state or federal government agencies, but not in LG.

Facilitating: Having a conceptual framework that accepts both other perspectives. Derived from work experience in LG Associations, or with both LG and

another sphere of government, including a regional organisation or a regional office of a state agency (see analytical categories).

The analytical theme of perspective defined the overall methodological framework for *Resilience*. The project proposal stated:

> "Those few studies that have been made into LG have generally taken an outside-in approach, considering LG from state or federal perspectives. Federal and state government NRM programs are also typically designed around outside-in models, where generalised information is presented to LGs, and they are left to find the local meanings themselves. Resource shortages appear to be just one of many reasons why rural LGs face constraints in engaging with this type of program.
>
> "The current failure of most rural LGs to engage with federal and state government NRM programs is bad for Australia. It means that money is wasted in programs that do not effectively target those local areas that could benefit most from them. It restricts the success of those programs and it deepens inequalities between LGs while constraining intergovernmental relations.
>
> "An alternative to the traditional outside-in models for NRM initiatives is an inside-out approach that recognises and works with the local perspectives. These perspectives underpin fundamental differences between the priorities of the different spheres and are poorly understood by federal and state governments."

Resilience used the analytical theme of perspective to explore ways to enhance information exchange between spheres of government. It produced an Outside Information Kit, based on knowledge that is managed by agencies other than LGs, and used novel approaches to transform it into a form that was appealing to NRM officials with inside perspectives (see the report on responses to the Outside Information). The *Resilience* interviews successful targeted a balanced sample of people with both inside and facilitating perspectives, and only two outsiders took part in interviews. This means that the Inside-Out reports do reflect the perspectives and priorities of insiders (since facilitators also understand inside perspectives).

Two of the Inside-out reports also used perspective as an explanatory variable to explain the findings. These were the reports on learning about environmental challenges and water, catchments and regional initiatives. In addition, an entire report focuses on the local-state antinomy, which is a theory put forward in previous research by this author, and is based on the different perspectives held by environmental practitioners who have worked in and with different spheres of government.

Murray Darling Basin

As was discussed in the methodology report, there were several reasons for using location within or outside of the MDB as an explanatory variable. The Murray Darling Basin Commission was a financial contributor to *Resilience*, and also held a place on the Project Steering Committee. The Murray Darling Association – a group of LGs from with in the MDB, with an interest in NRM matters was on the reference group. These groups were keen for *Resilience* to be able to report on any

instances where an agencies presence within the MDB led to different perceptions of, or outcomes from NRM initiatives. This is also a highly valid research question, since some of Australia's most concerted and enduring NRM initiatives are based in the MDB.

There was a good balance between interviews conducted within and outside of the MDB, with 27 interviews conducted within and 25 outside of the MDB. Three of the reports have a focus on differences within and outside the MDB, and these are reports on local perceptions of environmental problems; water, catchments and regional NRM initiatives; and consistency between LG and regional plans. Presence within and outside of the MDB was also presented as an explanatory variable in each of the gap analysis reports. The gap between importance and effectiveness was generally smaller within than outside of the MDB, suggesting that the history of concerted efforts at regional coordination for NRM outcomes within the basin has been relatively successful.

Established themes

The two established themes that were further explored in this research were drivers and constraints by sphere interactions, and the Land & Water Australia Integrating Themes. These are discussed here.

Drivers and constraints by sphere interactions

Previous research by this author investigated drivers and constraints to LG attempts to deliver beneficial environmental outcomes (see Wild River 2002; Wild River and others 2002). This work had determined that flawed interactions between spheres of government – especially those based on misunderstandings of differing perspectives – were key constraints to the successful delivery of beneficial environmental outcomes by LGs. In coding the results from gap analysis interviews, it quickly became apparent that it would be possible to construct a compound analytical category that simultaneously took account of both whether an issue was being expressed as a driver or constraint, and whether that force was sourced within or between spheres of government. There are four subcategories in this compound variable:

- constraints between spheres;
- drivers between spheres;
- constraints within spheres; and
- drivers within spheres.

Formal definitions of each component of this compound variable are now provided, along with quotes that show the types of statements that were coded.

The first variable deals with the nature of the stimuli, and the two subcategories are drivers and constraints. A *driver* is "a force causing or helping effective NRM".

> **Driver**: "I think we need the plans. But there should be enough flexibility so that a local plan should be able to be fitted into the broad plan. Policy should be able to encompass that rather than direct it." *Northern Territory Indigenous LG group. Driver between spheres.*

A *constraint* is "a force stopping or hindering effective NRM".

> **Constraint**: "There is a feeling in LG that there is a push to offload things to LG. Many councillors and council staff understand that the Commonwealth and states are pushing more towards LG, and they also understand that the funding is not coming from the state governments or Australian government for the work. Or they will get council to do something, and fund it initially, and once it becomes hard to withdraw the services, they will pull back the funding." *South Australian LG Environmental Manager.*

The second variable within sphere interactions relates to whether a stimulus comes from within or between spheres of government. Note that regional NRM agencies were regarded as a sphere of government for the purposes of this analysis. A force operating *within* a sphere is "a force or stimulus whose origin and impact is restricted to one sphere of government, including a regional organisation". However it may extend to several agencies within a single sphere – for instance several or all LGs.

> **Within**: "It is important that someone has a statutory authority. Lots of responsibilities get put onto LGs, and the workload for people in the west is huge. I am a qualified building certifier. To retain my certification I have to get a certain number of points every year. The conference this year is in Cairns, and I would need to go there to get my points. So I would travel for 3 days to get there, and be out of my office for 8 days. You struggle to get the days away, and then you struggle to catch up when you get back. And I am the only building surveyor here, so I need to keep it. Since the Hillmer Report, we can have private certification for it, but the private certifiers don't come out here." *Southern Queensland LG Environmental Manager*

The definition for *between* spheres is "a force or stimulus whose origin and impact crosses spheres of government, including regional organisation. For instance, it may relate to funds sourced at state level, and distributed through regional organisations to LGs."

> **Between**: "There are very few NRM staff with much LG experience. There doesn't seem to be much cross-over. Our regional agency has about 40 staff, and from what I can gather, I am the only one who has ever worked in LG. I may be wrong, but I haven't heard of anyone else with that cross-over. LG is a culture in itself, and if you want to work with a particular sector then you have to understand how they think. You wouldn't get someone working in the cotton industry who didn't know something about cotton or irrigation." *Southern Queensland NRM Facilitator.*

These quotes show how substantive issues appear together with views on whether they are drivers and constraints and what spheres are involved. One of the keys to making sense of issues between quotes is to define substantive issues that may be logically occur as either drivers or constraints, and where that occurrence will relate to one or more spheres of government. Successful coding and reporting also relies on naming the substantive categories as positive features. If this is not done, then confusion arises with double-negatives in the results. For example, the category referring to availability of cash is called *money* rather than *poverty* even though the absence of money is more commonly reported than its availability. That way a *driver* involving *money* is clearly beneficial, while a *money constraint* equates to poverty.

Figure 2 shows the total number of times that each of the four subcategories was mentioned, across all interviews in which this coding was used. This shows clearly that constraints between spheres was the most common expression of these issues.

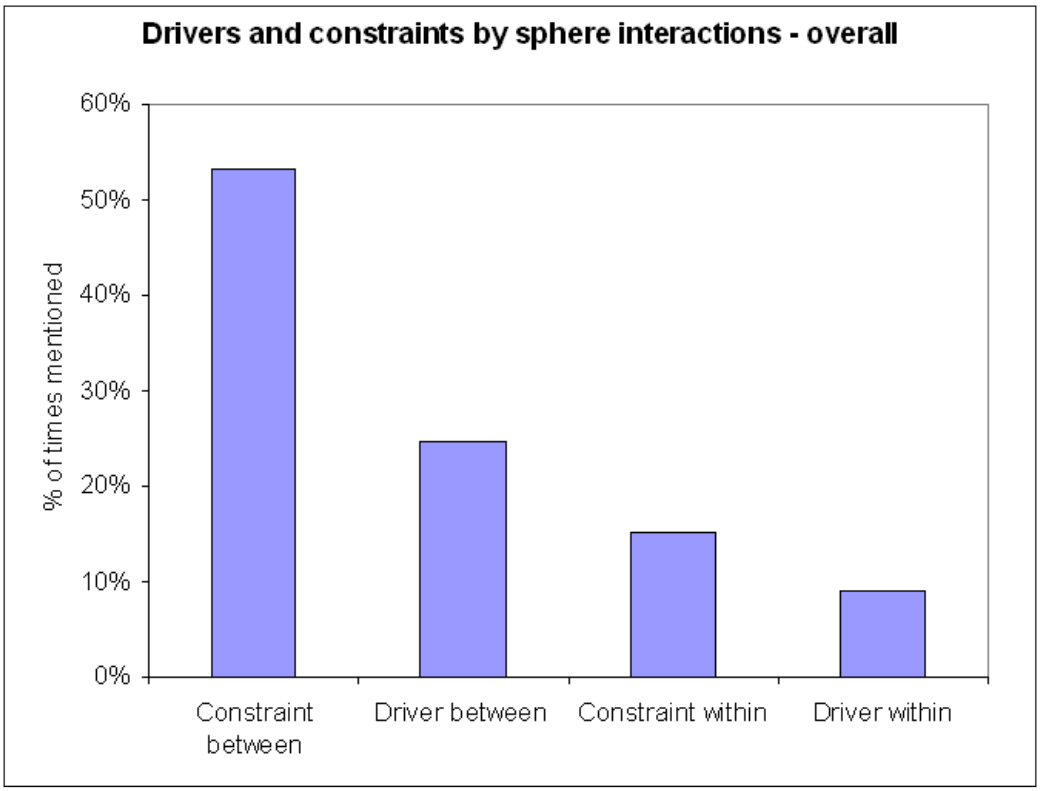

Figure 2 - Drivers and constraints by sphere interactions - overall

The compound variable of drivers and constraints by sphere interactions was successfully used in the coding and analysis of all generic NRM issues. The results are found in the following reports:

7 – Local contributions to regional and national databases;

9 – The resources needed to fulfill local NRM roles;

12 – Coordination between spheres;

13 – Consistency between local and broader plans.

Land & Water Australia integrating themes

The Land & Water Australia integrating themes were included in the project proposal, which stated that:

> "[The survey] will use Land and Water Australia's Integrating Themes as a theoretical framework. As such it will consider the
>
> - *perceptions and values* held about local NRM issues,
> - how LG officials and community members are *learning and understanding* about these issues and whether any federal or state NRM programs are helping with this,

- how the LG and communities are *living in and managing* their environments, and
- how the LG *organises and governs* for NRM and sustainability."

The integrating themes themselves are analytical categories that give a novel framework for understanding areas where change is needed in order to improve the delivery of NRM outcomes (see Wild River and Chaplin 2000). One useful observation from using the themes is that Research and Development Corporations, and other research bodies tend to focus most of their attention on the second and third themes of *learning and understanding* about, and *living in and managing* environments. But the first and fourth themes are equally important if beneficial changes are to be achieved.

The integrating themes helped to inform the range of survey questions, which were designed to provide balanced insights into all four of the integrating themes. The overall set of Inside-out reports is also structured around the integrating themes, however they are not perfectly balanced. Two of the reports focus on *perceptions and values* while four are in the section on *learning and understanding*.

Chapter 3: The most important local environmental problems

Resilience inside-out report 3

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> "Probably the biggest issue is that we have to show the communities that you can enhance your local environment and still sustain farming practices. I'm not sure at the moment that we are really doing that, but its probably the key to the whole lot of it. If you are spending money on natural resource issues then your water quality will improve, you won't get the erosion. We need to teach people that we are on the right track." *Western Victorian local government group.*

Executive summary

This report presents a national analysis of local and regional perspectives on Australia's most important environmental problems. It presents the responses of 79 local and regional natural resource management (NRM) practitioners to the question "what do you perceive as the most important local environmental problem?" The practitioners each work in locations that were identified at a broad scale – by the National Land and Water Resources Audit (the Audit) – as having significant, multiple NRM problems. These included stresses to land, biodiversity, climate and human settlements.

The most important environmental problems, in order of the number of times that they were mentioned are:

- **Human settlements** – knowledge-institutions, land use and tenure, sustainable agriculture, pollution and waste, finance, indigenous
- **Biodiversity** – weeds, native plants, feral animal animals, native animals, fire
- **Water** – quality, water general, quantity, groundwater
- **Soil** – salinity, other
- **Climate**; and
- **Coastal** problems.

There was a fairly high level of agreement between the Audit's 'outside' account of important local environmental issues, and those reported by local practitioners. Climate change issues were the main exception, with few local practitioners listing these as important. Local accounts of the most important environmental problems appear to differ between states, and within and outside of the Murray Darling Basin. All of the practitioners interviewed mentioned more than one environmental problem, with those outside of the Murray Darling Basin tending to mention more than three in each

interview, and those within mentioning slightly fewer. People from the Northern Territory, and Tasmania tended to mention a greater range of environmental problems than did others, and individuals from South Australia and New South Wales mentioned fewer discrete problems.

An executive summary of all key findings from *Resilience* and detailed project methods are all available as separate, linked documents, along with the remaining 'inside-out reports'.

Background to the local environmental problems report

Resilience is a Land & Water Australia project aiming to enhance rural local government (LG) capacity in natural resource management (NRM). Its focus is on enhancing the understanding that different spheres of government have of one another generally, and of NRM efforts in particular. Resilience is working with 28 local governments – four from each state. All participating LGs face serious, multiple NRM challenges, and have mixed levels of prior engagement in regional, state and national NRM initiatives.

The project explores a number of analytical themes related to LG environmental management (see analytical themes report). One is the difference between inside, facilitating and outside perspectives on environmental issues, where inside perspectives are held by LG practitioners who have worked in no other sphere of government, facilitators have worked in local and other spheres, and outsiders have not worked in LG. There were very few outsiders interviewed for this series of 'inside-out' reports, with outside perspectives instead being represented through the provision of tailored information from the National Land and Water Resources Audit (see responses to outside information).

An open-ended survey was used to gather data for these reports. Among many other questions, this asked respondents:

> "what do you perceive to be the most important environmental problems in the local area?"

The results were coded using inductive methods, and are reported here. Qualitative analysis was used to identify analytical categories for the different types of environmental problems that were raised. This report differs from most of the others in this series by not presenting definitions of the analytical categories. That is because most of the categories raised here describe environmental features which are better described in the broader NRM literature.

The simple quantitative method of building bar charts to compare the number of times that issues were mentioned is used to help approximate the relative importance of each issue that was mentioned. Graphs are presented along with the most relevant section of text. The early sections of the report give an overall analysis across the full set of environmental problems that were reported. The later sections look in detail at different types of environmental problems. Additional analytical categories and bar charts are included for the four problems most commonly mentioned – human settlements, biodiversity, water and soil. Bar charts showing the finer detail of those categories of problems are presented along with the later discussions.

There is a paper and electronic version of each report in this series. Both sets of reports make extensive use of direct quotes from practitioners. This is intended both to add richness to the

analysis and to give credit to the original sources behind the work. The electronic versions include hotlinks to the full set of original quotes that have informed each report, ensuring transparency, and allowing readers to view for themselves the origins of the entire analysis. Anonymity of respondents has been preserved but important information about them is provided through the use of codes that tell of their role, agency-type, and the state in which they work.

Quantitative results

Figure 1 shows the range of environmental problems that were reported as being the most important locally. It also shows the number of times that each was mentioned. Problems related to human settlements and human systems were mentioned most often – approximately once by each interviewee, and nearly twice in every interview. Biodiversity problems were mentioned next most often – approximately once per interview. Water was mentioned nearly as often. When responses from different states are rated equally, water problems appear as often as biodiversity problems (see Figure 3). Soil was also often mentioned – in nearly half of all interviews, while climate and coastal issues were quite rarely identified as important.

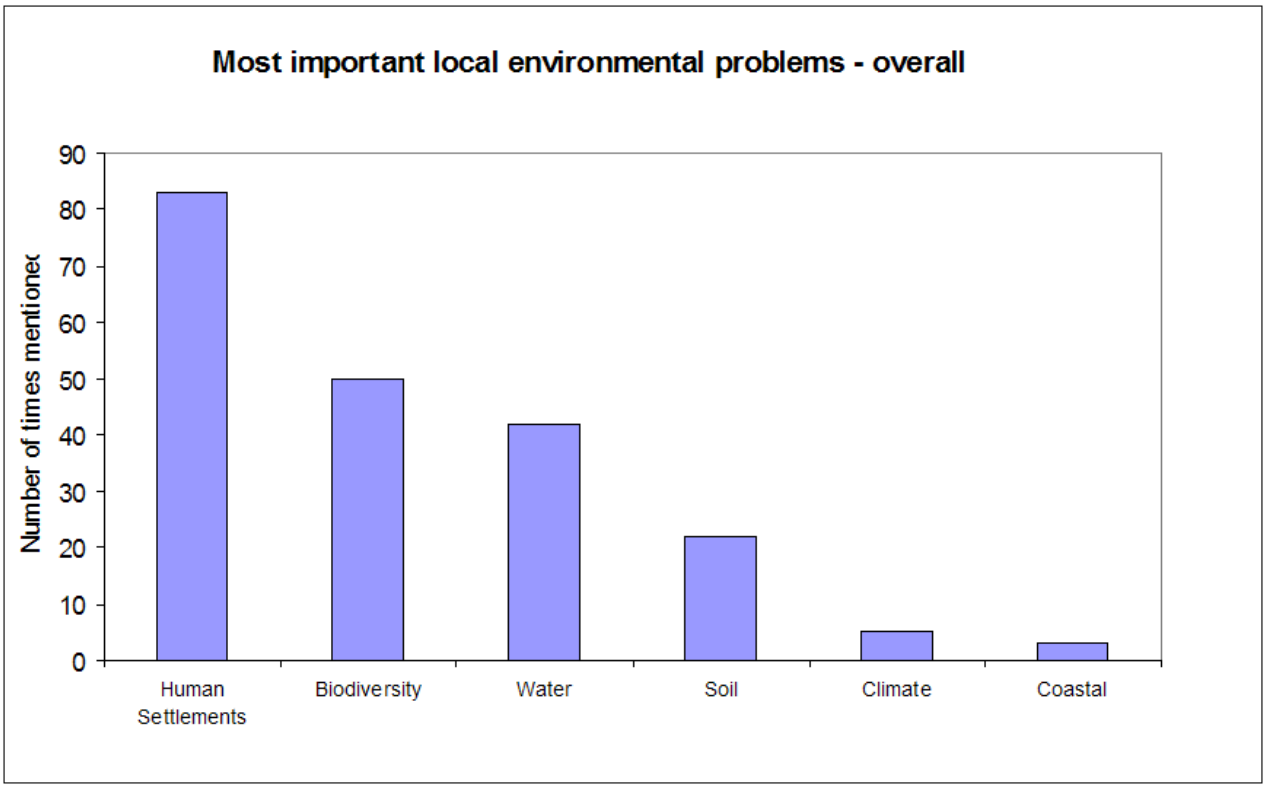

Figure 1 – Most important local environmental problems - overall

Figure 2 shows the level of agreement between inside and outside perceptions of environmental problems. This graph was constructed by first listing each of the broad NRM issues that were identified in the Resilience Outside Information as being important for each of the participating LGs. These results were compared with the broad groupings of NRM issues mentioned during interviews as being important to LGs. When both the outside information and a local or regional practitioner identified a local problem within the same broad group (eg water), the category of 'both' was assigned. When a problem was only identified in the outside information, this was categorised as 'outside only', and if only local and regional people identified it then it was recorded as 'inside only'. When neither source identified a problem, the category was 'neither'.

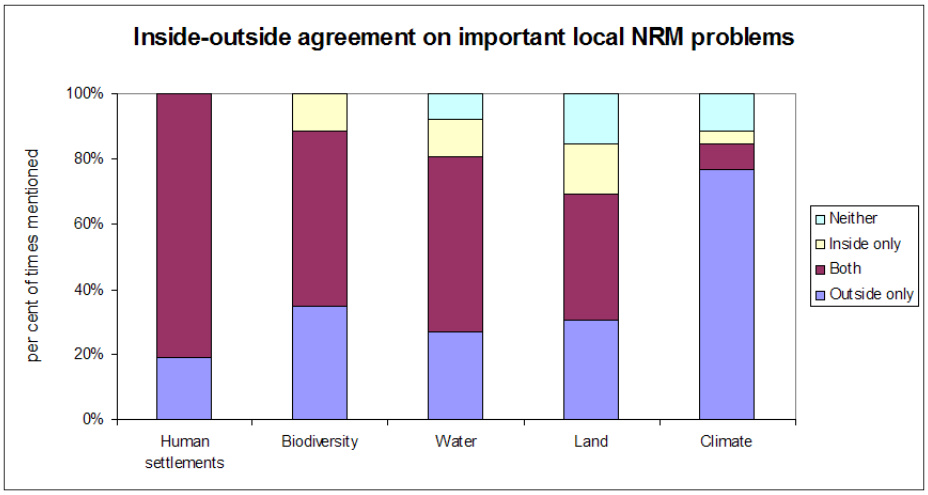

Figure 2 - Inside-outside agreement on important local NRM problems

The results of this analysis show considerable agreement between inside and outside sources in recognising NRM problems. This was especially in relation to human settlements, biodiversity and water problems. Both outside and inside sources identified problems in more than half of the local areas.

Climate was the only NRM problem area where insiders were far less likely to identify problems than were outside sources. However it should be noted that the method that was used to develop this graph involved an audit of outside information, which was not extended to the inside sources. If insiders had been given a listing of possible NRM problems to choose from, more might have identified climate problems than did. Hence, the main value of this result is to show common thinking, rather than differences.

Figure 3 shows how often each environmental problem was mentioned by state and territory jurisdictions. The results have been weighted equally, as if the same number of people were interviewed in each state. Note that there does not appear to be any bias here in relation to the order in which interviews were conducted, since there is no correlation between that order, and the order in which the states are represented here.

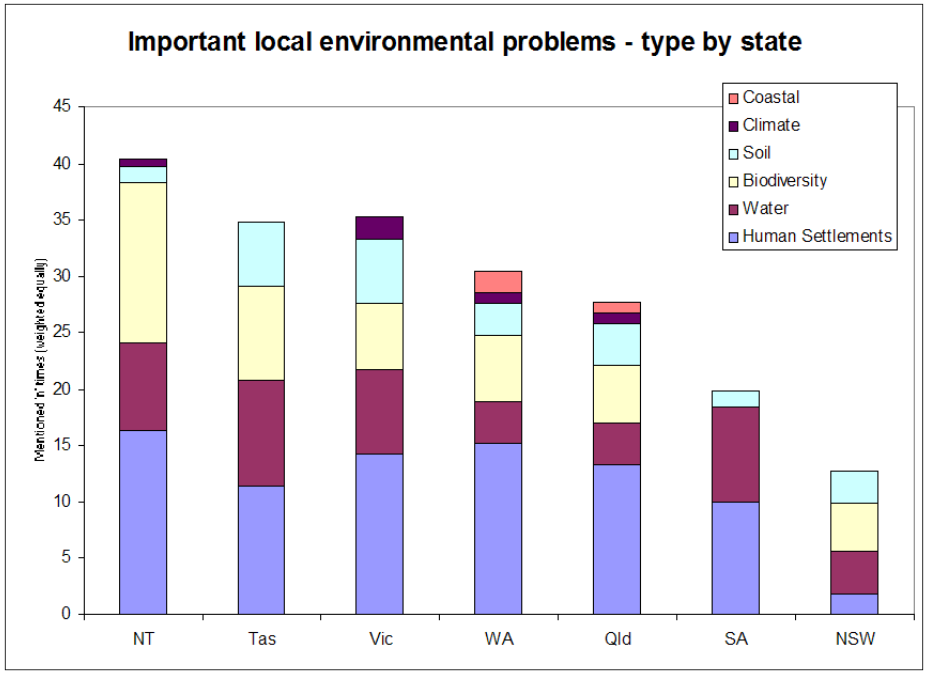

Figure 3 - Most important local environmental problems - type by state

There was considerable difference between states in the number of important environmental problems that were mentioned. Respondents from the Northern Territory mentioned nearly three times as many different sorts of environmental problems as did those from New South Wales. There was also a very wide range of environmental problems mentioned by respondents in Tasmania and Victoria, followed by Western Australia and Queensland. The source of this differences is not readily explained.

There was a high degree of agreement between states in the relative importance of each type of environmental problem. The main differences were that biodiversity issues featured more highly in the Northern Territory than in other jurisdictions and water featured more in South Australia and slightly less in Western Australia and Queensland.

Figure 4 shows how often each type of environmental problem was mentioned by respondents based within and outside of the Murray Darling Basin (MDB). Again, the results are weighted equally, as if the same number of people were interviewed within and outside the MDB. Like inside and outside perspectives, the MDB is another major analytical theme for *Resilience*. The key questions here relate to the long-term presence of regional NRM agency within the MDB, and relative continuity between previous initiatives such as Integrated Catchment Management and current initiatives in regional NRM planning. If local engagement with NRM problems and initiatives differs between agencies within and outside the MDB, then there might be valuable lessons to be learned for improving the long-term outcomes from current initiatives.

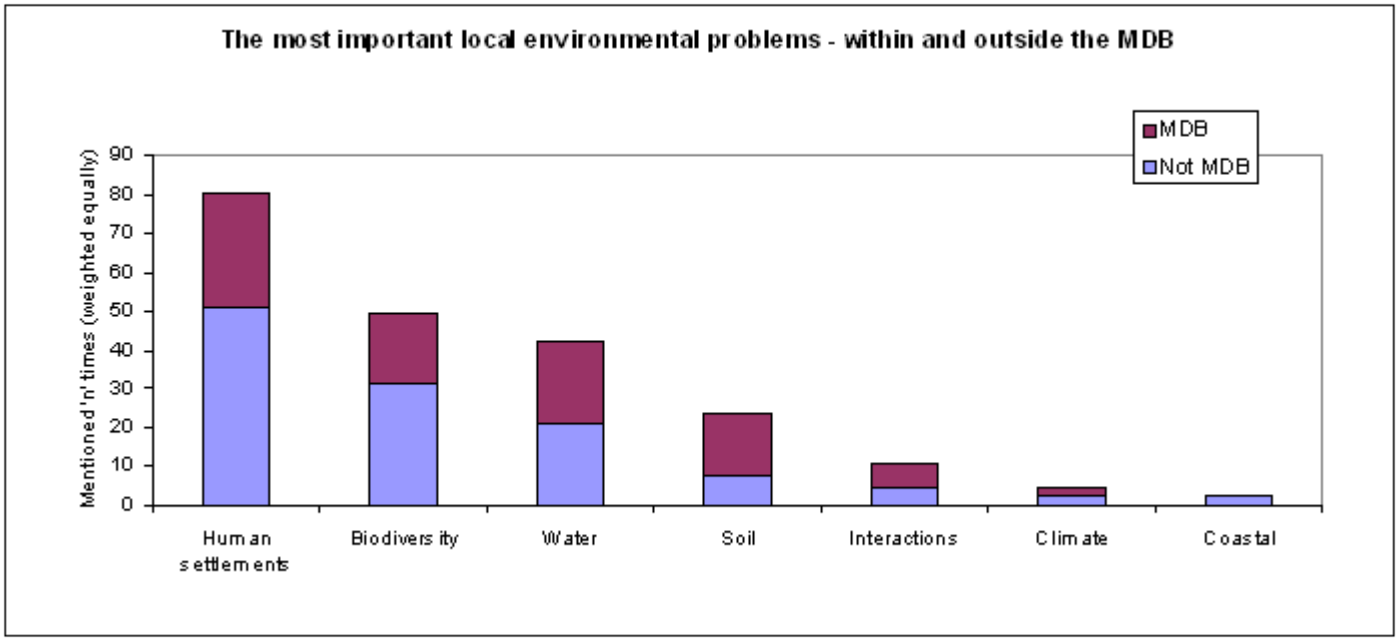

Figure 4 - Most important local environmental problems within and outside the Murray Darling Basin

The results in Figure 4 do suggest differences in perceptions of important local environmental problems based on whether or not an agency is within the MDB. Respondents outside of the MDB typically mentioned a greater range of environmental problems than those within, but this is weighted towards human settlements and biodiversity issues. Water problems were mentioned equally in each area, and soil problems were mentioned more within the basin than outside. There were too few responses in the category of climate to suggest any patterns.

From here on, this report describes the local perceptions of each of these important environmental problems. The distinction between perceptions from respondents within and outside the MDB is continued throughout.

Several subcategories are discussed for each of the four broad categories of environmental problems that were mentioned most often. Table 1 shows the broad categories, and lists the relevant subcategories for the four most commonly mentioned problems – human settlements, biodiversity, water and soil. The next four sections of this report each begin with a graph showing the relative importance of each subcategory, together with a table that highlights interesting issues raised in interviews within and outside of the MDB. The final three sections are similar, but do not identify further subcategories. Each section starts with two evocative and if possible, representative quotes that highlight important features of the important environmental problems – the first from within and the second from outside the MDB.

In the electronic version of this report, Table 1 contains hotlinks to the later sections, and the tables in those sections have hotlinks to all of the original quotes that contributed to the category. Note that many quotes appear more than once, because people often discussed more than one issue together.

Table 1 – Environmental problems and examples

Environmental problem	**Examples**
Human settlements	Knowledge-institutions, land use and tenure, sustainable agriculture, pollution and waste, finance, indigenous
Biodiversity	Weeds, native plants, feral animals, native animals, fire
Water	Quality, water generally, quantity, groundwater
Soil	Salinity, other
Climate	We have little understanding of the weather which affects everything
Coastal	Dunes and wildlife at risk

Human settlements

Figure 5 shows the subcategories that explain important environmental problems related to human settlements, and their relative importance based on how often each was mentioned during interviews. Table 2 gives examples of the sorts of issues that were raised when each problem was mentioned.

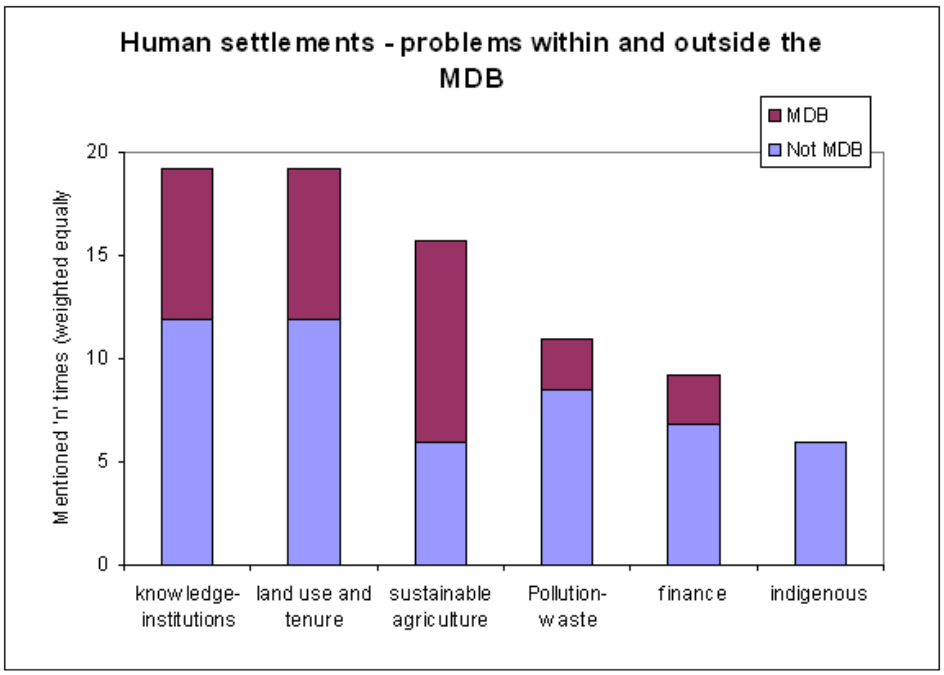

Figure 5 - Human settlements - problems within and outside the MDB

The two subcategories of knowledge/institutions and land use/tenure were mentioned equal most. Both were mentioned more than twice as often outside as within the MDB. Only the problem of sustainable agriculture was mentioned more within than outside the MDB. Indigenous issues were only mentioned by respondents outside of the MDB, but this does not suggest that those issues are unimportant within the MDB. It is more likely because no indigenous agencies were approached for interviews within the MDB, but they were in some of the places outside – especially within the Northern Territory. It is also probably because indigenous populations are lower relative to non-indigenous populations in the regions of the MDB that interviews were carried out, but are a much more significant proportion of the populations in other areas where this research was carried out.

Table 2 – Human Settlements

	Murray Darling Basin	**Other**
Knowledge-institutions	Scientific data, education, audit information, news service, reports, GIS	Attitudes, understandings, learn from the past, training, education management plans, laws, gazetting, compromise, agreements, boundaries, amalgamations.
Land use and tenure	Building houses, native vegetation on private land, land clearing, development pressure.	Maintaining weed eradication on public land, space for essential services, joint management, absentee landholders, history, development strategy.
Sustainable agriculture	Plantations, fertilisers, raising awareness, moonscape improvements, depleted fertility, farming practices, management, trees.	Water for horticulture, wet seasons, degraded pastures, mustering by fire, weeding fenced-off areas.

	Murray Darling Basin	Other
Pollution-waste	Tyre disposal, recycling, waste from campsites.	Sewage, litter and garden waste, plastic bags, waste management facility on the river, leachate to groundwater, pesticides, herbicides. Contamination.
Finance	Not enough allocated funds getting through, trade-offs.	Tax, incentives, funding, money being wasted, not available when and where it is needed.
Indigenous	No records	There is a need for better cooperation and more land within indigenous LGs. Also an interest in more information about native plants to help with selling arts and crafts.

It was quite surprising that human settlements issues were most often mentioned as the most serious local environmental issues. As the interviewer, I was expecting that the question itself would push respondents towards reporting biophysical issues, since people generally need reminding that environmental issues include the human factor. This should be taken as strong evidence that local and regional practitioners across rural Australia place a high priority on fixing the human aspects of environmental problems.

Knowledge-institutions

> "The lack of good long-term scientific data is our biggest issue. A big constraint in managing the environment is not having a good understanding of it, particularly when it comes to things like groundwater and salinity. This area will have dryland salinity by 2020 but no-one has mapped the groundwater, so no-one really knows. There is no good research to back up the assumptions. Its good that we are made aware of it, and that it might be an issue, but I am not convinced that it's as big an issue as people are saying." *Southern Queensland Regional Facilitator*.

> "The environmental challenge that we face is to build the capacity of institutions and people to address those challenges that we face. When you get those people from state agencies, totally preoccupied with monitoring water quality, and not undertaking any research to change the attitudes and understandings of people who are causing the problems in the first place, then you are not doing anything." *Northern Queensland Regional NRM Agency Chair*

A wide range of institutional and knowledge problems were mentioned as serious environmental problems. Lack of suitable institutional structures, and their failure to work adequately together were the most common problems. The big knowledge problems were failure to learn over time through long-term monitoring, or big information gaps because important issues have never been studied at all. Groundwater resources for instance were frequently described as being poorly understood.

These quotes also deal with failure in the complex interplay between institutional, statutory and learning capacity, with respondents describing situations in this interplay inhibits the achievement

of beneficial NRM outcomes. There were also descriptions of improvements to these processes, or positive aspects. They included good educational opportunities and improvements to institutional frameworks due to new structures for regional delivery structures for NRM support.

The main difference between responses from within and outside the MDB was that those outside talked more of flawed institutional structures, whereas shortfalls in good scientific data dominated the comments from within the basin.

Land use and tenure

> "Land clearing for development is an important problem. Obviously, our planning department in the shire is very strong on vegetation clearance. If people over-clear without approval we really get onto them very strongly. On the one hand we are encouraging development, but we are also trying to get a balance. We don't want to make the little towns become like a suburban town. Most of the valley floor is in private lands. We are trying to establish tight controls so that we don't destroy the very characteristics that make it attractive to people." *Western Victorian LG group*

> "the NT government delivered a land use planning scheme for the next 20 years, and they didn't include extra new sites for the landfill or the STP. The Landcare Association wrote a letter to the government saying that they would need a better site for the plants but it wasn't provided. Council will really need to work with the indigenous LG on these issues or it will be in really big trouble." *Northern Territory LG Group*

LGs have many good reasons to restrict their activities to land areas that they are directly responsible for. They have a severely limited resource base, including very limited money to do essential work. There are also very low levels of statutory capacity even to support their core business, let alone embark on politically risky initiatives such as using planning laws to restrict degradation such as native vegetation clearing on private land – as in the first quote above (see the resources report for more on this).

Many of the comments coded here are about LGs being expected to take care of NRM issues that are either not on their land, or that originate nearby, and then move onto LG land. Examples include weeds and water pollution problems. There are several quotes about weeds moving from state government or private land, onto LG land, and the LGs being expected to clean up their areas, while seeing them re-infested every other year due to poor management by their neighbours.

Another example is highlighted in the second quote above – when other spheres fail to provide the land or infrastructure needed for essential service provision. LGs often end up being responsible for service provision, even when the basic resources needed for those services are unavailable. LGs are rightly concerned that long-term environmental harm might result if their only option is to use inappropriate land and water resources in providing basic services. One example from the Northern Territory is concern about continuing to use old landfills that might connect to unmapped groundwater resources, which in turn might be connected to significant drinking water aquifers.

The main difference between comments from within and outside the MDB is that those originating within talk of shifts from one type of land use to another. Those outside the MDB talk more often

about currently undeveloped land being developed for the first time. This is particularly the case in the Northern Territory.

Sustainable agriculture

> "Salinity is a big problem, both dryland and in the irrigation areas. But this is improving because of better understandings of why and how to turn it around. Erosion problems are fairly significant, but again, there has been some fantastic work. Some people have used the funding they could access to really turn it around, and show that it is not something that is here to stay. You can really see the improvements. I have read a report saying that this area was a doomed moonscape. But there have been some really positive changes, and I think there is a real future in this area. The farming sector is effectively improving environmental values." *Western Victorian LG Group*

> "When I was in the north, there was this pastoralist there who really just has a dirt farm, but he musters by fire. He said it was to keep down the spinifex. I tried to stop him from doing it. This push by the pastoralists that they know the land, and they know the way to manage it better than anyone else is crap. All that I have seen so far is they want to get the most out of it. They will tell you that they manage it for sustainability but they don't. There is so little rainfall up here that they can't do the rotations and things that they say they are doing." *Western Australian Regional Agency CEO*

There is a degree of guarded optimism among some responses that talk about sustainable agriculture. Many respondents feel that they are on the right track with tackling dryland salinity, erosion, water wastage and other historical problems – as in the first quote. But there are enduring concerns about water simply not being available, or farmers failing to think ahead to the long-term impacts of their present-day practices – as in the second quote above.

Within the MDB there was often a sense that land was 'tired', and had been over-used for decades. Productivity was assessed as being eroded because of the long-term impacts of farming in these areas. This sense of having already over-used the inherent natural resource capacity of land was less apparent in other areas.

Pollution-waste

> "I have to say that the problem is the disposal of tyres. From an urban area perspective, recycling generally. We do recycling but I am not convinced that it is viable." *Southern Queensland LG Manager*

Sewage, waste, rubbish, and the resulting contamination of soil and water are the key issues here. One of the key differences between the MDB and other areas is that the tropical north experiences more regular flooding, where rivers and other waterways break their banks. There is more of a concern in these areas that contamination could spread uncontrollably along with the water during flood times.

Finance

> "With agricultural tradeoffs they say 'it's hard to be green when you are in the red', and that has been the attitude through the drought. Environmental work seems to be something that occurs when there is a bit of extra money around. When people are struggling to pay debt, feed their cows or their kids, then fencing off areas and planting is the last thing on their minds." *Eastern Victorian LG Group.*

"We can't tax all of the people that drive along our roads. But is it reasonable that the ratepayers here exclusively pay for all of the gravel roads, when other people come here to go skiing, fishing and bushwalking? They use the roads, they damage the roads, they use the water that flows out of this municipality. You almost need the old village model where the chimney sweep buys his tomatoes from the guy down the road. The recognition of interdependence is being reduced." *Tasmanian LG Chief Executive Officer*

The key issues here are either a lack of available money for improving NRM, or a need to trade-off agriculture against environment. A lot more was said about lack of finance outside of the MDB than within. There is a strong sense that the allocated NRM money is not available quickly enough, or with sufficient flexibility to cost-effectively drive the most important NRM solutions. LGs' capacity to raise funds through other means than rates and the unreliable NRM funding opportunities is also constrained – as stated in the second quote.

Indigenous

"I think the new Aboriginal LG nearby is struggling, but I think we are being a bit remiss about that. I think we should be having some cooperating and sharing resources, but we have become the hole in the donut with no resources. I certainly want to try. There are parts of the territory that should be in the Aboriginal LG, but

aren't. And there are others that should be part of our council too." *Northern Territory LG Mayor.*

Indigenous issues were only mentioned outside of the MDB. As was mentioned above, this is most likely because indigenous agencies were not targeted for interviews within the MDB. There are many indigenous NRM issues currently being addressed within the MDB but readers will need to look elsewhere for insights into these.

Most of the statements coded here expressed concern that the wide range of general challenges that face indigenous communities, also mitigate those communities capacity to achieve good NRM. Social problems, a lack of available resources for essential services, ongoing struggles with lack of land rights or poor relationships with racist neighbours all featured as constraints to effective indigenous NRM. The new arrangements for indigenous local governance that are currently being trialled in the Northern Territory are among the most optimistic examples. But basic capacity building is still needed in these areas, as are good partnerships with neighbouring non-indigenous LGs and regional agencies.

Biodiversity

Figure 6 shows the relative importance of five subcategories that help to explain the NRM problems that local and regional practitioners face in managing biodiversity resources. Flora issues appear to be of more concern to local and regional practitioners, with weeds mentioned most often, followed by native plants, then feral animals and native animals. Weeds and native animals were each mentioned about four times as frequently with the MDB as outside of it. Fire was only mentioned outside of the MDB, and not as frequently as the other issues listed here.

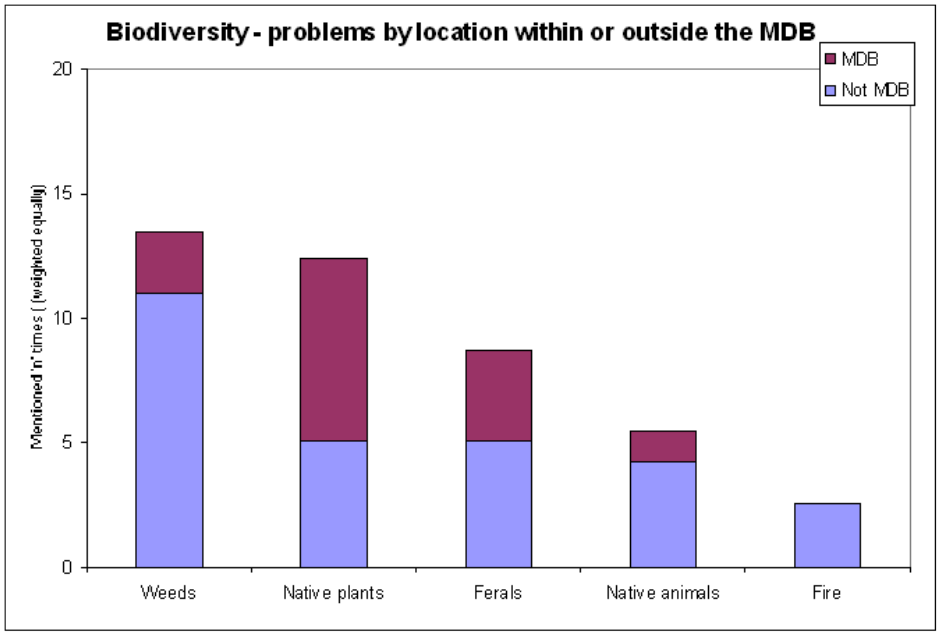

Figure 6 - Biodiversity problems by location within or outside the MDB

Table 3 – Biodiversity

Biodiversity	Murray Darling Basin	Other
Weeds	Not enough money, buck passing between state and LG, country not producing like it used to.	Lagoon choking over with weeds, need for a unified, collaborative approach to noticeably stop them spreading.
Native plants	Conservation, decline, need to balance conflicting issues, challenges to vegetation management.	Loss of native vegetation, dieback, clearance, fragmentation.
feral animals	Some controls effective, eg fox baiting, carp control.	Cane toads, buffalo, feral animals. Non-strategic management that helps weeds.
Native animals	Things are starting to turn around.	Native animals have certain rights, biodiversity decline.
Fire	No records.	Attitudes to fire differ from down south. Not enough money to make the gazetted roads.

Weeds

"There is too much buck passing, and the government opts out. Highway weeds are an example. It is easier for the state government to ignore than it is for local government. There is no statutory requirement for either sphere to do it, but local government fixes it because it is a local priority." *Southern New South Wales LG Group*

"The pastoralists are only treating the weeds on their properties where the maximum benefit can be received for the least work. The environmental ways of dealing with

> Parkinsonia are clear you start upstream and move down. You don't spend a cent at the mouth of the river until you have treated it at the source. But because it will take so long in this case, the political pressure suggests doing something down the bottom. What should occur is both the pastoralists run broad things in the bottom, getting the weeds out, but we need to work on both ends at the same tome. Only Caltrop that stick to the fur of horses and cattle and donkeys will move upstream, but the others only move downstream." *Northern Territory LG Indigenous LG Environmental Manager*

Weeds are increasingly being recognised as a critical and urgent NRM issue for Australia – especially in northern areas. Another Resilience report focuses on LG and weeds, and reflects on comments made about weeds across all of the survey data that was collected for this research. Some major lessons are that current weed initiatives are largely ineffective at actually reducing the weed problem, that the importance of weed problems differ by state, and that LGs get left with an implicit responsibility for tackling weeds issues even if they have severe constraints on their statutory authority and financial capacity to do so.

Both within and outside the basin, respondents talk of not having enough money to control weeds. This is especially the case for weeds that are not among the 20 species that have been declared 'weeds of national significance', or the other relatively small set that have been listed as significant in state or territory legislation. Local practitioners who report weed problems frequently explain that their own shire has only a couple of these types of weeds for whose control there is external funding available. Most of the weeds present within any individual local area are not included on those lists, and LGs themselves need to find funds to deal with the weeds. It is even more difficult when there is disagreement about whether a particular species is a weed. Many of the worst environmental weeds are still being planted by pastoralists as fodder crops. The controls that do exist focus on agricultural, or economic weeds, and not environmental weeds.

Native plants

> "The biggest problem is native vegetation decline, because we are still the tree clearing capital of the country at the moment and a lot of native vegetation has been removed in the last few years. The Brigalow has a big salinity hazard potential, so vegetation clearing has a domino effect to a lot of other issues soil erosion, salinity. *Northern New South Wales Regional NRM Officer*

> "We used to be able to go out and pick lovely bunches of wildflowers. Those flowers don't come out any more like that." *Western Australian indigenous community member*.

The main concern being expressed in relation to native vegetation is the potential to lose remnant ecosystems or vegetation types entirely from some local areas. In some places the few remaining remnants are on private lands, or native vegetation is still declining despite controls and programs to prevent that decline. Sorrow is expressed at the loss of valued vegetation types such as wildflowers and large trees.

Feral animals

> "Fox baiting is working well. So we like the fox fact sheet [within the *Resilience* Outside Information], but might not need it. *Southern New South Wales LG Group*

> "We might have a bit of a pig problem in the Shire's major river. There will be a cane toad problem everywhere, and there are cats as well. But we don't treat them as a council problem." *Northern Territory LG Group.*

As is suggested in the second quote, feral animal animal control is not always taken on as a LG management issue – even if it is seen as significant in the local area. As with weeds, there are limited funds to draw on to tackle feral animal animal problems. But unlike weeds – feral animal animals are mobile, and therefore not constantly visible or present within local areas. This makes it more possible for LGs to do what they report other spheres of government doing in relation to other NRM problems – not taking action to manage problems even when they are increasing.

A similarity in the challenges of managing weeds and feral animals is the challenge of achieving consensus in identifying pest species. Pigs, buffalo, horses and others are among the species that are seen by some as pests, but valued as resources by others – making their management by any sphere of government difficult. There are some species that are universally recognised as pest animals – with cane toads being most commonly mentioned in this study. At the time of the interviews, local people from the Darwin and Katherine region were sadly anticipating their arrival, which has occurred since, to the the predicted detriment of many native animal species.

Native animals

> "I used to live on the Exmouth Cape, and watch people in 4WDs on the beach. I saw someone drive straight through a turtle's nest. Locals seem to think that they should have the right to do anything here because they live here." *Western Australian coast, state government regional agency Chief Executive Officer.*

> "we are starting to catch more and more native fish in the Broken River. We caught 50 native cod (which we released again) during an annual fishing meet this year. Things are starting to turn around, and that's for a range of things, including us cleaning up our stormwater runoff. The CMA is also looking at fencing off a lot of the major tributaries to the rivers. And with all of that, hopefully we will get back to something like what I have seen in the past." *Eastern Victorian LG environmental manager.*

> "Another problem is bats. The problem is that bats are native animals, and as such they have certain rights. But they occupy the town. So you have this conflict between the built environment and the natural environment... As well as the bats, we have the crocodiles, which have gotten more populous, and also bigger. Swimming in water holes becomes more dangerous. We have had some dogs taken. There is this conflict between natural and man-made estates. *Northern Territory LG Group.*

As with the decline of native plants, there is sorrow in some accounts of threats to some native animals. There are also some happy reports of success in recovering certain species – as in the native cod that are described as being increasingly abundant in the second quote.

Fire

> "Bushfire people say that you have to put in a boundary firebreak. Many people don't burn at the right time, and burn properly for the firebreak. Here you must have a firebreak, whereas it is not mandatory down south. A fellow living on the edge of a big subdivision complained that he had his fences cut by fire fighters, and I said they are allowed to do that. His point was that it was needed because we didn't have a good firebreak around the road that is gazetted there." *Northern Territory LG Group.*

As was stated above, fire was only mentioned outside of the MDB. The main issue being reported here is of changed fire regimes due to increased active burning or weed infestations. The quote above reports a difficulty faced by LGs in tackling fires, when they don't have the funds to build their gazetted roads. This restricts access and can threaten infrastructure or other landscape values.

Water

Figure 7 shows the four subcategories that explain the water problems that were mentioned in these interviews. These are water quality, water generally, water quantity and ground water. Groundwater problems were the only set of problems mentioned more frequently within than outside of the MDB, and water quality issues were mentioned equally within as outside that basin.

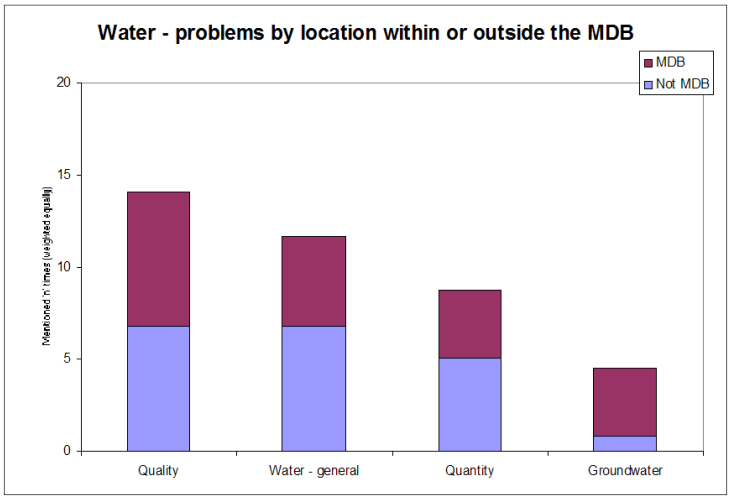

Figure 7 - Water - problems by MDB

Table 4 – Water

Water	Murray Darling Basin	Other
Quality	Improving water quality linked to other environmental improvements.	Community dumps and aquifers. Absentee landholders. Contamination. Good management upstream makes downstream use possible.
Water general	Re-use, rights, water generally.	Water for development.
Quantity	Trade-offs for water supply, availability of water will change the face of society here.	Problems with low-flow rivers. Demand and impacts of dams.

Water	Murray Darling Basin	Other
Groundwater	Incomplete mapping.	Community dumps near unmapped aquifers.

Quality

> "Water quality and river health are major issues but I think we have got a handle on them, and I have a real sense of confidence that we have a handle on it, and politically it's a big ticket item, and there's buckets of money for it." *Victorian Regional NRM Manager.*

> "Water quality. Generally it hasn't surfaced a lot, but it will very soon, because lots of the blocks in this shire are being bought by absentee landholders. And as they move onto the blocks, they will they use fertilizer or pesticides. See the water networks here. They cover the whole landscape, so any of these chemicals will go just about anywhere." *Northern Territory LG Group.*

There is a marked difference between respondents within and outside the MDB when it comes to describing water quality problems. Within the basin there is a strong sense of optimism that these problems are fairly well understood and being successfully addressed. This view is not universal among the quotes, but was expressed more often than was a sense of declining water quality.

Only once was this positive sentiment of improving water quality expressed outside of the MDB. That was in Tasmania, where agriculture and water management also has a long history, and the Landcare movement has helped to turn around a decline. In the Northern Territory, and in other areas where agricultural endeavours are comparatively new and development is speeding up, current and future decline in water quality is commonly described.

Water general

> "Council does re-use water on the golf course, rather than putting it down the river, and that's been a real success." *Southern New South Wales LG Group*

> "The water both above and below ground is a problem. There needs to be more national research done for areas like us at the edge of the outback deserts. There needs to be the ability to treat saline bore water for above ground use whether for irrigation or woodlots or whatever." *South Australian LG Environmental Manager*.

This category of water more generally covers a fairly wide range of issues, none of which were mentioned often or consistently enough to justify a whole analytical category in this report. Water use and water treatment are both represented in the above quotes. Other issues include stormwater management, flood management, water rights, integrated catchment management and access to water and waterways. For most of these issues, the sentiment being expressed is concern at problems being encountered rather than confidence about successes that have been achieved.

Quantity

> "I applaud the Australian Government's approach to trying to secure water for environmental flows. I think that the availability of water has the ability to change the whole face of our society in these areas. As water gets more expensive, farming practices will need to change." *Eastern Victorian LG environmental manager.*

> "Potential over-allocation of water. Everything is relative even the amount of water that we have available. It is not over-allocated yet, but if this area is advertised to southerners as having endless water then people will come expecting that." *Northern Territory Regional NRM agency officer.*

Within the MDB, as with water quality, there is a high degree of confidence at improved management of water availability, or quantity being expressed here, the first of these two quotes. Policy makers would surely be reassured to see that LG practitioners are so ready to see the big picture benefits of these initiatives, rather than being focused on possible local backlashes to heightened controls on water usage. There seems to be an increasing general awareness that scarce water resources need management for both environmental and agricultural values, and an appreciation that changes to agriculture are necessary to address this. These views are expressed most often within the MDB, where basin-wide initiatives to recover environmental flows are now well established.

Outside of the MDB, there is concern that the lessons from that basin may not have been learned in time in other places. In areas where water quantity management has a shorter history, or where water is still being marketed as an abundant resource, there is concern that future costs may be incurred due to a reluctance to apply controls now.

Groundwater

> "If we didn't have the ground water here there would be no-one here, so it's important." *South Australian LG Chief Executive Officer.*

> "My main focus at the moment is on community dumps and the contamination of the aquifers that the bores come out of. Our community has dumps within 100m of bores in some cases. These are unlined dumps, so leachate including motor oils and car batteries (with heavy metals) are serious contaminants there." *Northern Territory Indigenous LG environmental manager.*

Groundwater availability and quantity were both mentioned as important local environmental problems. In both cases, concern rather than optimism was the dominant sentiment.

Soil

Figure 8 shows the two subcategories of soil that were mentioned in interviews as important local environmental problems. Dryland salinity was by far the most commonly mentioned issue, accounting for three-quarters of the responses about soil problems. In both cases, soil problems were mentioned more often within than outside of the MDB.

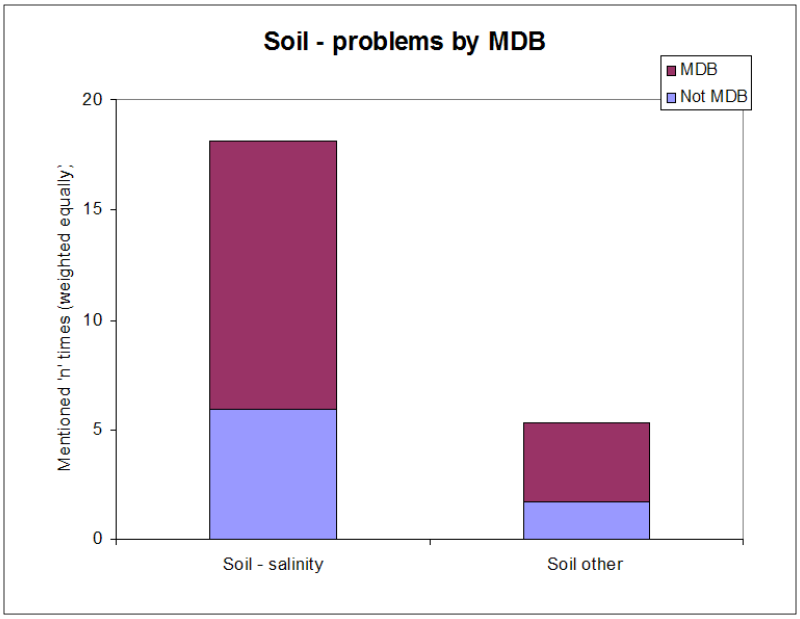

Figure 8 - Soil - problems by MDB

Table 5 – Soil

	Murray Darling Basin	Other
Salinity	Longstanding knowledge of issues and improvements being made.	Salinity inter-related with other problems.
Soil other	Degradation, erosion, wind, water.	Erosion, depending on revegetation and wet season, soil decline from agriculture.

Salinity

> "In a previous role I got to do a bit of work on salinity, and recharge areas. It blew my mind that there was so much information around, and so I put it in the scheme. It became a bit of a hassle with triggering approvals and things, but it was very useful once it got into the scheme. Everyone in council could use it" Eastern Victorian LG Planner

> "I saw the Darling collapse as a kid, and parts of Western Australia. In three generations they have lost it to salt." *Northern Territory Government manager*

In recent years, the National Action Plan for Salinity and Water Quality has run a major initiative to tackle these important problems. The success of the initiative in raising awareness about the nature of this NRM problem, and strategies to address it are evident in the comments that are recorded here. In most cases, people say that they have enough information about salinity, although at a local scale, the exact location of salinity hazards often remains unclear. Respondents often claim to be managing the problem effectively, or at least, to be tackling it with confidence.

Several respondents express less than total satisfaction with the National Action Plan for Salinity and Water Quality. Concerns include that hazard maps have devalued land in the local area, that

the issue is less significant than claimed, or that it is over-emphasised in relation to other important environmental issues.

There were no outstanding differences between the responses made from within the MDB and those from outside.

Soil Other

> "Soil degradation and soil erosion are important problems. Soil degradation is a result of over-cropping. Straight out soil erosion comes mainly from water, but also from wind." *Western Victorian LG Mayor.*

> "We have soil decline due to agriculture, and wind and water erosion. Then there is herbicide and pesticide resistance that is going to have a big impact on this region. It could mean that the agricultural systems fail in their current form, and would return to their old forms and there would be more erosion." *Western Australian Wheatbelt Regional NRM Agency manager.*

Besides dryland salinity, the major soil issues mentioned by respondents were erosion and the depletion of soil fertility. Both were often closely associated with salinity, being mentioned alongside them, usually in association with the removal of trees and other native vegetation.

Although other soil problems were mentioned more often within than outside the MDB, there was no apparent difference in the type of issues that were highlighted.

Climate

Climate issues are attracting considerable attention in international and national research and NRM policy implementation arenas. But they were very rarely mentioned as important local environmental issues in these rural parts of Australia facing multiple, serious NRM problems. Recall from Figure 2 that climate problems were identified from outside, but not mentioned by insiders in 80 per cent of the local areas surveyed. These results suggest that climate issues are not yet recognised as clear and pressing problems, even when they are.

Table 6 – Climate

	Murray Darling Basin	**Other**
Climate	Climate change is poorly understood. The droughts continue.	The weather affects everything. We haven't had a wet season for years.

> "The other sleeper issue is climate change. I don't think we are remotely close to having our heads around that. We have a coordinated news service within the department and it cuts and pastes articles from across all of the press. One article today is about how climate change is nothing to worry about, that its part of the standard world we live in. That drove home that we are nowhere near understanding it." *Victorian Regional NRM Agency manager*
>
> "The weather. Because it affects everything. We did a big tree planting thing earlier this year, and because it didn't rain, 40% of them died. It was hard to get the application up and the funding, and then it didn't work well." *Western Australian Wheatbelt LG Group.*

It makes sense that the times that climate was mentioned, there was a high degree of uncertainty about how climate and climate change may affect other NRM issues. It also makes sense that no-one who mentioned climate issues had any confidence that they could improve, or even manage climate issues. These factors, as well as the low level of local attention to climate issues set it apart from the other NRM problems. If researchers or the policy community want local and regional agencies in rural Australia to take action to address climate problems, then more work is needed to actively educate and engage them in appropriate actions.

Coastal

Table 7 gives a snapshot of two issues that were raised in interviews as important coastal NRM problems. No coastal issues were mentioned by LGs within the MDB – despite the only coastal MDB council being among those interviewed. The fact that coastal issues were mentioned rarely in other interviews does not suggest that these are unimportant. In fact, the current 'sea change' movement is creating major problems for the LGs that are receiving massive influxes of new residents. The few statements that were recorded about coastal issues mainly reflects the very few LGs interviewed in coastal areas.

Table 7 Coastal

	Murray Darling Basin	**Other**
Coasts	No records.	Dunes, wildlife at risk.

> "What the state has done now is to come up with a development strategy for the whole coastal area. The principle is really good, to look at that broad area. That's very sound. How do you manage that whole area, and access to the coast so that it is sustainable. Within that there are a million different issues, but to pose the big question of how we manage this coast so that it is sustainable, but still accessible is a good one to look at. " *Western Australian Coastal LG Chief Executive Officer.*

The main comment that can be made about the times that coastal issues were mentioned is that as with climate, there was little confidence that coastal problems were being adequately addressed.

Chapter 4: The foundations of resilient communities

Resilience – inside-out report 4

By Dr Su Wild River,

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> "The people give us resilience. The committed people who are passionate about the environment. The plans that are being developed to hopefully prevent environmental degradation help, as does having contingency plans if problems occur. I think that the seasons in the this regions and the fact that we do have a wet and a dry season help with resilience. If water is over allocated in the dry, there will still be water in the wet. Understanding the seasons could help the resilience of the land because that can tell us when to do something – like cleaning up weeds at particular times depending on the wet and dry seasons." *Northern Territory Regional NRM manager*

Executive summary

Resilience is the process of adapting well in the face of adversity threats, or stress. It means "bouncing back" from difficult experiences. Resilience is needed as natural resources degrade. Resilience can be learned and this project aims to help rural local governments (LGs) to learn it, and other spheres to help.

Resilience focuses on those regions of Australia that face serious, multiple natural resource management (NRM) challenges. This report focuses on the features of those regions and local areas that give them the capacity for resilience. NRM practitioners in these places identify the following aspects of their local areas as providing the foundation and capacity for resilience:

- leadership;
- knowledge;
- people;
- environmental features;
- diversity;
- development;
- cooperative efforts;
- commitment; and
- money.

The contribution of each of these aspects to achieving resilience are varied at present. Three sources of variation are:

- the location of communities, and whether they are within or outside of the Murray Darling Basin (MDB), thus have had less or more prolonged exposure to regional NRM initiatives. Practitioners outside of the MDB each report a greater number of contributing aspects, and are more focused on environmental features and diversity than are those within the MDB;

- the point of view of those reporting on the aspects, and whether they have an inside perspective, resulting from a detailed understanding of their local area, or a facilitating perspective with an understanding of both local and broader issues. Facilitators each report a greater number of contributing aspects, and are more likely to identify leadership, knowledge, people and cooperative efforts as key aspects than are those whose main understanding is of the local area;

- the degree of effectiveness achieved through each aspect. Leadership, people, environmental features and cooperative efforts are most often reported as effective in achieving resilience, while constrained resilience is often reported due to a lack of knowledge or development opportunities.

An executive summary of all key findings from *Resilience* and detailed project methods are all available as separate, linked documents, along with the remaining 'inside-out reports'.

Background to the resilience report

Resilience is a Land & Water Australia project aiming to enhance rural local government capacity in NRM. Its focus is on enhancing the understanding that different spheres of government have of one another generally, and of NRM efforts in particular. *Resilience* is working with 28 local governments – four from each state. All participating LGs face serious, multiple NRM challenges, and have mixed levels of prior engagement in regional, state and national NRM initiatives.

The concept of *resilience* was chosen as the title for the project because of the serious NRM challenges faced by all participating lcoal governments (LGs). These challenges were identified through maps produced by the National Land and Water Resources Audit (the Audit) and include pressures on local water, land, biodiversity, climate and human settlements resources. Figure 1 is a map showing the LG areas within Australia that were identified through the Audit's outputs as facing these multiple NRM challenges.

Australia NRM map

As the project's principal investigator, I thought at the outset that I would encounter clear and present signs of threats to and from environmental values at each of the local places I visited for the project. This was not the case. Many of the selected areas are within Australia's most productive

agricultural regions. Crops such as wheat, sugar and cotton stretch from horizon to horizon in these places, suggesting abundant natural resource opportunities. Many of the local towns have a sense of activity and wealth. It is only when you look for the trade-offs that the NRM pressures are apparent. Riparian zones are often non-existent, weeds are taking over, water quality is clearly degraded and soil erosion is prevalent. The wealth in the towns was sometimes old wealth, and grand old houses are for sale at depressingly low prices.

These challenges to sustainability were understood by the NRM officials who took part in *Resilience* interviews. They were also well aware of the aspects of their local areas that had enabled them to survive until now, and looked set to carry them into a respectable or prosperous future. The survey question that tapped into this knowledge was at the end of the interviews – after trust was well established, and NRM challenges and initiatives had been discussed in detail. The question that was posed to draw out the responses that are reported here was:

> Resilience is the process of adapting well in the face of adversity, threats or stress. It means bouncing back from difficult situations. Resilience is needed as natural resources degrade. What aspects of this place will help it to survive the impacts of resource degradation?

The results were coded according to two dimensions. The first describes the aspect of places that could help them to survive resource degradation. The second noted the effectiveness of that aspect in achieving resilience. Two of the core LG analytical themes that are explored throughout *Resilience* were also used in data analysis. They were the *perspective* of respondents and whether those respondents were located within or outside the Murray Darling Basin (MDB). The next section reports on overall, integrated results from this analysis.

Integrated results

This section aims to paint a comprehensive picture of the range of responses that practitioners gave in applying the concept of resilience to their local areas. It focuses on the relationship between the nine aspects of resilience that these people identified, and the other variables that help to explain the identification of each aspect by any individual. After this section, there is a detailed discussion of each of the nine aspects of resilience in turn.

One apparent source of variation in reporting of aspects of resilience was between practitioners working within and outside of the MDB. This explanatory variable is used in *Resilience* to show differences due to the presence of very long-term, regional NRM programs. Regional arrangements for NRM have been present for decades within the MDB, and have typically been transformed into the Natural Heritage Trust regions through current initiatives (see LG analytical themes report). The results for aspects of resilience by MDB are shown in Figure 2.

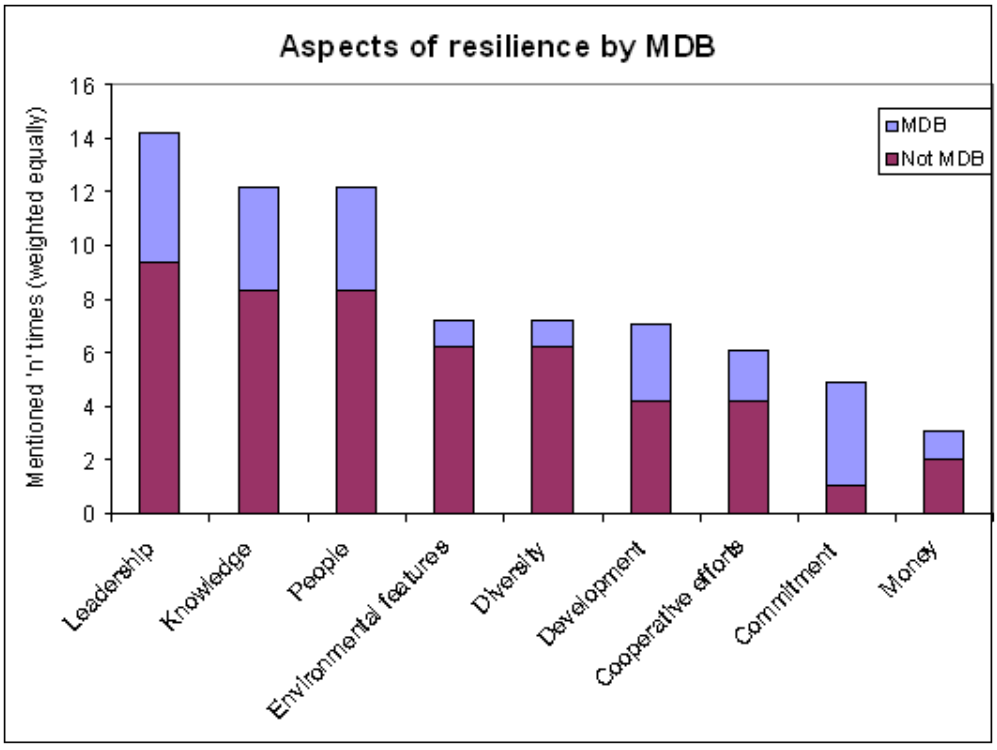

Figure 2 – Aspects of resilience by MDB

Three points are worth noting from Figure 2. First, there are about twice as many responses per interviewee from outside of the MDB than within. Second, two aspects of resilience were mentioned more than six times as often outside of the MDB and these were *environmental features* and *diversity*. This suggests that these features are somehow more apparent or noteworthy in influencing resilience in those areas of Australia where regionally coordinated NRM programs are newer. Third, the only aspect of resilience that was noted more often within the MDB than outside

was *commitment*. It makes intuitive sense that 'the political and personal will and intention to achieve NRM outcomes, including the support of council the community and/or a relevant plan or policy' is notable in those parts of Australia with the longest-term regional NRM programs in place.

A second apparent source of different reporting of aspects of resilience was due to the perspective held by a practitioner. There are three main perspectives:

Facilitating: Having a conceptual framework that accepts both other perspectives. Derived from work experience in LG Associations, or with both LG and another sphere of government, including a regional organisation or a regional office of a state agency.

Inside: Seeing LG environmental issues from a local perspective. Derived from having worked in LG and no other sphere of government.

Outside: Seeing LG environmental issues from a broader perspective. Derived from having worked in regional, state or federal government agencies, but not in LG (see LG analytical themes).

Only two people with outside perspectives were interviewed for Resilience, and roughly even numbers of both insiders and faciliators. The results for the interview question on foundations of resilience communities are shown (weighted equally) for inside and facilitating perspectives.

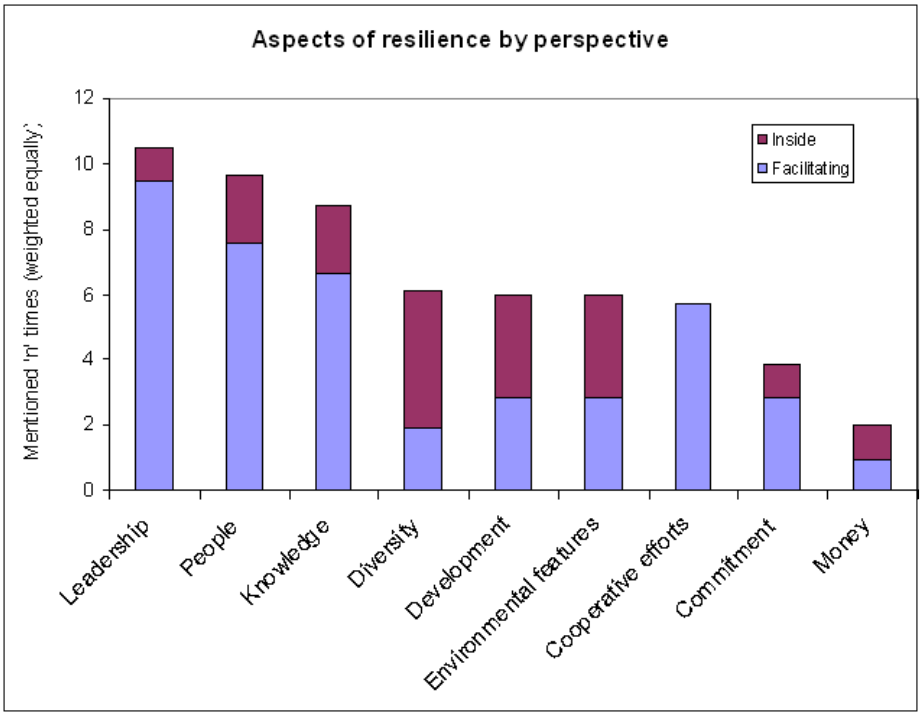

Figure 3 - Aspects of resilience by perspective

Figure 3 shows that facilitators are far more likely than others to identify leadership, knowledge and people as driving resilience in the local areas than are those with inside perspectives. Facilitators were also the only group to mention the importance of cooperative efforts. People with inside perspectives were more likely to identify diversity, development and environmental features as drivers of resilience than were facilitators.

Figure 4 shows practitioner views on the effectiveness of each of these aspects of local places in driving resilience. *Environmental values* were the only aspect that was noted each time as being

effective in achieving resilience. The aspect that was most often reported as ineffective in achieving resilience was knowledge – or more specifically a lack of adequate knowledge to help achieve resilience.

This report now begins its detailed explanation of the effectiveness of different aspects of resilience that are shown in Figure 4. The earlier subsections below deal with aspects that were mentioned most often, while later sections report on those that were mentioned less. Table 1 – below the graph – gives a definition of the cross-cutting issues by summarising the common features of each quote counted within that section of the chart. The cells of the table also give links to the full set of quotes, so that readers can see what practitioners have said in relation to each of these aspects.

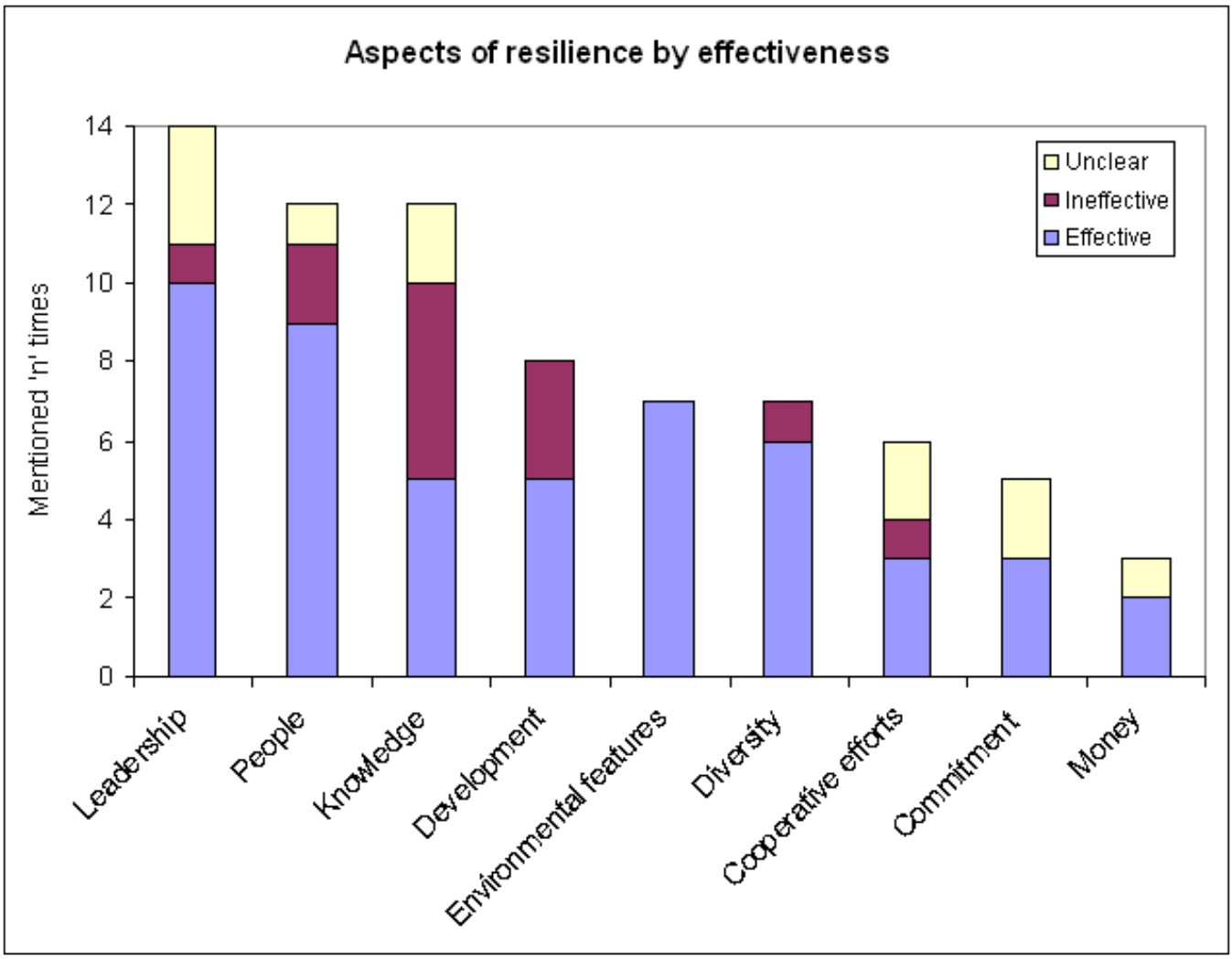

Figure 4 - Aspects of resilience by effectiveness

Table 1 – Definitions of aspects of resilience by effectiveness

	Effective	**Ineffective**	**Unclear**
Leadership	Successful guidance and direction of NRM initiatives	Unsuccessful or non-existent guidance and direction of NRM issues	A need for guidance and direction of NRM initiatives that may not have been filled
People	The presence and effectiveness of Knowledgeable and	The absence or ineffectiveness of knowledgeable and	Unreliability of presence or effectiveness of

	Effective	Ineffective	Unclear
	skilled people are within the community	skilled people exists within the community	knowledgeable and skilled people
Knowledge	People know how to proceed towards resilience	People don't know how to proceed towards resilience	It is not certain whether people know how to proceed towards resilience
Development	New opportunities for industry and agriculture are successfully explored and applied	Opportunities are missed for enhancing the industrial and agricultural base	It is not certain whether opportunities have been missed for enhancing the agricultural and industrial base
Environmental features	Conspicuous features of the local area help to achieve resilience	Conspicuous features of the local area constrain resilience	It is not certain whether conspicuous features of the local area help to achieve resilience
Diversity	Difference and variety within environments, industry and community drives resilience	A lack of difference and variety within environments, industry and community constrains resilience	It is not certain whether difference and variety are contributing to resilience
Cooperative efforts	Members of the community show a helpful willingness to work together towards resilience	Members of the community are unhelpful or unwilling to work together towards resilience	It is not certain whether members of the community are helpful or willing to work together towards resilience
Commitment	Will and intention to be resilient applied successfully	Unsuccessful application or lack of will and intention to achieve resilience	It is not certain whether will and intention for resilience are present
Money	Cash is available to achieve resilience	Cash is not available to achieve resilience	It is uncertain whether cash is available to achieve resilience.

LWA, ANU43. Resilience, Inside Information.

Leadership

> "Leadership. Real leadership – somewhere within the communities we need to find the right vehicle to lead the communities to get a better solution. I don't know if it is the catchment management associations – I don't know if they can fill that role. There is a role for LG. There it is a logical role for them to take on because the community looks to the council and the shire for information and leadership. And as we know the councils are a solid long term part of the community and have a real stake in making sure that the land is productive, because without productive land our communities will die." *Southern Queensland regional agency NRM facilitator*

The analytical category of *leadership* is defined as " the role of guiding and directing NRM initiatives".

LG is seen as playing a central leadership role – beyond that of the regional NRM agencies. This stems partly from LG's longevity. LGs have been present across Australia for over 150 years, and seem certain to remain. This sets them apart from regional NRM agencies which have been in place in their current forms for less than a decade, and are still establishing their fundamental roles. LG is also seen as an important leader because of its interdependence with communities. Unlike those in charge of regional NRM agencies, LG leaders are democratically elected and have daily interactions with those who have voted for and against them in elections. This requires courage and gives LG leaders a direct accountability to constituents.

Leadership was most often mentioned as an effective contributor to resilience, but uncertainty about leadership and ineffective leadership were also discussed. Respondents were not questioning LGs' implicit role as leaders. Instead, they raised doubts about LG's leadership role focused on the inherent difficulty of both understanding NRM problems and achieving real success in improving NRM outcomes.

There are some hints in these responses about what stimulates effective leadership. The emergence of problems encourages ingenious responses. Information can fuel leadership and enable clear goals to make it effective. Both ingenuity and knowledge can therefore encourage LGs to take initiative in NRM despite initial opposition, and follow through until successes are clear. This leadership would be undermined if information supplied to LG leaders is wrong, or initiatives fail to deliver outcomes within the three year political time-frames of LGs. To tackle really long-term NRM problems, LG leaders also need to be able to educate communities about the complex issues involved, so that commitment is not lost within an election cycle.

People

> "Ingenuity. Resilience itself. And also the state of mind. People in the bush have got a really easy-going nature. They don't let adversity get in their way. They will find solutions that won't be visible to others. The bigger issues also need to be focused, so we need to tackle those as well to ensure that we can deliver outcomes, and streamline projects and resource allocation and find the best bang for your buck." *Western Australian Wheatbelt LG, Chief Executive Officer*

The analytical category of *people* is defined as " knowledgeable, skilled people with regular, up-to-date connections with environmental issues and broader communities of experts. They may be LG councillors, officers, managers, community members and may work on either a local or regional basis, servicing several LGs".

People form a well-represented analytical category, also appearing in reports on resources and coordination. It seems that rural LGs and regional NRM agency operators have a strong recognition of the valuable input of local communities to achieving NRM outcomes.

Many respondents described people as key aspects of resilient communities. People were generally mentioned collectively, as members of communities working together against adversity. This included families, groups of farmers working together on Landcare and other coordinated efforts. The intelligence of people was also mentioned, including people's ability to respond to and recover from hardship by learning new lessons that they could apply to improve sustainability. Passion and commitment were also important as drivers of people's contributions to sustainability.

People were generally mentioned as effective contributors to resilience, with forces like hardship, and threats to sustainability seen as stimulating collective, community actions towards resilience. But at times, external pressures were also seen to divide communities and therefore constrain resilience. Extreme development pressure, fractured NRM agencies, the need to make money and population decline were all mentioned as forces that hinder a community's resilience.

Knowledge

> "There has been some great knowledge gained. Sometimes it has been promoted really well to the regions. Sometimes there is great knowledge owned by state government, but resilience will come from extending this good information, and knowledge out to people. There is some really good knowledge about new cropping systems, new varieties, new farming systems. There has been some good knowledge, and the visionary people that have that need to be supported in getting it out into practice." *South Australian Regional NRM agency officer*

The analytical category of *knowledge* is defined as " an understanding of how to proceed towards NRM outcomes, comprising both actions and the context in which they are performed".

Knowledge was the aspect of resilient communities that was most often described as ineffective. There was a recognition that NRM issues are complex and hard to understand, but also frustration about institutional constraints to learning. These were due to a lack of coordination between different planning initiatives, failure to monitor important environmental features such as groundwater and to monitor over time, use accurate data, or to take account of varied knowledge

systems such as indigenous wisdom. Respondents described risks associated with ineffective knowledge systems, such as their propensity to stimulate division within communities.

When knowledge was described as effective it generally involved a gradual build up of knowledge over a long time period, where that knowledge was shared throughout a broad community. Ongoing learning about complex NRM issues was frequently seen as the key to capacity building for resilient communities. Respondents recognised the inherent difficulty of understanding NRM conditions, changes and management options. Rather than suggesting that these issues be simplified for easy digestion, they recommended long-term approaches to enhancing knowledge.

Development

> "This Shire has been resilient because it has ignored all of the environmental issues and plodded along anyway. Because we have the lead smelters here, we have an employment base, and we have an economy happening in the town. While you have that economy, you could pull out every tree in the area and still have the town and the economy that will survive. We also have the agriculture as well, that gives us another plus. That is all economic resilience. Environmental resilience well I don't think it really is coming back very much. We still have a long way to go.

> The challenge is developing the ability to have accurate scientific information, provided to and understood by the local farming community in particular, that can then be tested for accuracy (eg the rainfall stats) to identify niche areas that can achieve sustainable diverse development in a fragile area. Also to say yes, carefully, in

particular areas, to new industries. I love seeing people still living in communities and feeling part of the community." *South Australian LG Environmental manager.*

The analytical category of *development* is defined as "the act, process or result of bringing about a new situation".

Development is essentially an economic contributor to resilience, rather than an ecological or social one. It is often consistent with community resilience since development often builds to build community numbers and wealth, thereby driving population growth. Development's contribution to community resilience is constrained when economic opportunities are seasonal, so that people have work for only part of the year. Also when they rely on an initial economic base which is not guaranteed, as in the intentional development of indigenous enterprises.

The potential conflict between environment and development values was noted by several interviewees. Two responses are described in the quote above. The first, approach of ignoring environmental issues and pressing on with development regardless has caused threat to human health in this local area, thus constraining resilience. The second of obtaining accurate scientific information to identify niche areas for development may be more promising in the long run.

Environmental features

"Our abundance of clean water. Our underground aquifer is fairly resilient. It replenishes itself. As far as we are aware it's not susceptible to contamination on a scale that would affect anything. So the region could grow and produce more. And it is growing and producing more. We have a wet season every year." *Northern Territory LG group.*

The analytical category of *environmental features* is defined as " the prominent and conspicuous parts of the environment, including ecosystems and their constituent parts, natural and physical

resources, qualities and characteristics of locations and the social, economic, aesthetic and cultural conditions that affect or are affected by them".

Environmental features were only mentioned as effective in driving resilience, and most of the quotes coded here were from Northern Australia, particularly the Northern Territory. This suggests that environmental features seem to contribute to resilience in places with relatively low levels of development, where environments have not yet been clearly over-used or degraded. This apparent source of resilience will decline as development advances. Tropical weather patterns, with predictable summer rains and large terrestrial aquifers also feature in of most of the places where environmental features were identified as underpinning resilience. Perhaps confidence about water supply contributes strongly to resilience.

Diversity

> "A very wide cross-section of people and land types and agriculture types, and soil types, rural industry. There is a people thing about agricultural industries and the people in them. Agricultural people are resilient. They have to be. If the Lucerne growers are having a bad year, the croppers are having a good year. An example is my own little town without many businesses, which have been in downturn. But the town is absolutely thriving and looking at subdivisions to support the new people. The wool industry has been going down, but people have been looking to other things." *South Australian LG Group*

The analytical category of *diversity* is defined as "the state or fact of having difference and variety".

Diversity was almost always described as an effective contributor to resilience. This often included diversity of environmental features, which gave rise to several independent economic opportunities, combined with variety within the community. Diversity makes it likely that a downturn in one enterprise will occur at the same time as an upturn in another, making it unlikely that the whole community will suffer at once.

The one quote in which diversity was described as ineffective in driving resilience speaks of different sections of the community failing to work effectively together.

Cooperative efforts

> "The integration of agencies, and working to continually enhance that integration. The alignment, ensuring that strategies and plans are aligned, and that agencies are working together." *Eastern Victorian Catchment Management Authority Officer*

> "There really is a gap between the will of the state and the needs of the local community ensure that outcomes are achieved, and until you do that, it is just wasting money." *Western Australian Wheatbelt LG Chief Executive Officer*

The analytical category of *cooperative efforts* is defined as " helpful willingness in working together to achieve NRM outcomes".

All of the responses that described cooperative efforts as contributing positively to resilience were from staff of regional NRM agencies within the Murray Darling Basin, where integrated catchment management has been a long-term program, and the current regional NRM agencies are fairly well aligned with their predecessors.

The second quote above is from the only LG official who mentioned cooperative efforts, and this describes conflict between spheres of government as a constraint to resilience.

It seems likely that awareness of and positive views about cooperative efforts are more prevalent among workers within regional NRM agencies, for whom these efforts are a primary role. These agencies could well take note of an apparent gap between their perspectives and those of the local agencies that they consider are being aided by their efforts towards cooperation. It would be interesting to ask farmers or others not in government or organisational roles about the importance of cooperative efforts.

Commitment

"Well I think that there is an enormous understanding of the importance of Landcare. I can remember when I was a child, and my father was on the water authority. There was terrible water erosion in the shire. There were literally millions of tons of soil being washed away. My father also had to deal with the wind storms of the 1940s. My father and his colleagues used to despair. I remember one day he came home and a farmer had said 'soil erosion has been going on for millions of years and there's nothing we can do about it'. Now to have open gully erosion is like having leprosy. There is still quite a lot of it around, but no-one wants to have it. People realise that they have lost their most basic commodity as far as the environment is concerned when they lose their soil." *Western Victorian LG group*

"There is a lot of good will in the community about needing to change how we manage the land, how we use our water whether it is rural, urban or whatever. But a lot of people are confused about how to do it, because it is so big. A lot of people would accept that there is a need to change, but little knowledge about how we do it. That's where we need all of the different sectors working together like industry, government, the community." *South Australian Regional NRM Agency Officer*

The analytical category of *commitment* is defined as " the political and personal will and intention to achieve NRM outcomes, including the support of council, the community and/or a relevant plan or policy".

Commitment was only mentioned a few times as a foundation of resilient communities, and when it was, there were usually other issues involved as well, such as knowledge, a long time-frame for actions, or cooperative efforts, as in the quotes above. Both of the times that it was mentioned as ineffective in driving resilience were related to insufficient knowledge about what needed to be done, rather than a lack of commitment to action.

Money

> "Productivity in the agricultural sector helps a lot because we have the richest agricultural shire in the country. This gives us the cash to put back into NRM activities. That's a big plus. On the tablelands they would apply for a grant, but here they just write a cheque. The good productivity base to fund the activities is the key. This is a council issue though, because surplus funds aren't there. There are probably pockets within the shire that are cash-strapped. But the cropping and irrigation areas are more amenable. The capital is going to come from the landholders." *Northern New South Wales Regional NRM agency officer.*

The analytical category of *money* is defined as " cash available to invest in achieving NRM outcomes, which may be flexible, tied to specific initiatives, raised through rates or received through grants".

Predictably, money was seen as an effective aid to resilience when it was present within the local area. In the one quote where the impact of money was described as unclear, the uncertainty related to capacity to obtain money through grants. This suggests that a strong financial base derived from the local area helps communities to achieve resilience. However as suggested by the quote above, local wealth may not be consistent with financial capacity at the institutional level.

Chapter 5: Learning about local environmental challenges

Resilience – inside-out report 5

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> "There are probably a variety of ways that I learn about natural resource management issues. One is talking in the street and learning of the average ratepayer's concerns. It's also discussions in chamber, where councillors bring up issues that need to be resolved. I also read the professional magazines that come through. It's also association with peers on a professional level. Then there is learning from those in other councils and getting an understanding from conferences about the up and coming issues. Also benchmarking, and seeing what others are doing." *South Australian LG Environmental Manager.*

Executive summary

Local government (LG) natural resource management (NRM) practitioners learn about NRM challenges using a wide range of sources. The most common way to learn among contributors to this study was through *face-to-face* interactions, usually with local people, but sometimes at conferences and other multi-agency gatherings, and with scientists and other visiting experts. As well as being the most common way to learn, face-to-face interactions are also highly satisfying. These interactions were commonly identified as the single most useful NRM learning experience for NRM practitioners. LG officials were more likely than those from other agencies to prefer face-to-face interactions as ways to learn about NRM issues, but officials from regional agencies also frequently use this method. Facilitators working within LGs used the greatest range of information sources, and more research would be justified to better understand the contributions being made by this group of practitioners to practical NRM outcomes.

The next two most commonly mentioned ways to learn about NRM problems were through *plans, strategies and policies*, and from *reports and technical information*. Although practitioners mentioned plans, strategies and policies more often than reports and technical information as ways that they learn about NRM issues, nearly twice as many cited a report or technical information as the single most useful NRM information source. As a whole, practitioners were less satisfied with these two modes of learning than they were with face-to-face interactions.

The other main ways that practitioners reported learning about NRM problems were through their *own observations*, through *newsletters and regular updates* and the *internet*. The latter two information sources were always described as satisfactory. Only two interviewees mentioned the internet as a regular information source but five mentioned internet resources as the single best source of NRM information that they had ever accessed. Some of these cases were local internet sites that the practitioners had contributed to. The internet seems to have untapped potential as a quality information source, including possible uses as a clearing-house for locally-relevant

information. Respondent's understood the internet as the most readily updated formal information source.

An executive summary of all key findings from *Resilience* and detailed project methods are all available as separate, linked documents, along with the remaining 'inside-out reports'.

Background to the learning report

Communication of NRM issues is an important theme for Resilience. The project produced its own tailored Kits of Outside Information for local and regional practitioners, and also sought insights about useful NRM information from the practitioners that were interviewed. This report focuses on the latter issue – how local and regional practitioners are learning about the NRM issues that local practitioners consider to be the most important, and which NRM information sources are most useful in learning about them. Two survey questions focused on these issues, and these were linked to a third, which helped to introduce this topic. The three relevant survey questions were:

- What do you perceive to be the most important environmental challenges in your local area?
- How do you learn about those challenges?
- What has been the most useful piece of information you have received about this issue in the past?

Another report deals with the most important local environmental problems, that were identified in the first of these questions. This report presents the responses to the latter two questions. It focuses first on how local and regional practitioners are learning about NRM challenges. A table at the end of the report lists all of the pieces of NRM information that were cited as being the most useful piece of information ever used by a practitioner.

How local and regional practitioners are learning about NRM challenges

The main ways that local and regional practitioners reported learning about NRM challenges were through:

- face-to-face interactions;
- reports and technical information;
- plans, strategies and policies;
- their own observations;
- newsletters and regular updates; and
- the internet.

Figure 1 shows the relative importance of each of these ways of learning based on how often each one was mentioned. Face-to-face interactions appears to be the most common way that local and regional practitioners learn about NRM issues, with other ways of learning listed in decreasing importance in the list above.

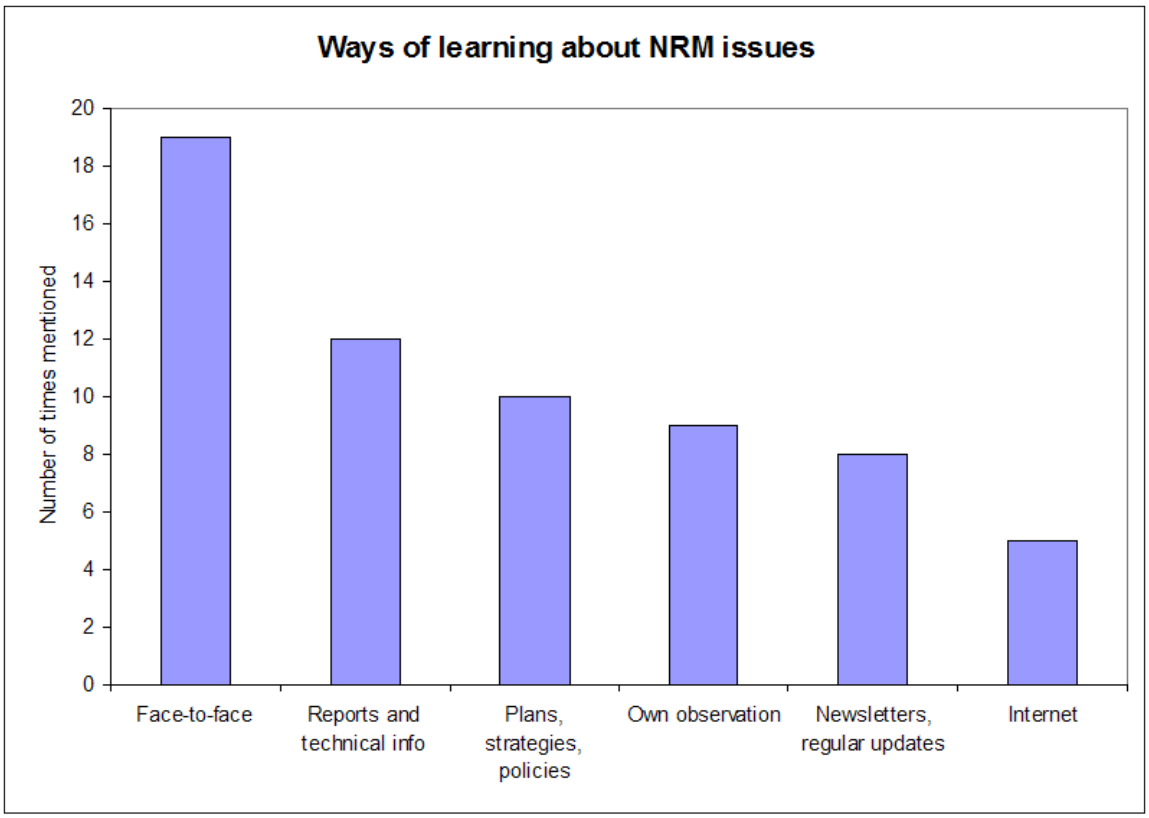

Figure 1 - Ways of learning about NRM issues

Each of these ways of learning is discussed in a separate section below. This section focuses on differences between these ways of learning related to:

- satisfaction in each way of learning;
- different ways of learning depending on a practitioner's perspectives; and
- different ways of learning depending on a practitioner's spheres of government.

Figure 2 shows the levels of satisfaction that were associated with each way of learning. The results suggest that practitioners are fairly satisfied overall with most of their ways of learning about NRM challenges. The three ways of learning mentioned least often were also only ever described as satisfactory. These were through people's *own observations,* through *newsletters and regular updates*, and through the *internet*. The two ways of learning that were most often considered unsatisfactory were *reports and technical information* and *plans, policies and strategies*. The problems associated with these ways of learning are discussed in their respective sections below. *Face-to-face interactions* were usually described as satisfactory.

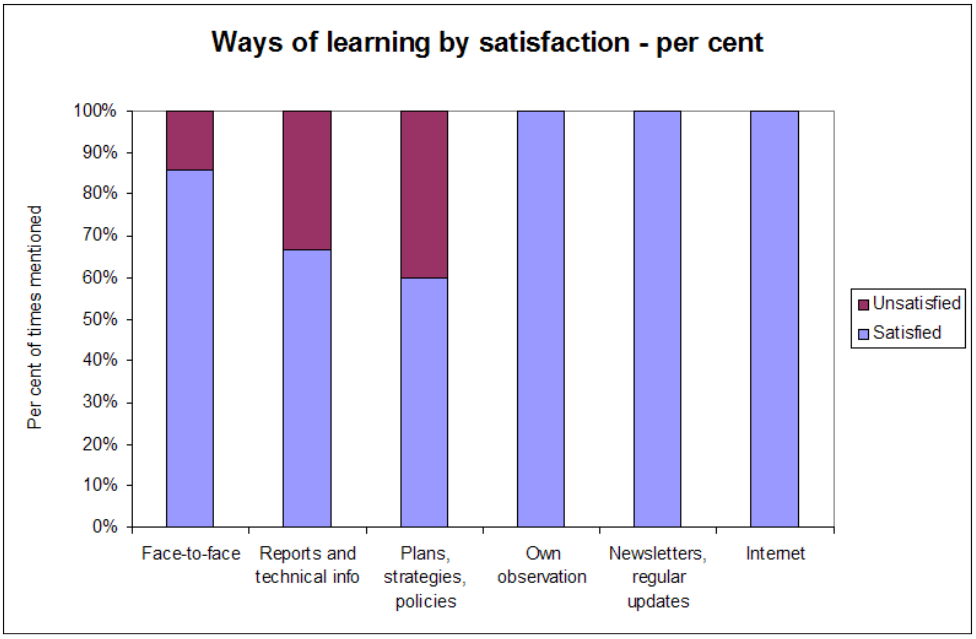

Figure 2 - Ways of learning by satisfaction – per cent

Figure 3 shows ways of learning by perspective. Perspective is a powerful analytical category for explaining different understandings of environmental problems and solutions between spheres (see Wild River 2002 in references and online). There are three subcategories of perspective, as follows.

Inside: Seeing LG environmental issues from a local perspective. Derived from having worked in LG and no other sphere of government.

Outside: Seeing LG environmental issues from a broader perspective. Derived from having worked in regional, state or federal government agencies, but not in LG.

Facilitating: Having a conceptual framework that accepts both other perspectives. Derived from work experience in LG Associations, or with both LG and another sphere of government, including a regional organisation or a regional office of a state agency.

Resilience did not target people with outside perspectives for interviews, and only two of the interviewees had this perspective (see methods report). This was too small a sample size to allow analysis of the ways that outsiders learn about NRM issues and the responses from these two were omitted from this quantitative reporting. Forty interviewees had a facilitating perspective and 36 had an inside perspective, allowing good analysis of the ways that people from each of these perspectives learn. In Figure 3, these perspectives are weighted equally, so the results show how many times each way of learning was mentioned, as if 38 people had been interviewed from each of these perspectives. Three Four are worth noting:

- people from different perspectives made relatively equal use of four ways of learning. These are learning through *face-to-face interactions*, *reports and technical information*, their *own observations* and *newsletters and other regular updates;*
- facilitators reported more use of *plans, strategies and policies* than did insiders;
- insiders reported more use of the *internet* than did facilitators; and

- facilitators overall used more ways of learning about NRM challenges, with over 30 ways described by Facilitators within interviews, and only 20 by LGs.

It is very likely that these results would be different for outsiders. They usually work in capital cities, and so they would be far less likely to use face-to-face interactions with local operators, and direct observations to learn about NRM issues. More work would be justified to investigate the implications of different ways of learning by people with different perspectives.

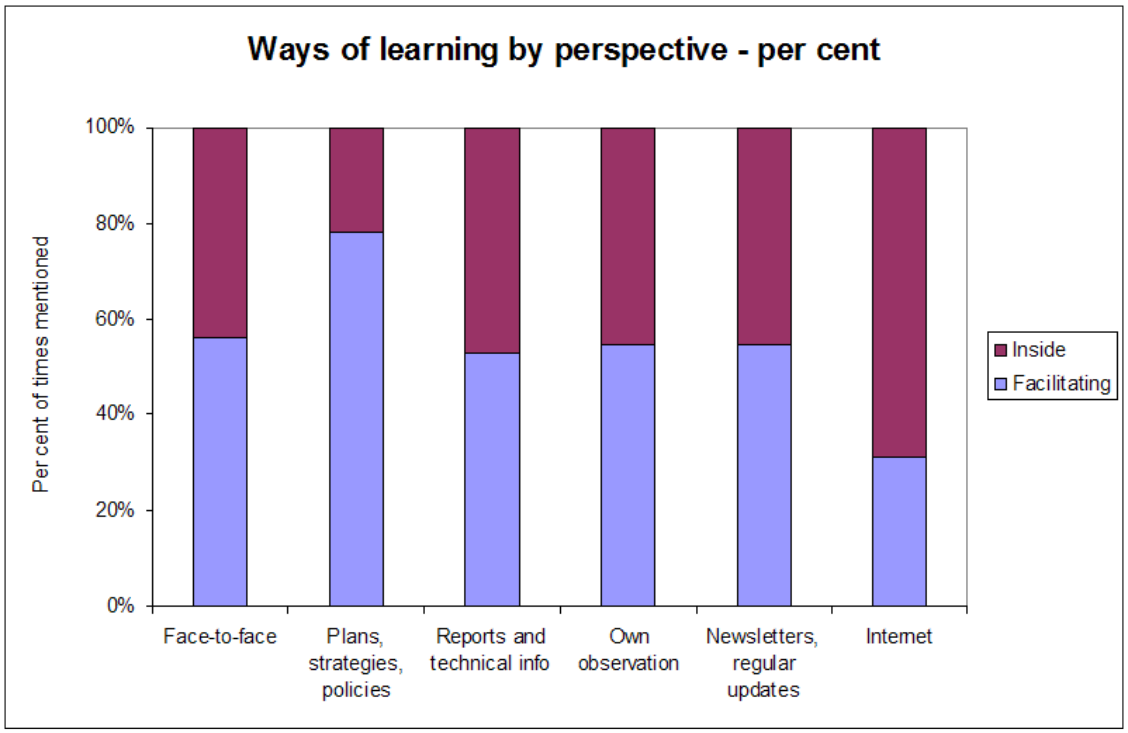

Figure 3 - ways of learning by perspective - per cent

Figure 4 shows different ways of learning by people working in different spheres. Note that although only LG officials may have inside perspectives, those working in LG may be facilitators or insiders. A total of 18 NRM officials with facilitating perspectives were interviewed working within LG agencies. There were 33 interviews of LG officials, and 19 of those from other agencies; once again this graph is produced by weighting the results equally. The results show how many times each way of learning was mentioned, as if there were 26 interviews of LGs and 26 of officials in other agencies. Three points are worth noting:

- LG officials made relatively more use of *newsletters and regular updates*, and less of *plans, strategies and policies* than did officials from regional agencies.
- the use of different ways of learning was not nearly as balanced between agency types as between perspectives. LGs mentioned nearly twice as many ways of learning as did other spheres; and
- these results indicate that facilitators working within LGs learn about NRM challenges using the greatest range of methods.

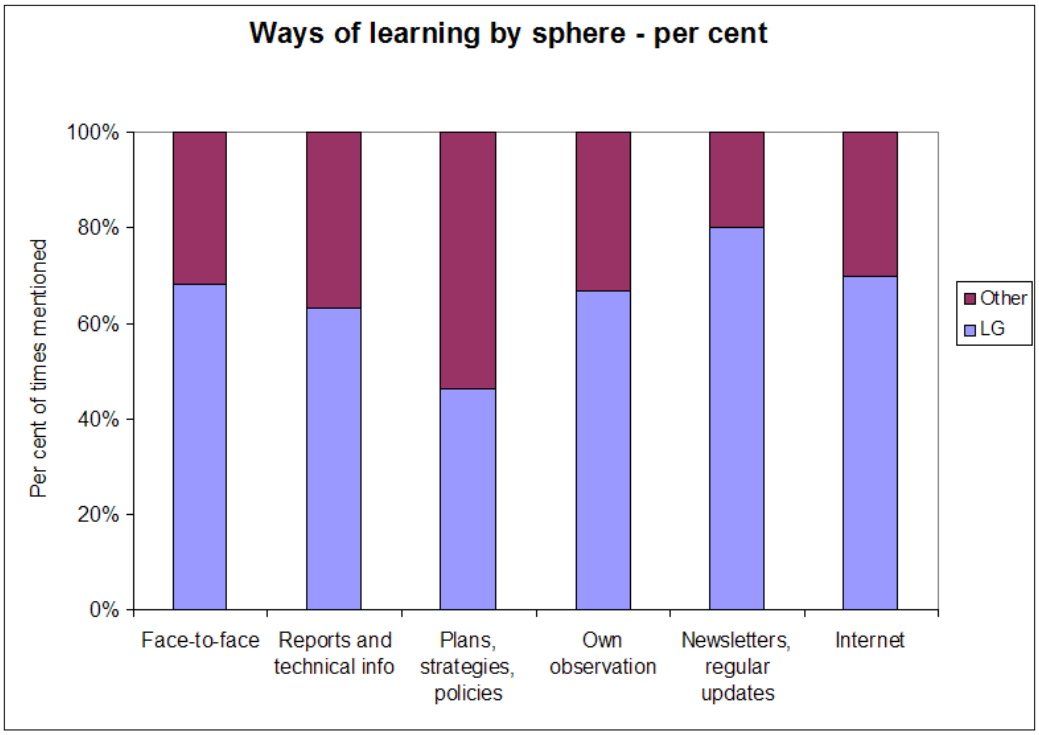

Figure 4 - Ways of learning by sphere – per cent

This last point suggests that facilitators working within LG agencies play distinctive roles in Australia's NRM framework. These findings support hypotheses raised in previous projects by this author (Wild River 2002 in references). They justify further investigation of the roles played by facilitators across Australia, especially those in LG. It seems that identification as a facilitator is a robust measure – facilitators are both self-identifying, and also able to be identified using independent means. These individuals appear to regularly drive more significant beneficial environmental outcomes than do others. Further investigation of the role of facilitators could help NRM program directors to strategically train, place and keep highly effective people in key roles, for greatly enhanced NRM outcomes in the future.

Table 1, below, gives a definition of the cross-cutting issues of ways of learning by sphere. The cells of the table also provide links to the full set of quotes coded into each part of the bars from Figure 4, allowing readers to see what practitioners from each sphere has said in relation to each way of learning.

Table 1 – Ways of learning by sphere - summary

	Local government	Other
Face-to-face	LGs learning from people who are informed by their practical NRM experiences	Others learning from people who are informed by their practical NRM experiences
Data, reports and technical information	LGs learning from reports containing basic scientific findings	Others learning from reports containing basic scientific findings

	Local government	Other
Plans, strategies, policies	LGs learning from and applying initiatives from strategic statements	Others learning from and applying initiatives from strategic statements
Own observation	LGs learning from personal experience with natural resources	Others learning from personal experience with natural resources
Newsletters, regular updates	LGs learning from NRM news sources produced and delivered periodically	Others learning from NRM news sources produced and delivered periodically
Internet	LGs learning from online sources	Others learning from online sources

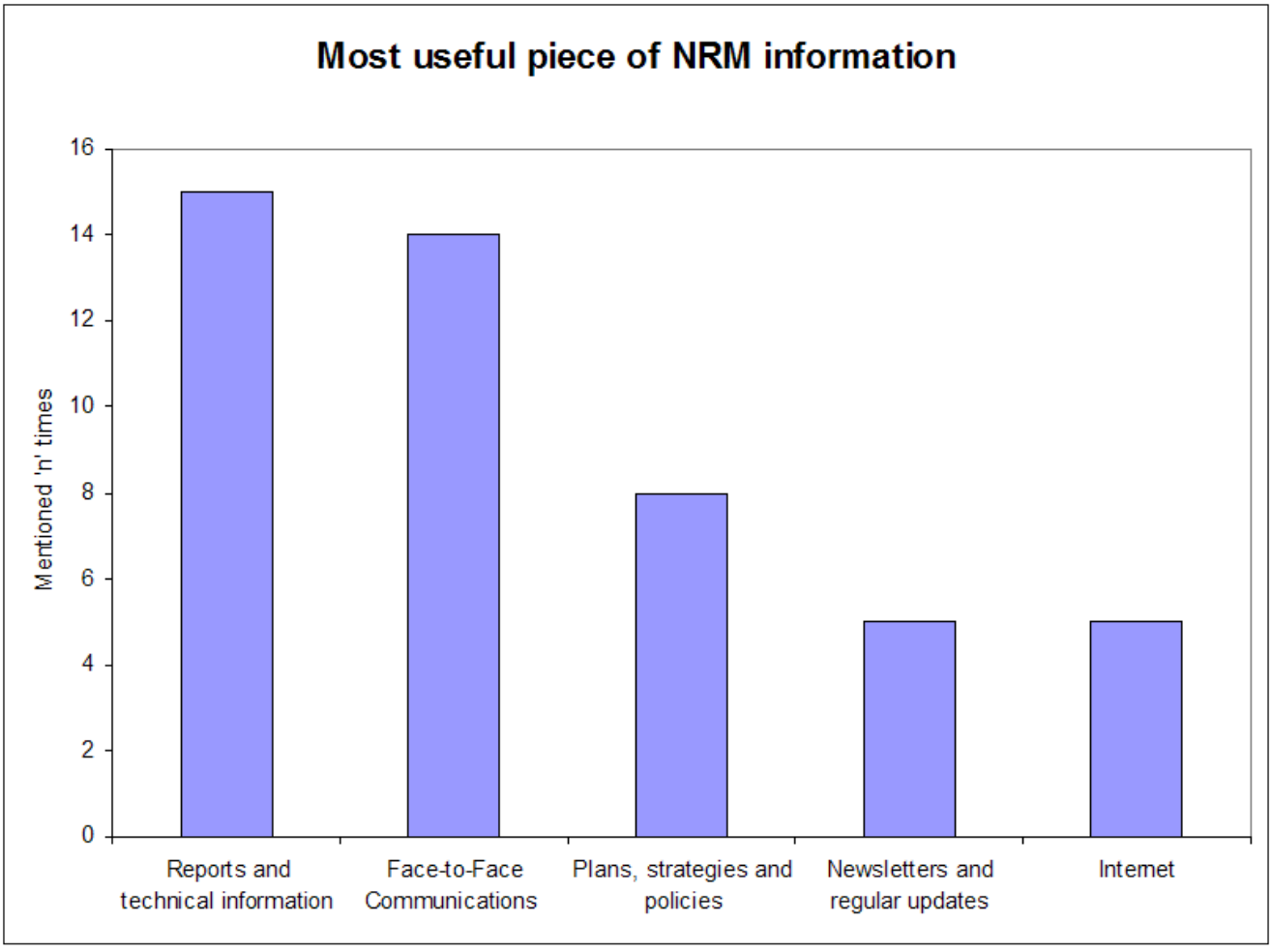

Figure 5 - Most useful piece of NRM information

Before moving on to discuss each way of learning in detail, it is worth briefly considering what practitioners identified as the single most useful NRM information source they had used. A table at the end of this report lists each item that is coded and counted in Figure 5, which shows how that list of information sources compares with the ways of learning identified above. One surprise is that reports and technical information were mentioned far less frequently than face-to-face observations as ways of learning, but most often as a single best source of NRM information.

Face-to-face interactions

> "I have learned from farmers, and from people living on the land. And then I also learn from policies and procedures that are already in place by LG, SG and the AG. But local knowledge is a very powerful thing. These are people that have lived on the land all of their lives, and their families for 3 or 4 generations." *Eastern Victorian LG Landcare Officer.*

The analytical category of face-to-face interactions is defined as "personal meetings between individuals in which NRM matters are discussed".

Practitioners are learning about NRM issues through face-to-face interactions with many different types of people. They include local rate-payers who they meet informally in town, farmers they work with on the land, councillors in meetings, various LG or regional agency officials, scientific experts and other participants at conferences and meetings. The defining features of this most common way of gaining NRM information are the discussions that are held between people, and the relationships that are formed and strengthened as a result of these interactions.

NRM pracitionters are very satisfied overall with face-to-face interactions as a way of learning about NRM issues. They consider that they are getting accurate information through face-to-face interactions. There seems to be a greater tendency to trust insights gained face-to-face than to believe recommendations of scientific reports – most of which are are not based on research conducted locally. In contrast, conversations with people can nearly always be steered towards issues that all participants are interested in, including highly focused discussions about very specific local places, problems or solutions. Face-to-face interactions are also the most up-to-date form of information exchange since people bring their current knowledge to a discussion. A key benefit that flows from face-to-face interactions as a way of learning about NRM issues is that they give officials a direct capacity to influence future actions by farmers and other land holders.

Reports and technical information

> "You get pretty disheartened. People say maybe you didn't choose the right bush. But now I have organised it so that we have some scientific research going into selecting sites. It is looking at tree decline. That project is going now, and has another 6 months and it will come up with a toolkit to help farmers with decision making in regard to remnant bush. I think this is desperately needed. Farmers have been fencing off, and then things go wrong so they don't bother again. Now you don't want that sort of attitude because we have lost enough as it is." *Tasmanian LG environmental officer*

The analytical category of *reports and technical information* is defined as "formal written statements relating details of what has been learned as a result of investigations into NRM matters".

Reports and technical information are methods very commonly used by local and regional practitioners for gaining NRM information, and were also most commonly mentioned as the single best source of NRM information received by individuals. The formats mentioned as the most useful single piece of information were mostly short, highly accessible and applied fact sheets and brochures, or information portrayed in maps, aerial photographs and other spatial representations of NRM problems and changes.

When reports and technical information failed to satisfy, it was generally because the 'gems' of useful knowledge were buried within far greater volumes of information that was irrelevant to local needs. There is also considerable distrust about some of the information contained within technical reports. NRM officials worry about making recommendations based on information contained in reports produced using data from elsewhere, or from too broad a scale, in case the local applications fail to deliver the promised benefits. Many officials who have worked locally for a long time can see degradation the landscape as a result of the previous application of poor technical advice.

There were some interesting insights about combining these two most common ways of gaining NRM information. The following quote from a LG Chief Executive Officer suggests that such a combination might have synergistic benefits.

"The rational decision making is a step above the local community. A big challenge is how to combine those levels of insight and wisdom. You can have the big picture GIS data, but when you meld that with the local wisdom you will really have a platform for making the right decisions." *Tasmanian LG Chief Executive Officer.*

Plans, strategies and policies

> "I'm involved in working groups that feed into the investment for NRM in our region. So I sit in the meetings trying to negotiate priorities for funding, and capacity building for LG. So I try to argue for funds to be invested in areas that regionally aren't perceived to be the highest priority, but sub-regionally and locally they are very important.
>
> As an example, we are trying to get funds for water quality improvements, like saltwater management. This shows the scale of the discrepancy. The '05-'06 funding year we will probably see $300,000 for water quality initiatives federally. That is for nutrients, effluent and monitoring. Yet salinity would be getting about $8-10m on its own. I am sure that is very important, but is this scale of difference appropriate? Myself, and others involved in water quality, don't think so." *South Australian Regional NRM Manager.*

The analytical category of *plans, strategies and policies* is defined as "the formal written statements that articulate NRM initiatives, thus taking the first organised steps in achieving strategic NRM outcomes".

Many of the current plans, strategies and policies are closely associated with resource allocation. Regional NRM agencies are currently producing plans for accreditation which will inform decisions about allocating funds from the Natural Heritage Trust 2. The lack of satisfaction that is commonly reported in relation to plans also tends to focus on their connection with NRM funding. When discussing plans, strategies and policies, practitioners frequently cite instances where funds have been allocated to initiatives of apparently lower importance than other matters for which funding is sought.

Practitioners also report frustration when they contribute to, or agree with a plan, but its implementation is lacking. Plans may also seem flawed when they contradict an official's views about the right way to proceed with NRM.

Successful plans are those that match the views of local and regional NRM officials about local priorities, and that can be relied on to give insights to the types of local priorities to which funds may be allocated. These are the types of plans that are mentioned by many as being the single best source of NRM information that they have received.

Own observation

> "First hand knowledge. The NRM problems are just in your face. We see plastic bags flying around, and see them in the river and in the streets and in the vacant area. We monitor weeds, and keep an eye on them. But we do liaise with Greening Australia and the government on this a bit, but they don't offer to come and spray it or anything." *Northern Territory LG Group.*

> "I can relate to this area that I have lived in all of my life. I saw the trees coming off, and so it went from trees to grass. Lots of grass, lots of stock production, then weeds coming in, various weed species. Then into farming and cropping phases. But the soils didn't have the moisture holding potential. They couldn't keep going with cropping and went back to grazing. And they are now getting depleted. The trend towards irrigation is from people moving in from elsewhere looking for a fresh river and fresh country, but now its tired and diseased. Now they have the water restrictions and the development problems. So in a very small speck of time the fertility has really peaked and then declined because of the fundamental soil type." *Southern Queensland LG Mayor.*

The analytical category of *own observation* is defined as "directly perceiving, regarding attentively and watching NRM phenomena in action".

NRM practitioners find their own observations to be totally trustworthy and reliable, and were always satisfied with this as a way of learning about NRM issues. However, the learning that was achieved was almost never positive, generally informing them that NRM values are deteriorating locally at an disturbing rate. It is also clear that people use their direct observations as data for assessing the value of more formal, published NRM information sources. Their satisfaction with those other sources is higher when they conform to their own observations of phenomena.

Newsletters, regular updates

> "We produce newsletters and other simple information to make sure that everyone has the right information. We are also part of the good email networks." *South Australian LG group.*

> The analytical category of *newsletters and regular updates* is "informal bulletins that are relatively current and widely available but not refereed or otherwise rigorously assessed".

This group of information sources includes newspapers such as *The Land* and other rural bulletins, newsletters – whether mailed or emailed – and updates from specific working groups like Landcare networks. These publications make up a middle ground between completely informal face-to-face interactions, and formal publications. They are more general than the former and more demand-driven and up-to-date than the latter. They were always mentioned as satisfactory information sources, and the quotes suggest that they are eagerly sought and well-read.

Internet

> "The internet now is a pretty good resource. I just about live on it. I don't trust everything that I see on it. It gives me a good range of contacts. You do waste an initial bit of time starting up, but its better than spending $3,000 going to a conference, and not meeting the person you should have met anyway." *South Australian LG Environmental Manager.*

The analytical category of the *internet* is defined as "the publicly accessible worldwide system of interconnected computer networks that transmit data".

Practitioners who reported using the internet as a source of information all reported satisfaction with this way of learning. Probably the biggest surprise for many NRM officials who work outside of local and regional areas will be how few of the Resilience interviewees reported using the internet. This is partly because internet connections are slow – lacking broadband connections – in many rural areas of Australia. It is also because many NRM practitioners focus very much on their field work and not so much on computers in their daily work. The point made at the end of the above quote is interesting, as it suggests that the internet may be able to replace costly travel requirements for remote practitioners in some circumstances.

The most useful pieces of information about important local NRM challenges – summary table

Note the following about the information in this table:

- the number in the header rows refer to the total number of times that an information source was mentioned;
- when a number appears in the first cell of a row, it again refers to the number of times that information source was mentioned; and
- the statements about what makes a report useful are true to the statements made in interviews. Because of this many are in relatively informal language.

Name	Description	What makes it so useful
Reports and technical information (15)		
State of the Environment Reports	State and Australian scales.	These give the broad picture of NRM issues.
National Land and Water Resources Audit (3)	A national perspective on NRM issues.	Maps and information on a wide range of NRM issues, mostly at a national scale.
Fact sheets on Weeds of National Significance.	Produced for all 20 of the weeds of national significance, and available on-line.	Excellent information for identifying and controlling weeds of national significance.
Small brochures on specific issues	For example, a series on vegetation types in waterways.	This information is great to hand out to local farmers. They need to be updated and relevant, and kept informed by new ideas about adaptive management. There also needs to be a contact person so that a practitioner can be referred to an expert.
Roadside weed manual	Produced by Tasmanian Department of Transport in June 1997.	This manual tells you the chemical side of how to manage weeds, times for spraying etc. It is a little bit simplistic, and doesn't talk about biological controls.
Maps of weed and feral animal distributions.	Maps show the location of weeds that are serious within the region.	It is most useful to have the information for weeds within the region that are both currently important and of emerging importance.
Weed Deck	From Weeds Cooperative Research Centre.	Plastic cards on priority weeds – tailored for different regions. These are really practical, and you can take them out into the field to use on a day-to-day basis.

Name	Description	What makes it so useful
Long term database showing impacts of developments	For example, a database that was started before any vessels were docked locally.	Long-term data gives you a bargaining position when dealing with developers. Without this, you can't see the spatial and temporal impacts, and can't do anything about degradation that occurs.
Reports from CSIRO on landscape change	Case study applications of a draft framework for assessing biodiversity benefits of vegetation enhancement activities.	This was produced by scientists, working more broadly, but focused on a specific local area in northern Tasmania for this project. They incorporated some of the data already gathered locally through the NHT1 program. It was great to see some analysis and interpretation of those data.
MapInfo overlays	For example, overlaying weed locations and types on land tenure and use.	This is a current project. It is being constrained by problems in joining different data sets, used by different spheres of government.
Aerial photographs	Aerial photographs of local places.	Being able to compare ground cover, land use and land use changes over time.
Capacity assessment project	Prepared in collaboration with traditional owners, other community members, and scientific researchers.	Its integration of a full range of relevant environmental issues.
Scientific reports on the local areas.	For example, salinity mapping done by the Department of Primary Industries.	Rigorous technical information at relevant spatial scales.
Face to Face Interactions (14)		
A local employee with a degree in environmental management. (5)	Networks that environmental professionals are part of.	Information flowing from people, on their experiences and knowledge of issues. Also what the community members are thinking about the same issues. Informal information flows are what really matters, and the interpretation given to them by practitioners. Assistance with the administrative side of grant applications.
Local community (3)	Informal processes within the community.	For instance, much of the local vegetation removal is illegal, and authorities find out about it through personal communication. This is also the most important information source when initiatives are moving quickly – like

Name	Description	What makes it so useful
		developments with local RAMSAR wetlands and wildlife protection funds.
State government technical experts (2)	Carefully cultivated networks within state government departments.	Technical advisors that you can bounce ideas off and get good advice from have been useful for gaining information about salinity, environmental protection, and specific local features including karst formations in Tasmania. There are some other specialist technical advisors too, but fewer extension staff than in the past. For instance, there are not longer advisors for Bushcare, Rivercare etc and it is not yet clear if regional NRM agencies can access or provide this expertise.
Direct marketing from agricultural product company	For example an American company that supplies black plastic for farming.	Farmers used to burn the waste plastic, and it contaminated the soil. The plastic supplier has done the research and development, as well as operating equipment to safely dispose of the plastic.
Committee meetings	Attended by council staff and Councillors.	Councillors attending these meetings come back with good new information, and make better decisions as a result.
One-on-one contact between experts and the community	This is needed to raise initial awareness about issues.	Once the community becomes aware of the issue, the knowledge about how to tackle it becomes intrinsic. Then you need to develop a whole new suite of information that will work for people on the ground. But you need the right person to do the presentations. They need to facilitate information exchange, not push their own barrows.
Presentations by scientists	For example, one on the demographics of climate change in terms of productivity.	The presentation was very convincing about the scale and significance of the issue.
Plans, strategies and policies (8)		
Regional Catchment Strategy / Catchment Management Plans (3)	Must be right, or it wouldn't be continually referred to.	Local operators ensure that their project proposals are consistent with the strategy to maximise their chances of receiving funds. But catchment management should have been based around local government since the Catchment Management Authorities have established another layer of government that

Name	Description	What makes it so useful
		wastes funds the LGs could be using to achieve outcomes.
State weeds plans.	In Tasmania there are plans for about 87 weeds.	The biggest problem is finding funds to implement this work. Farming is not viable enough to produce extra funds to address the issue properly.
Local weeds strategy (2).	Still being developed - especially by LGs in Victoria.	These will be important documents within a few years.
Local roadside management plan.	Still being developed.	This will cover weeds and grassland management – all in relation to roadsides.
Joint local government initiatives.	For example the Hawkesbury River Trust, with 14 LGs working together.	Joint LGs can be hard to set up, but in this example, the trust led to all sewage treatments plants in the catchment becoming tertiary treated, and resulting major improvements to water quality.
Newsletters and regular updates (5)		
National NHT and Landcare newsletters (2)	Produced by the Australian Government.	They have different perspectives on NRM issues. A lot of stories are from the south, but thats because northern practitioners haven't put in articles. The publications are easy to understand, contain contact information and details on how initiatives worked.
State-regional monthly clock maps	The State Government is producing maps showing each regions progress towards NRM goals as a series of clocks.	This helps regions to tailor their inquiries to regions that are a bit ahead, so that they can gain insights about how they took the next step forwards.
Eco-magazines.	For example, one on soil types.	The one on soil types describes local soils in quite a lot of detail.
Farming newspapers	Stock and Land etc.	Gives up to date information on available technologies and experiences of people using them.
Local Action Plan Newsletter	Produced by council to report on local actions.	This is as good as you can get for local consumption. Everything else tends to be at too broad a perspective, and local people would never actually read it.
Internet (5)		

Name	Description	What makes it so useful
The web – generally (3)	Websites like the salinity tools website, anything on water etc .	Can be updated regularly, accessed easily and increasingly used as a communication mode.
Land and Water Australia website	For instance, information on Riparian Zones.	Learned about this website at a conference on Riparian Zones, and now use it regularly.
Community Access to Local Catchment Information Website	A really good website from the Northern Agricultural Area of Western Australia that won several awards.	The site was set up as a one-stop-shop for information, contacts etc, and a virtual sorting house for available documents, with details on how to find them. This was needed because of the high turnover of staff and community participants. It has faltered due to funding changes.

Chapter 6: Responses to the Outside Information

Resilience – inside-out report

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> "This is very important because if we get anything too bulky we won't use it. We don't have time to research it ourselves. The information has to be compact, accurate and relating to our unique region. We are different from Darwin and Alice Springs that you would probably find more information about. Relevant accurate information is essential. It is a really good thing to have a scientist coming through to decipher it for us." *Northern Territory local government group*

Executive summary

This report summarises responses to a folder called *Resilience Outside Information,* containing selected Natural Resource Management (NRM) information and was provided to 28 local governments (LGs) involved in *Resilience,* and 19 of the regional agencies that they work with on NRM issues. More than 28 different versions of the kit were produced, with each one tailored to NRM issues known from outside to be locally important. The *Outside Information* contained 15 one-page fact sheets, each summarising a key NRM issue, and more detailed scientific and applied publications about the issues of greatest relevance to the local area. The kits were hand delivered to practitioners interviewed for the project who were also asked a series of questions about the importance and effectiveness of its different features. Results suggest that:

- information on NRM issues can be successfully produced at a national scale and tailored to local needs. The *Resilience Outside Information* was very well received and is a good model to build on;
- the set of 15 issues covered by NRM fact sheets matched well with practitioner ideas of what they needed to know. The maps included on them would be a good set to continue improving, and updating at nationaL and finer scales,
- local and regional mapping initiatives are needed to add more detail to the national maps, but it is still valuable for local practitioners to see their own issues in relation to the national scale;
- brief, simple information summarising key NRM issues is valuable to local practitioners. It needs to be accurate and directly linked to the deeper science that underpins it; and

- more effort is needed to articulate the practical, local applications suggested by scientific findings.

Background and context

Resilience is a Land and Water Australia project aiming to enhance local government capacity in Natural Resource Management NRM. Its focus is on improving the understanding that different spheres of government have of one another generally, and of NRM efforts in particular. Resilience is working with 28 local governments – four from each state – and the regional organisations they work with on NRM issues. All participating LGs face serious, multiple NRM challenges. They have mixed levels of prior engagement in regional, state and national NRM initiatives.

The inside-out reports present results from 52 in-depth interviews conducted during 2004 and 2005 with 79 officials from participating LGs and the NRM agencies that they work with on NRM issues. Their primary purpose is to provide insights to state and national agencies about local perspectives NRM issues and initiatives.

Grounded theory and action research methods provide the analytical framework for the inside-out reports. Details on the use of these methods, and the specific techniques that were used are provided in Resilience Methodology Report. A short brochure gives further background to the overall project.

Background to the *Outside Information* report

Resilience was designed as a project with mutual benefits to both research and practitioner communities. One important way that this was achieved was through the provision of *Outside Information* Kits to project participants. The *Outside Information* includes some of the best available scientific work about existing and emerging sustainability problems in each participating area. Outputs from the National Land and Water Resources Audit were a key feature of the *Outside Information* Kits because a core project goal was to work out ways to extent Audit Outcomes to LGs. The *Outside Information* being provided about these issues included:

- Boundary maps relevant to many current sustainability initiatives
- Excerpts from the National Land and Water Resources Audit
- Fact sheets (see below)
- Scientific reports (many available on-line or to order through Land and Water Australia)
- Guidelines for making improvements
- Links to other sources of information

The fact sheets were grouped within six broad NRM issues. These were derived from both local and national perspectives on important NRM issues, and took account of available data sets, mostly from the National Land and Water Resources Audit. They included the following.

- Inland waters – exceeding water quality guidelines for recreation and health; riparian zones and river habitats; surface water availability and; groundwater availability.
- Land – productivity; erosion; dryland salinity and; soil acidity.
- Biodiversity – landscape stress and; threatened species.
- Climate – rainfall and rainfall variability.
- Human settlements – drivers and constraints to changed farming practices and; income and wealth.
- other issues – estuaries and the sea and; Integrated Catchment Management in the Murray-Darling Basin.

Responses to five aspects of the *Outside Information* were explored through Gap Analysis. That is a survey technique exploring the gap between the importance and effectiveness of an initiative. A high level of importance and a big gap indicates a serious problem. The five features of the *Outside Information* whose value was assessed through Gap Analysis are summarised in the graph in Figure 1, and described in detail later in this report.

In addition to the questions on the *Outside Information*, five other questions tackled generic NRM issues. Details and results for the generic NRM issues are available on separate inside-out reports for resources, coordination, consistency and data. A scale of 1-5 was used for rating both importance and effectiveness in all Gap Analysis questions. The scale is shown below.

Table 1 – scale used in gap analysis

Importance	Completely unimportant	Unimportant	Neither	Important	Critically important
Score	1	2	3	4	5
Effectiveness	Totally ineffective	Ineffective	Neither	Effective	Completely effective

Summarising the gap analysis results

The responses to the *Outside Information* were extremely positive. This is most clearly seen when they are compared with those for the generic NRM issues, as in Figures 1 and 2 below. On average, every aspect of the *Outside Information* was considered to be at least both important and effective. There is so little difference between the results for each feature that no further information on the *Outside Information* can be gained from the quantitative results alone. This is compared with generic NRM initiatives – all of which were considered to be important, but none were considered effective.

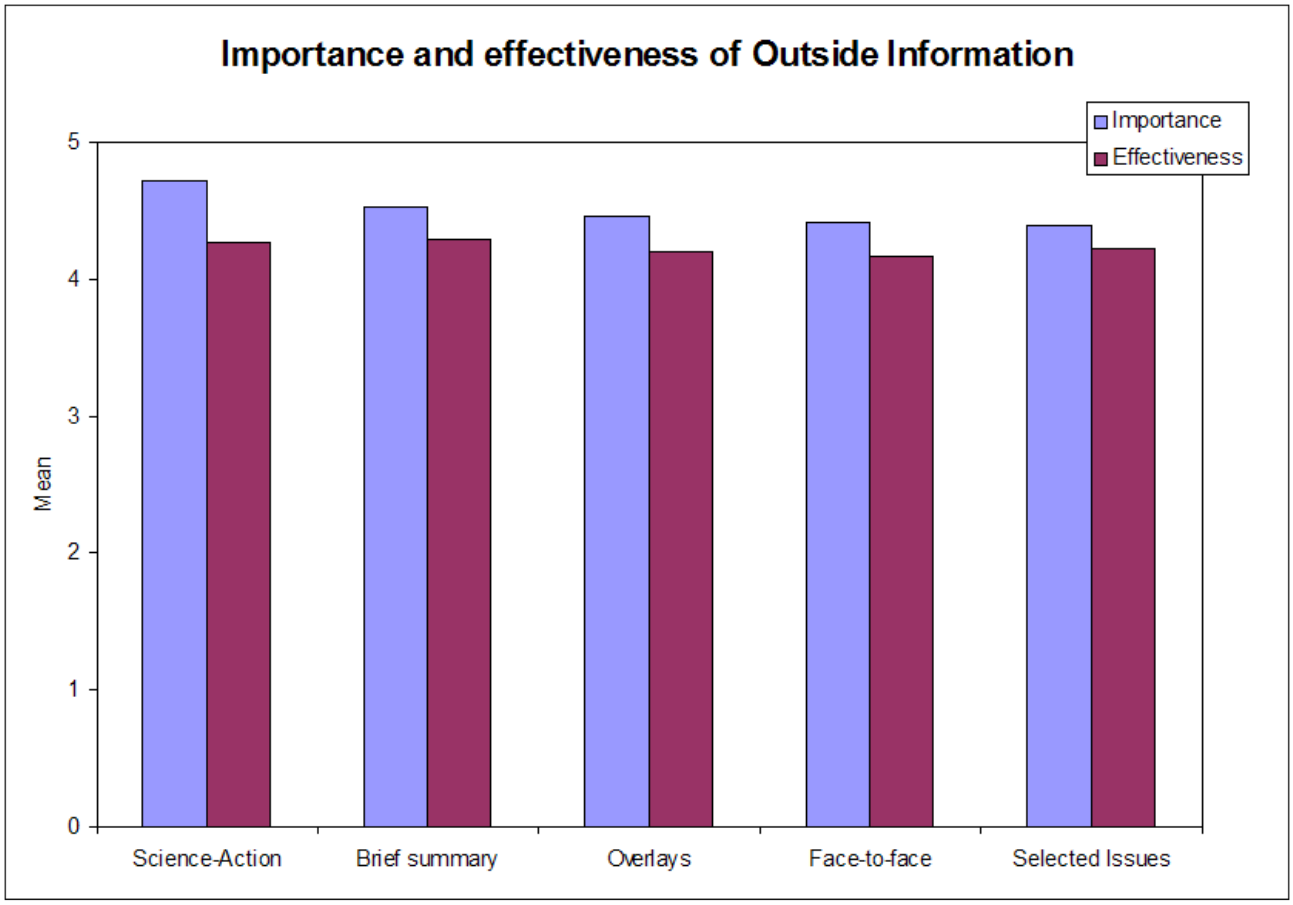

Figure 1 – Importance and effectiveness 1

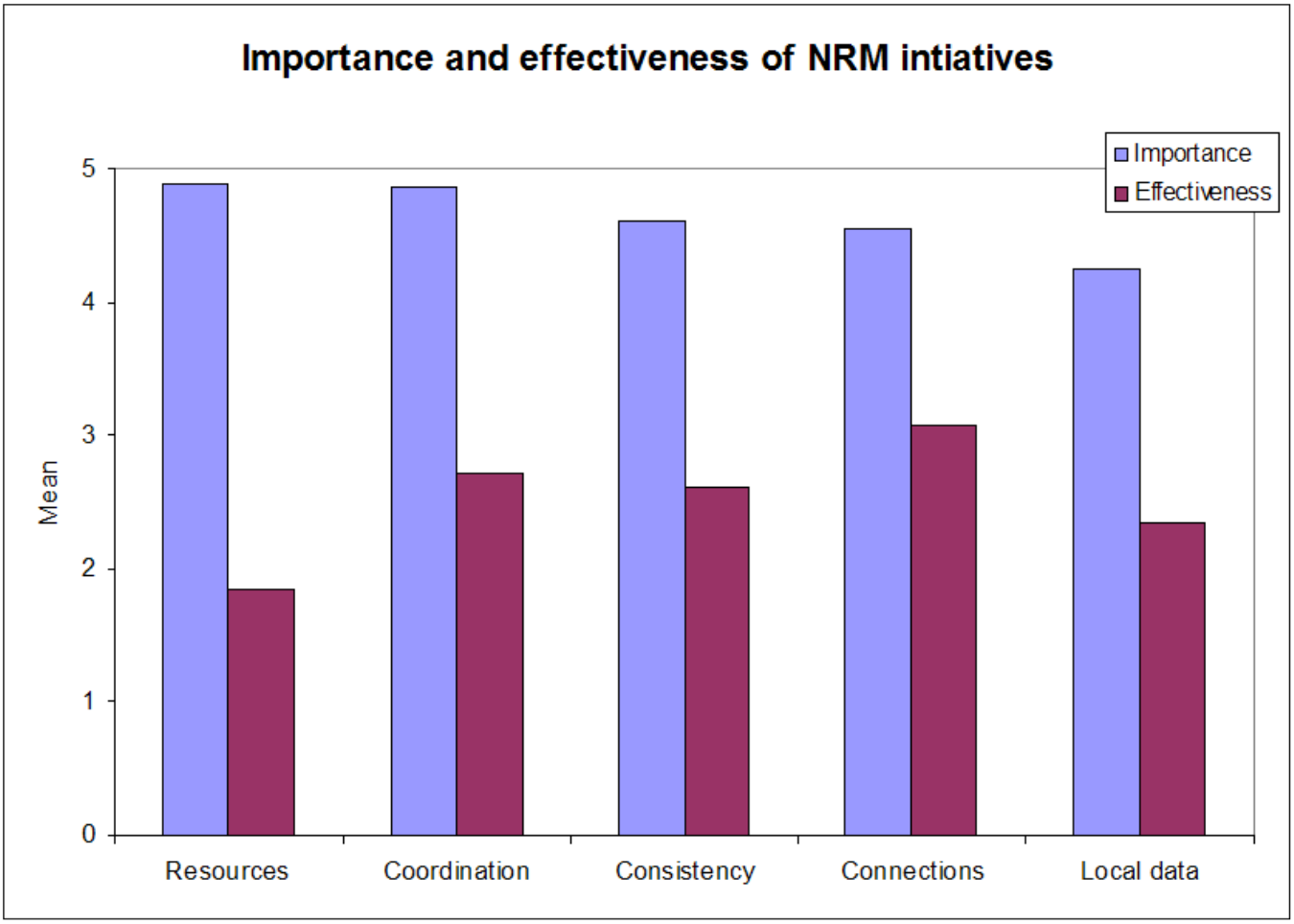

Figure 2 – Importance and effectiveness 1

Figure 3 is a stacked bar chart summarising the results of qualitative analysis on responses to the *Outside Information*. The key features of the *Outside Information* that were explored through the Gap Analysis were each considered in two dimensions. First, there were at least two subcategories induced to explain responses to each key feature. These can be seen in both Figure 3 and Table 2 below, and are defined and discussed later in this report.

The second dimension to the analysis of responses to *Outside Information* related to the success of this information in filling an information gap. There were three subcategories:

- Good in Kit - the *Outside Information* successfully delivered the required information,
- Needed – the *Outside Information* was inadequate to meet the information needs, even though the concept had merit, and
- Already had it – the *Outside Information* was not needed because the agencies either didn't care, or already had this information available to them.

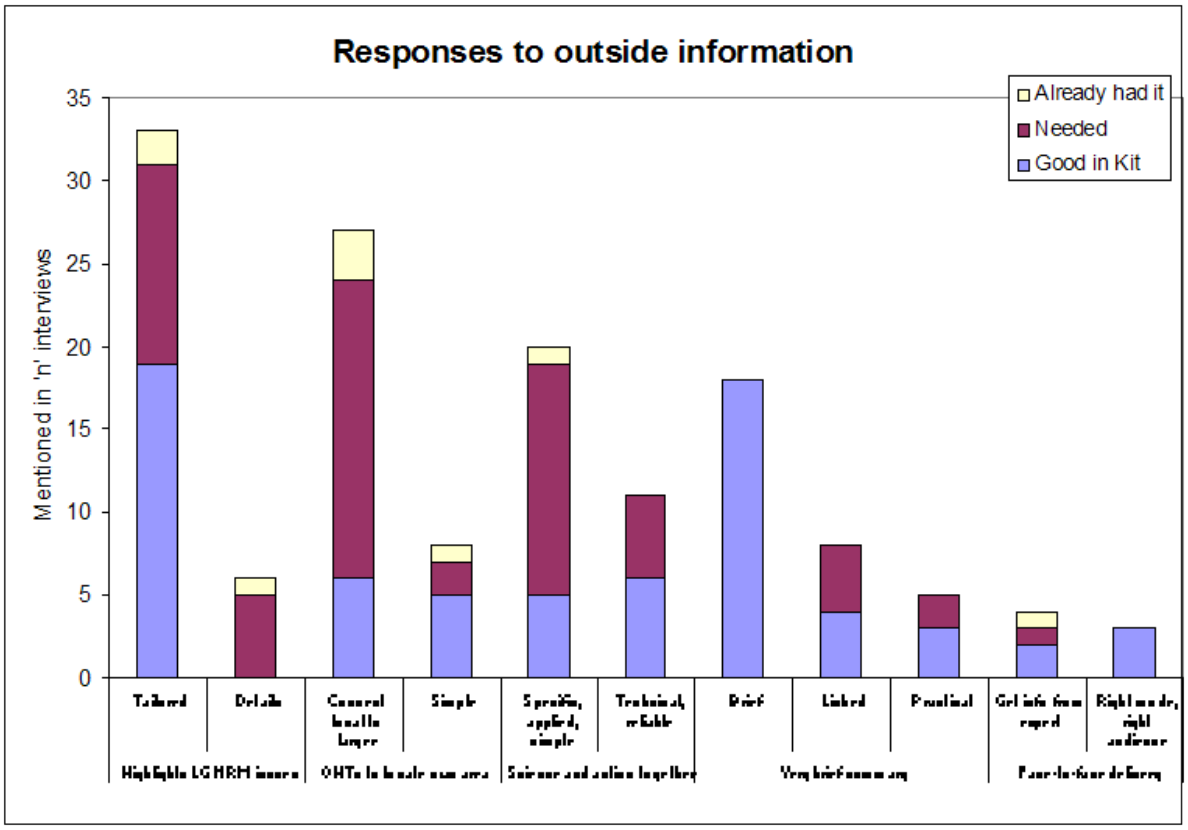

Figure 3 – Responses to *Outside Information*

Broad categories	Sub-categories	Good in Kit	Still needed	Already had it
Highlights LG environmental issues	*Tailored*	Good choice of NRM issues highlighted in kit	Need to liaise with local area to choose issues	Local indicators already identified
	Details	Kit lacks the required detail for local issues	Need detailed information about local area	Local report gives detail
OHTs to locate own area	*Connect local to larger*	Useful to see own area in relation to others	Need bigger, more accurate overlays	Own information has more details
	Simple	Low technology OHTs work well	Need more specific, accurate overlays	Too busy to worry about other LGs
Science and action together	*Specific, applied*	The *Outside Information* structure achieves science-action links	A gap exists between research and on-ground action	LG publications link science to action
	Technical, reliable	Essential to have sound scientific backing to NRM decisions.	The science needs to be sound or it won't be taken up.	Locally-based scientific reports give technical details.

Broad categories	Sub-categories	Good in Kit	Still needed	Already had it
Very brief summary	*Brief*	Short, concise statements capture attention and cover key information	Need brief summaries.	Have brief summaries.
	Linked	Good associations between brief summaries and deeper science	Need better associations between summaries and science.	Local reports give better links between summaries and science
	Practical	Summaries have practical applications	Summaries need better links to action	Local work has practical applications
Face-to-face delivery	*Get info from the expert*	Knowledge, tools and solutions are provided by experts to end users	Information from expert can be time-consuming. Needed sometimes.	Local knowledge exists, but enhanced by input from experts.
	Right mode, right audience	Face-to-face delivery is appropriate for those receiving it.	Some practitioners need face-to-face delivery for certain issues.	Some local knowledge may be enhanced by experts.

The next sections give formal definitions for the analytical categories that were induced from responses to the *Outside Information*. It also includes brief discussions and quotes from practitioners explaining their responses.

Highlights local government environmental issues

The *Outside Information* highlighted LG environmental issues by focusing on NRM issues that were known to be of interest to LGs. It did this by finding the best match between the NRM issues that LGs highlighted as valuable in the publication *Environmental Indicators for National State of Environment Reporting: Local and Community Issues* (Alexandra et al in references), and the outputs from the National Land and Water Resources Audit. Details are reported in Wild River 2005. 15 NRM fact sheets were then developed to highlight the key NRM issues of interest to LGs. These fact sheets were included in the *Outside Information*. They were also used to tailor each individual Kit to the LG receiving it, and to provide links to more detailed, relevant NRM information.

The Gap Analysis questions that were posed to assess the value of this feature were:

- How important is this selection of just a subset of the Audit maps to present to LGs? and
- How effective is this in presenting issues that matter to you?

Tailored

> "the fundamental importance is that rural and remote LGs are under-resourced, and we need to be very careful about how we use resources. If anyone does some legwork for us it is fantastic. Governments bring out a lot of information but its hard to pull out the gems that we need to find." *Northern New South Wales LG group*.
>
> "I would think this is effective because it is the right set of issues we talked about them already, even without the prompting." Coastal *Western Australian Regional Agency CEO*.

The analytical category *tailored* is defined as "designed for the particular receiving agency".

The *Outside Information* Kits were tailored to LGs in that each kit contained detailed information only on the NRM issues that were known from outside to be important locally. This assessment was made by overlaying a LG boundary map onto each NRM map, and identifying which of the participating LGs faced a serious problem in relation to that issue. At least one, and usually many detailed information sources were then included for each NRM issue considered serious for that LG. For instance, LGs shown on Audit maps to have degraded riparian zones received detailed information about riparian zone importance, management, protection and restoration.

The practitioners responding to the *Outside Information* certainly appreciated the effort that had been made to select and present information that had high relevance to their local area. Of all features of the *Outside Information*, the effort of tailoring the Kits received the greatest number of positive comments. More practitioners were satisfied than dissatisfied with this approach to tailoring information to their needs. This was because the 15 issues that were highlighted here did match very well with practitioner's ideas of what they needed to know about. When people needed more tailoring of information, they generally considered that local people needed to be involved in deciding which issues should be included.

Details

> "The biggest problem with something like this is the scale. So with the one on riparian zones and wetlands the scale is too broad. State government mapping systems and LG ones are not compatible." *Northern Queensland LG manager*
>
> The analytical category *details* is defined as "a small section of a larger NRM issue, considered as a separate unit".

None of the practitioners interviewed for Resilience considered that there was enough detail in the selection of NRM issues included in *Outside Information*. Those who stated that they needed more details were interested in both a finer scale of resolution, and also different types of details – for instance more information on weeds, rather than biodiversity as an inclusive category. Note though, that at the time that they were asked this question, they were only being directed to review the fact sheets themselves, and not the remaining information. Some considered that sufficient details were provided once they had reviewed this information – see the discussion on *linked* information below.

Overhead Transparencies

The *Outside Information* Kits used an extremely simple, low-technology method to help practitioners work out which specific NRM problems were significant in their own local areas, and how this compared with elsewhere. Each kit contained an overhead transparency with four maps of Australian LG boundaries, each at a different scale. The scales roughly matched those that were included on the NRM fact sheets. During interviews, practitioners were shown how they could lie these transparencies on the NRM maps to determine which NRM issues affected them. The maps were only roughly the right size because it had been hard to convince graphic designers who produced the fact sheets that an identical scale was an important feature – so the maps on the fact sheets are of varying sizes. Maps within Audit publications are also printed at many different sizes.

This low-technology approach to helping practitioners use the NRM maps is in stark contrast to the high technology approach that had so far been adopted by the National Land and Water Resources Audit in their online Atlas. This approach allows searching, re-scaling and multiple overlays. Some complexities in the system make it difficult to use, and it seemed worthwhile exploring a simple, low-technology alternative.

The Gap Analysis questions that were posed to assess the value of this feature were:

- How important is it to be able to locate your area within this national context? and
- How effective is this approach, using overhead transparencies?

Connect local to larger

> "One of the features of the state is the enormous diversity of land use issues within the area. The map of Tasmania is too small, so we would need it bigger. Its probably possible to do that. It would be a real asset and very widely used. When Tasmania is so small we feel a bit insignificant. There are all of these major issues across Australia, and we look really small." *Tasmanian LG Group*

> "There needs to be a standard map size, and the transparencies need to be perfect. When information has several sources, and has some confidence boundary issues, you want to be sure that you are looking exactly where your shire is on the map." *Southern Queensland Regional NRM Facilitator*

The analytical category *connect local to larger* is defined as "associating small scale NRM issues with their larger context".

The results suggest a very high level of practitioner interest in comparing NRM issues within their local area to those at larger scales. However few felt that the material presented in the *Outside Information* had sufficiently met this need. Most respondents identified a need for more accurate, larger scale maps that could help them to connect smaller local features – even property-scale features – with larger patterns in NRM problems. Of course this is not technically possible since little of the data in current national NRM maps are at a sufficiently fine resolution, or accuracy for local mapping.

This finding supports the current initiatives being pursued by the National Land and Water Resources Audit, as well as many local and regional agencies, to develop NRM issue maps at local and regional scales. The results here suggest that local and regional NRM mapping initiatives will have added value if they connect with maps showing how local and regional scale NRM issues compare with both state, and national pictures of the same issues.

Simple

> "Lovely simple technology - even I could use it." *Northern Territory LG Mayor*
>
> The definition of *simple* is "easy to understand, deal with, use".

Many practitioners appreciated simple technology of the Overhead Transparencies. There was nothing intimidating, little to learn, no help needed from experts, and no high-powered computers or network connections needed to work this system of finding their own local area on the national maps.

As with 'connecting local to larger' pictures, frustrations with simplicity in the overhead transparencies related to the imperfect scales, and lack of fine detail.

Science and action together

Resilience aims to help practitioners link the science from the National Land and Water Resources Audit and other national sources, to actions that could achieve beneficial NRM outcomes locally. To achieve this, for any NRM issue identified as important for a specific local area, the *Outside Information* contained both fundamental scientific research findings (such as Audit outputs, scientific reports), and some materials designed to help practitioners tackle the problems and achieve NRM improvements. These included fact sheets, magazines such as *RipRap,* and practical tools developed through Land and Water Australia projects, and presented on CD Roms.

The Gap Analysis questions that were posed to assess the value of this feature were:

- How important is it that scientific information links directly with actions? and
- How effective is this approach to doing that?

Specific, applied

> "It comes back to that I won't read it if I can't do something about it. The scientific information and the programs are interesting, but its still hard to translate it into something that's really useful for the landholders. I asked some landholders what they thought they could do about biodiversity, and they didn't really know what it was. So I realized it was the wrong approach to take. To most people its not really relevant. I get a lot of information from outside and I wonder why they are sending it to me." *Western Australian Wheatbelt LG Group.*

> "This is really valuable in relation to the regions. In our plans we have to link the priorities with actions. If research agencies could provide any guidance or recommendations in this way it would be extremely valuable." *North Queensland NRM Facilitator.*

The analytical category *specific, applied* is defined as "having a special, practical purpose for improving natural resource management".

This response to the links between science and action in the *Outside Information* emphasised the overriding importance of practical outcomes deriving from scientific knowledge. Few respondents felt that the *Outside Information* Kit gave them sufficient local-relevant detail to inform local actions. According to these practitioners, improving the specific, applied nature of an *Outside Information* Kit would require regular updates, as well as greater connections between science and local contexts.

Technical, reliable

> "One of the reasons that governments are taken so un-seriously in the bush is that in the past, departments have suggested that people plant the plants that are now weeds. Eg land grants in Margaret River depended on people getting rid of all the trees. Bitou Bush was suggested for planting around here." *Northern New South Wales LG Manager (previously worked in South West Western Australia)*

> "We do need to know that information has a reliable source, and that it is also significant. Its no use knowing that there are 5000 weeds in Australia, if only 3 of them cause stock losses. There are only 5 weeds that we tackle as a council." *North Queensland LG group*

The analytical category of *technical, reliable* is defined as "drawing from a rigorous scientific base, that may be relied on as a source of knowledge".

This second response to the links between science and action in the *Outside Information* emphasises the quality of the science, rather than its ready application in a local area. Practitioners have pressing needs for rigorous, reliable science to underpin their decision making and advice on NRM matters. Practitioners also expressed disappointment and concern about advice provided by scientists in the past, some of which has caused current environmental problems. They certainly want to ensure that the science they are relying on will lead to improvements, and not long-term losses.

Very brief summary

The 15 NRM fact sheets included in the *Resilience Outside Information* each contained two short quotes on their respective topics. In most cases, one was a direct quote from a National Land and Water Resources Report, and the other was from an Australian State of the Environment Report. The first quote was selected as the best available, highly valid, short summary of the nature of the NRM problem, and the second summarised its current seriousness. Weblinks to the sources were provided on the fact sheets.

The Gap Analysis questions that were posed to assess the value of this feature were:

- This information gives two paragraphs that summarise why an issue matters, and its status. How important is a very brief summary? and
- How effective are the two paragraphs that are provided?

Brief

> "You have to capture people. If you can put it into something as succinct and focused as this, people will read it." Western Australian Coastal CEO
>
> "The more you write, the less it will get read." *South Australian LG Group*
>
> The analytical category *brief* is defined as "short and concise statements covering the key information on NRM problems"

The very brief summaries on the fact sheets were extremely well received. All respondents who commented on them felt that they were successful. Several people felt that this feature gave the fact sheets great potential value in convincing decision makers to take action on the specific NRM topics. Junior staff felt confident to table them at council meetings. They felt the councillors would read, understand, and trust the information on them because they were brief, attractive, punchy, but also only one step removed from the underlying science, and well respected reports.

Linked

> "You could write a book on each of these, so its about capturing the interest, and showing where to go to find out more." *Western Victorian LG Group*

> "It's a good idea in some ways, but I think if for instance LG don't have a really good understanding of the issue… I suppose they can always go further and look it up. So it shouldn't cloud their view. They shouldn't think that they can make a snap decision on the basis of the summary. And I know that LGs do that sometimes." *Western Australian State Government Regional Manager*

The linked nature of the brief summaries is defined as "the association between brief summaries and the deeper science from which they are derived"

half of the practitioners that talked about the linked nature of the brief summaries were satisfied with this feature, and half felt that more was needed. When linkages were considered successful it was because the weblinks and other information included with the *Outside Information* gave backing to the brief summaries. When more was needed it was generally due to concerns that too much credence might be given to this little information. This suggests that the *Outside Information* could have been enhanced by containing clearer, and better referenced links from the fact sheets to the accompanying detailed information, as well as to other detailed information available elsewhere.

Practical

> "One of the comments I have received from LG is that the CMA doesn't always say why things are important. Councils have a lot of things on, and this may not be their core business, so we always have to stress why something is important." *Western Victorian Regional NRM Facilitator*

The definition of *practical* in these responses was "consisting of, or involving action".

These comments were similar to those made in relation to the need for *simple, applied* science, emphasising the high value of action, compared with theory. In this case however, the focus was on the fact sheets, rather than the other material included along with it. On the positive side, there was a sense that the issues had practical local applications. Some respondents felt that more work was needed to tie them to the practical shifts that need to occur in the local area.

Face to face delivery

Face-to-face delivery of NRM material was only addressed through Gap Analysis after more than half of the Resilience interviews had been undertaken. It was added to the survey because many respondents had noted this as a positive feature of this Action Research process, and it seemed worthwhile exploring the issue further. The impact of only starting this set of questions late in the research process is that few comments have been recorded, and so the number of statements gives little indication of the strength of opinion on the matter. However some useful insights were gained through qualitative analysis, and they are presented here.

The Gap Analysis questions that were posed to assess the value of this feature were:

- How important is it that NRM information is delivered face to face? and
- How effective is this approach to doing that?

Get information from the expert

> "This is much better than if it just landed on our desks. Its good that you are the person who developed it and is implementing it as well. It arrives in the mail. I appreciate the effort of catching up face to face. You feel like you are important to them." *Eastern Victorian LG Group*
>
> The definition of *get information from the expert* is "knowledge, tools or solutions are provided directly from those involved in producing them".

Face-to-face delivery was not thought to be necessary all the time. It is frequently recognised as more time consuming than receiving information through other sources. This is especially the case when practitioners need to travel some distance to attend a briefing session. Several respondents felt well able to receive written information and decide for themselves when and how they would use it.

Right mode, right audience

> "It depends on your audience. For on-ground people its absolutely critical. Its important for the rest of us." *South Australian LG Group*

The definition for *right mode, right audience* is "information is suitable to those receiving it".

Several respondents felt that in some cases, face-to-face information delivery was by far the best option for ensuring that messages were properly received and acted on. Unfortunately there were not sufficient responses to the question of face-to-face delivery to work out whether there were consistent, broadly agreed ideas about which groups needed which type of information.

Chapter 7: Local contributions to regional and national databases

Resilience – inside-out report 7

By Dr Su Wild River,

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> "Did the Audit collect rainfall data for our area? Only through the standard weather stations. We are classified here as having 18 inch annual rainfall, but just around the corner they have 6 inches more. So if you just use the local town data then you have missed a pocket of agricultural economic potential. So even rainfall data needs to be at a smaller scale if you are to pick up all of the real opportunities. That area has just been declared protected by legislation, but it was a real agricultural opportunity." *South Australian local government environmental manager.*

Executive summary

Many agencies are involved in gathering, compiling, presenting and using Natural Resource Management (NRM) data at various scales. This report focuses on the drivers and constraints to incorporating data captured at the local level into regional and national databases. These can be explained in relation to four concepts:

- the **capability** of local people to gather data in rigorous, consistent ways;
- national, state and regional **engagement** with local people;
- the **knowledge** that local people have of their local areas; and
- **access** to databases held by various agencies.

Overall, the results show that local people place a high value on having access to regional and national databases of NRM information. They recognise that high level technical expertise and professionalism are needed to ensure the accuracy of data, and that local people may not have the necessary capability for all data capture. However they considered that local knowledge was essential for informing technical experts about major variations in environmental conditions that occur over small distances. Access to data is improving, but is still a problem in some jurisdictions – notably the Northern Territory.

An executive summary of all key findings from *Resilience* and detailed project methods are all available as separate, linked documents, along with the remaining 'inside-out reports'.

Background to the data report

Data was one of 5 NRM issues explored through gap analysis. Gap analysis is a survey technique exploring the gap between the importance and effectiveness of an initiative. A high level of importance coupled with a big gap indicates a serious problem. The coordination questions were:

- How important is it that local people are involved in gathering environmental information for national or regional reports? and
- How effective are current options for getting local input to national or regional databases?

A scale of 1-5 was used for rating both importance and effectiveness in the gap analysis questions. The scale is shown below.

Table 1 – scale used in gap analysis

Importance	Completely unimportant	Unimportant	Neither	Important	Critically important
Score	1	2	3	4	5
Effectiveness	Totally ineffective	Ineffective	Neither	Effective	Completely effective

Figures 1, 2 and 3 give an overview of the results for local contributions to regional and national databases compared with other issues addressed in the gap analysis. Figure 1 shows the relative importance and effectiveness of each of the five generic NRM issues tackled by gap analysis. Figure 2 shows results for local data alone, for different levels of engagement. Figure 3 summarises responses to local data for agencies within and outside the Murray Darling Basin (MDB).

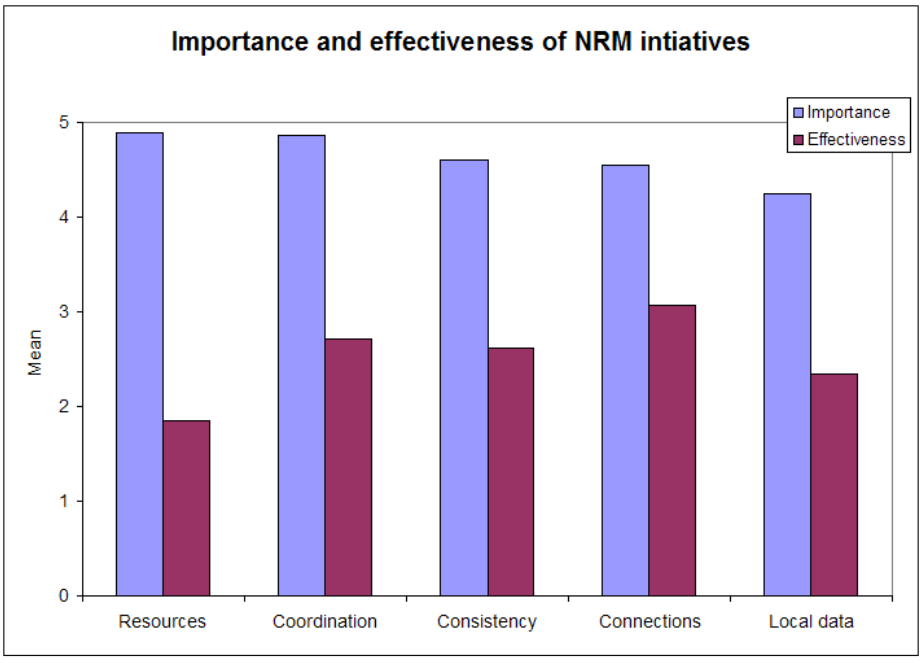

Figure 1 - Importance and effectiveness of NRM initiatives

Figure 1 shows that local contributions to regional and national databases was considered to be a less important an issue than the other four tackled by gap analysis. The effectiveness of data sharing was second lowest of the five, suggesting that there are problems to be resolved.

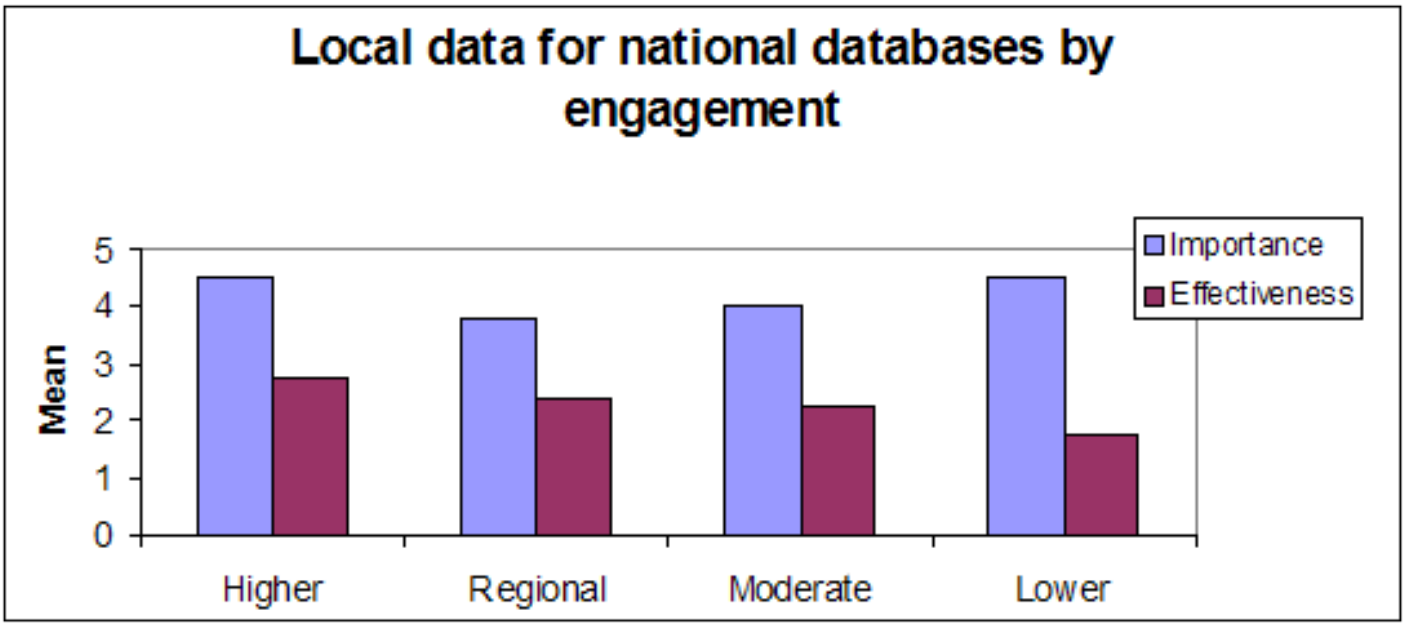

Figure 2 - Local data for national databases by engagement

Figure 2 suggests that there might be differences in opinion about local contributions to regional and national databases depending on an agency's level of engagement in NRM programs. Those with a higher level of engagement thought that local contributions were more effective than did those with lower engagement.

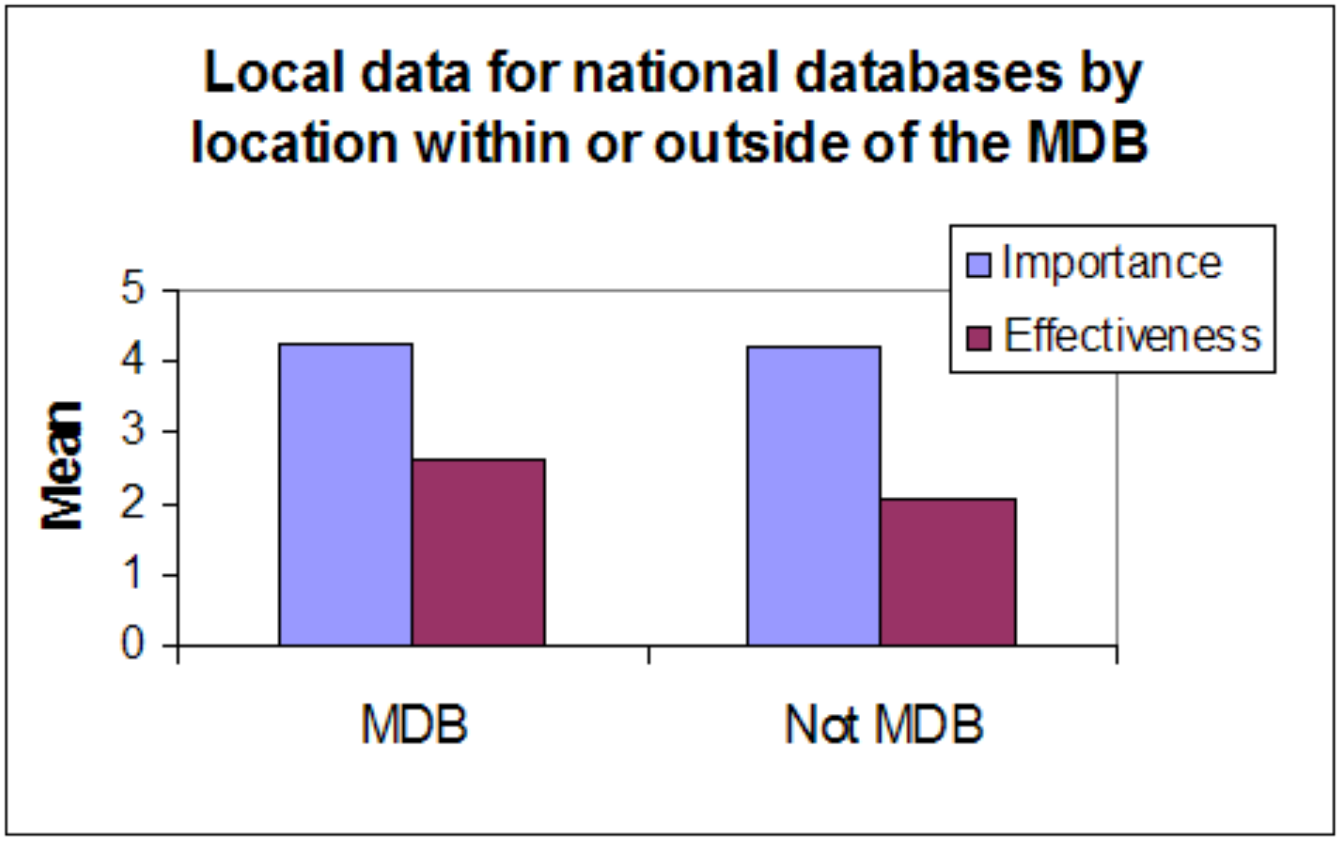

Figure 3 - Local data for national databases by MDB

Figure 3 suggests that there might be differences in opinion about local contributions to regional and national databases depending on whether an agency is within or outside the MDB. Agencies within the Murray Darling Basin perceive fewer problems than those outside the basin.

Figure 4 shows the pattern of drivers and constraints to data sharing within and between spheres of government. These drivers and constraints are discussed in the following sections in relation to local contributions to regional and national databases, and in detail in the report on LG analytical themes. Table 2 also defines these analytical categories.

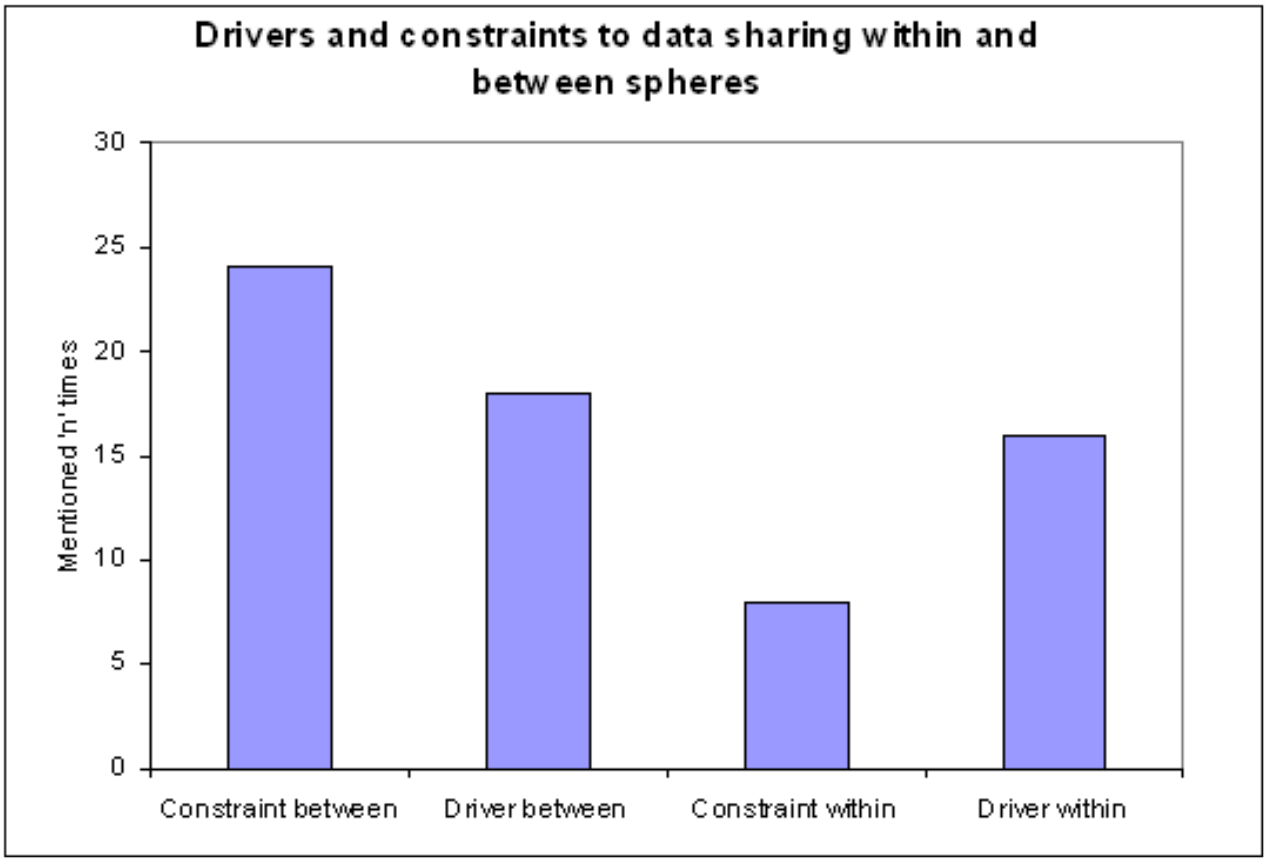

Figure 4 - Drivers and constraints to data sharing within and between spheres

Table 2 – Defining drivers and constraints by sphere interactions

	Between	**Within**
Constraint	**Constraint between** – a force stopping or hindering, and originating or impacting across spheres of government.	**Constraint within** – a force stopping or hindering, whose origin and impact are restricted to one sphere of government.
Driver	**Driver between** – a force causing or helping NRM, and originating or impacting across spheres of government.	**Driver within** – a force causing or helping NRM, whose origin and impact are restricted to one sphere of government.

The results for local contributions to regional and national databases differs from the overall pattern of drivers and constraints by sphere interactions. Most notably, more drivers were reported for these local contributions than for the other issues that were analysed using these analytical categories. In other cases there were more constraints than drivers within spheres, but here there are twice as many drivers within spheres as constraints.

Drivers and constraints of local contributions to regional and national database

Figure 5 summarises the result of qualitative analysis on the range of issues raised in relation to the consistency between NRM plans developed by different agencies. There are two dimensions to this graph. One is the drivers and constraints by sphere interactions, which is shown in the stacks within each bar. The other dimension is the concepts that explain those drivers and constraints. Table 3 defines the drivers and constraints. In the electronic version of this report, each cell of the table links to the original quotes that were coded into that cross-cutting set of ideas. The following sections discuss each of the drives and constraints in turn.

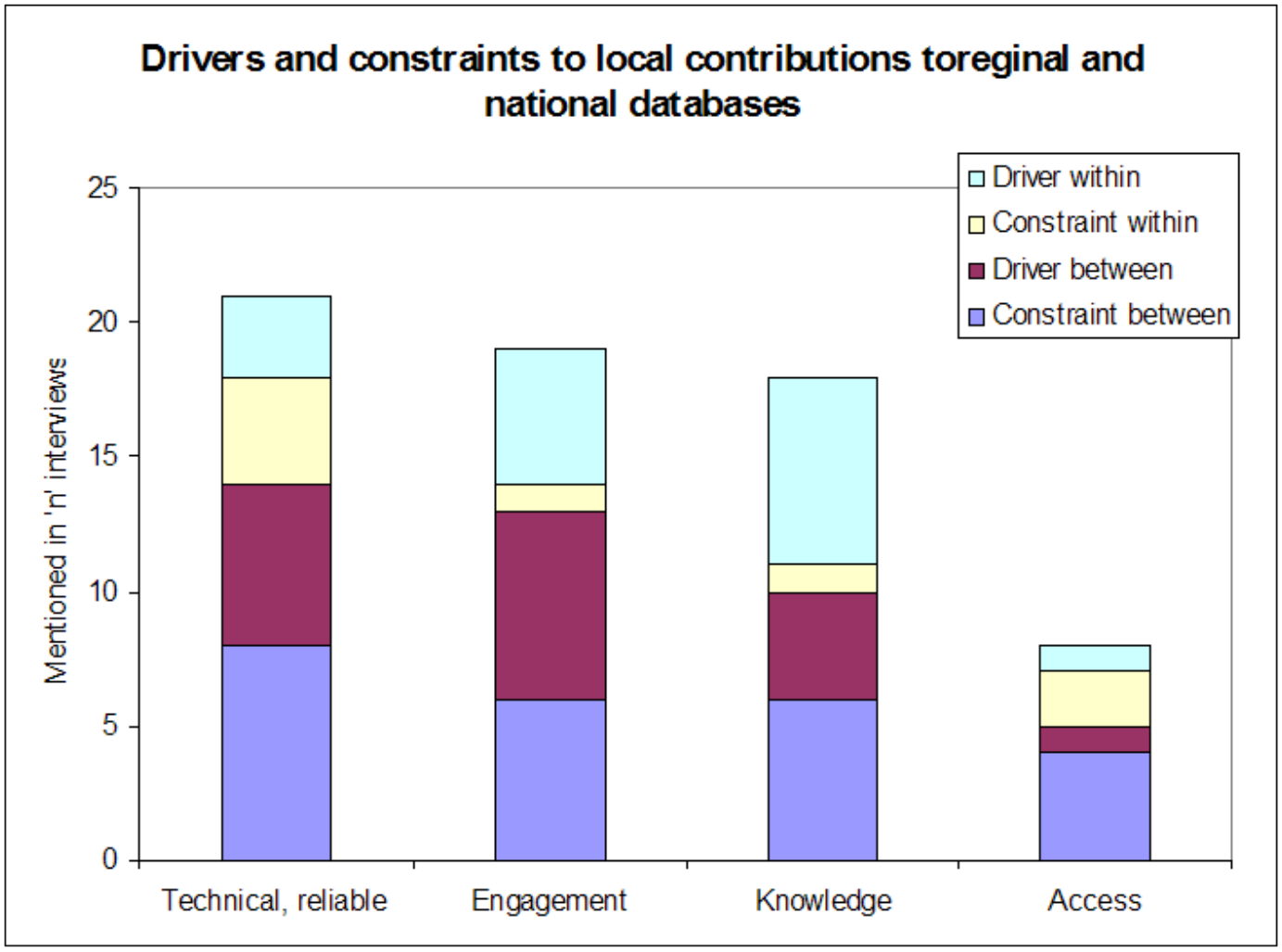

Figure 5 - Drivers and constraints to local contributions to regional and national databases

Table 3 – Definitions of drivers and constraints to local contributions to regional and national databases

	Technical, reliable	Engagement	Knowledge	Access
Constraint between	Locals seen by other spheres as lacking the rigorous scientific base needed for national source of knowledge	Regional and national NRM programs fail to draw on and incorporate local input	Larger spheres lack an understanding of local circumstances needed to gather the right data	Agencies cannot reach the data held by other spheres, and their suggestions about what to monitor are ignored
Driver between	Locals seen by other spheres as having the rigorous scientific base needed for national source of knowledge	Regional and national NRM programs draw on and incorporate local input	Larger spheres communicate with local experts to ensure their data sets are complete and accurate	Agencies can reach the data held by other spheres and their suggestions about what to monitor are taken up
Constraint within	Locals lack the rigorous scientific base needed for national source of knowledge	Local people don't see the broader value of contributions to larger databases.	Local people may not understand the science and add their own bias into data	Individuals within departments don't share data with their colleagues in the same sphere
Driver within	Locals have the rigorous scientific base needed for national source of knowledge	Local people see that their input is valued and valuable	Local people add crucial details to broader data sets	Good processes for reaching and influencing data gathered by different sections of the same agency or sphere

Technical, reliable

"I don't know how important this is but it can happen. We have been working at the moment to allow community-gathered water quality data to be included in the state and federal databases, and they are fighting it all the way, because they don't think the community will gather it in the right way. But I think there could be systems set up so that people could be trained and get the data in the right way whatever that information is. Like they could monitor bores, that's an easy one to do." *Southern Queensland Regional NRM Facillitator.*

"The [National Land and Water Resources] Audit people came around and asked us what we thought the risk of dryland salinity was. He actually knew more about those risks that anyone else in the room. I also know that when the community tried to collect bore data and there wasn't any water in the bore so they didn't see the sense

> in monitoring it every year. You need to measure it regularly. I think this is a role for state government. Regional organisations will invent their own methodology, that then can't be aggregated." *Western Australian Wheatbelt Regional NRM Manager.*

The analytical category of *technical, reliable* is defined as "drawing from a rigorous scientific base, that may be relied on as a source of knowledge".

As a force within spheres this is about people's capability to do the monitoring. As a force between spheres it is about perceptions within both spheres that data provided won't be at the quality level needed.

The analytical category of *technical, reliable* is also used in explaining responses to the Outside Information. That report showed that practitioners devalue national and local data sets when they consider that the science behind them may be flawed, and the most common complaint was that the knowledge being portrayed had not been supplied or applied to the specific local area. Together, these two responses suggest that there is value in having local contributions to those databases, as this would help local practitioners to trust that the scientific knowledge derived from those reports was directly applicable to their local area.

Engagement

> "A lot of people are very interested in those processes and the outcomes, but very little of their input ever seems to come out of the back end of the process. Perhaps their input is crappy, or maybe it is coincidental that the local input isn't incorporated. We get an overwhelming feeling that we are not being listened to by them. I guess that's cynical, but once you have seen a few go through you get really sick of even sitting on the consultative committees." *Western Australian Coastal LG Chief Executive Officer.*

> "Everyone should feel that they are a little cog in a very important machine. We need to feel that we are making a little difference to improve the situation for all of Australia. It's a large part of how you encourage people to participate in what you want to achieve." *Northern New South Wales LG Chief Executive Officer.*

The analytical category of *engagement* is defined as "the degree of involvement in NRM projects and strategic NRM initiatives".

Engagement is a two-way process. People stay engaged when that input is rewarded, but will draw back their engagement if they sense that they are wasting their time.

This is really about being able to see the results of the data that is supplied, in a way that reinforces its capture by the local people so they can see that their input is being valued. Weather stations are another example of this working well, as weather data are collected by people in a mix of official and voluntary positions. Many results are on-line, and also on weather reports, and volunteers and officials alike take their monitoring job very seriously. There is still a tendency within the academic community to take the voluntary information less seriously than the information collected by officials.

Engagement is also the focus of a separate report – *LG engagement in NRM programs*. Three levels are identified – high, moderate and low – and are defined by an agency's degree of involvement in both projects and strategic initiatives such as the development of plans, and participation in NRM Boards and other formal consultative groups.

Knowledge

> "Local contributions are critically important because the locals are here and they have seen the local climate and the changes. They have seen the tourism numbers increase. Everyone knew that the fishing here was going to damage the snapper stock, but they didn't take any notice of it. If a guy has been fishing here for 40 or 50 years, and he can see the changes in his life time that's fact isn't it, not scientific information, its fact." *Western Australian LG Chief Executive Officer.*

> The analytical category *knowledge* is defined as "an understanding of how to proceed towards NRM outcomes, comprising both actions and the context in which they are performed".

Local practitioners interviewed for this project were frequently very aware that accurate data capture can require sophisticated scientific knowledge. They usually considered that even when expert knowledge was needed for accurate data capture, those experts would still benefit from talking with locals about good sites to take measurements. This is because extreme variations exist in local conditions, and without local insights, the experts might miss important conditions that are significantly influencing their findings.

Local practitioners also understood that some data can be reliably gathered by relatively unskilled people, as long as those people understood and were committed to following established protocols that had been agreed for the local area. They suggested that well-resourced LG officials could take on monitoring and reporting roles where advanced technical skills were not needed.

Access

> "This is pretty poor at the moment, but it is improving. DPIWE [Department of Primary Industries, Water and Energy] have a new weeds database, and they are starting to let others use it. But there are still difficulties in the ownership of the data. Local people still can't lodge the information about property boundary changes and things onto those sorts of state government maps." *Tasmanian LG environmental officer*

> The analytical category *access* is defined as "able to be reached and open to influence".

Like engagement, access is a two-way process. The LG frustrations associated with influencing databases are generally based around major variations in environmental conditions that occur over very small geographical areas. These differences are averaged out in the national and state reports, and this hides the variations, which may be highly significant in the local context. Local operators seek ways to improve the accuracy of national databases by increasing their sensitivity to these fine-scale variations that are so significant to locals.

Frustrations about reaching data occur when officials know that an existing database could help to inform local NRM decisions, but the cost and effort involved in reaching the data set makes it

prohibitive. In most Australian states, this type of frustration has been reduced in recent years, partly due to the outcomes achieved by the National Land and Resources Audit. Among the Audit outcomes are consistent protocols for reporting and have provided free access to resulting data sets and maps. The most notable exception was within the Northern Territory. During this research, it was still common there for sections within departments to refuse access even to other sections of the same department. Those involved in gathering data for Northern Territory databases frequently reported that they could not receive the collated information that they had provided in the first place.

Chapter 8: More on the local-state antinomy – what insiders and outsiders understand and misunderstand about one another

Resilience inside-out report 8

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> "The relationship between local and state is at an all time low at the moment. bout 40% of state parliamentarians have been in local government, so it amazes me that they seem to forget about the local government perspective. The deteriorating relationship between the spheres is one of the big problems for local government. there is almost a feeling among local governments that the Federal Government is going to be the one that helps us out. The inquiry into cost-shifting that Wilson Tucky kicked off seemed to be the first glimmer of acknowledgement that the long-term sustainability of LG needs to be looked at. You look in the metropolitan areas where they have a critical mass of resources. They don't feel the financial pressure that the country areas do. The strong are getting stronger and the weak getting weaker. Especially in the big states over west." *Western Australian coastal LG Chief Executive Officer*

Executive summary

The local-state antinomy is a grounded theory proposed by this author from previous research, that explains entrenched poor relationships between local and state governments throughout Australia (See Wild River 2002; Wild River 2005 in references). An antinomy is a form of paradox based on two, internally justified but contradictory statements. The contradiction at the heart of the local-state antinomy is that:

- local governments are creatures and servants of the local; and
- local governments are creatures and servants of the state.

Local government (LG) officials think, act and work consistently with the first statement, while state government officials have the latter view. Neither typically realise that they operate on the basis of unshared points of view on the inherent roles of LG. These entrenched misunderstandings impede cooperation between spheres of government on a range of issues, including environmental matters. The unshared points of view are linked to three possible perspectives on LG – inside, outside or faciliating.

This report identifies and discusses several issues that insiders understand better than outsiders, that outsiders understand better than insiders, and some where understanding is largely shared between perspectives.

Issues that insiders understand better than outsiders include:

- local priorities;
- economic conditions;
- extensiveness-remoteness;
- cultural details;
- few staff, small communities;
- conflicting pressures; and
- volunteer workers.

There is considerable shared understanding about the following issues, although specific details are understood differently depending on perspective:

- environmental features;
- relationships;
- development opportunities; and
- local politics.

The final set of features are understood by outsiders, and either not understood by insiders, or (in the case of the final point) not worth mentioning as insider knowledge. They are:

- bureaucratic systems;
- initiatives; and
- LG effectiveness.

Background to the antinomy report

The local-state antinomy was a theoretical contribution from this author's doctoral studies. As well as being based in action research and grounded theory methods, this work drew on a school of thought known as symbolic interactionism. Symbolic interactionists base their theories on the perspectives, or conceptual frameworks that shape all of their interactions (Charon 1992). These insights lay behind four research questions that were posed to LG and SG practitioners and officers from LG Associations to try and discover the core intergovernmental relationship problems. The four questions were:

- What does LG understand about SG?
- What does LG not understand about SG?
- What does SG understand about LG?
- What does SG not understand about LG?

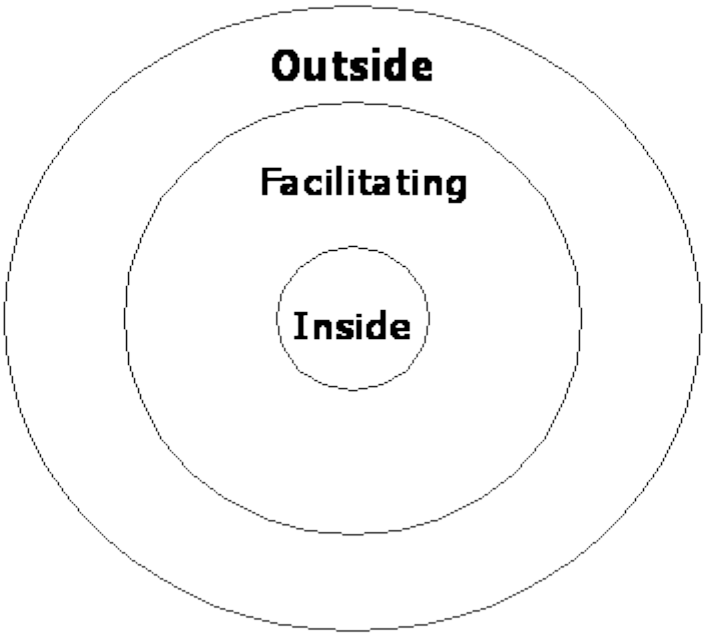
These questions gave respondents an opportunity to describe the issues to which they are sensitised, and those that they consider the other sphere of government to be desensitised to. The answers established common understandings and misunderstandings between spheres. One research output was to identify and define three perspectives on the roles of LG. They are defined below, followed by figure 1 which shows how the three perspectives relate to one another:

Facilitating: Having a conceptual framework that accepts both other perspectives. Derived from work experience in LG Associations, or with both LG and another sphere of government, including a regional organisation or a regional office of a state agency;

Inside: Seeing LG environmental issues from a local perspective. Derived from having worked in LG and no other sphere of government; and

Outside: Seeing LG environmental issues from a broader perspective. Derived from having worked in regional, state or federal government agencies, but not in LG (see LG analytical themes).

Perspectives on local government sustainability work



Resilience used the perspectives that were discovered in this earlier research to inform the overall research design (see methodology report), and also some of the survey questions. Outsiders were not targeted for surveys, but 40 people with facilitating perspectives and 36 with inside perspectives were interviewed. This was a chance to further confirm (or deny) the grounded theory, and to add more depth to our understanding of it.

A discussion of the local-state antinomy emerged during pilot surveys as the best available tool for gaining trust of interviewees. Hence an explanation of this theory was adopted as part of the introduction to the research and interview, and the first survey questions focused on the local-state antinomy. They were:

- Do you think that the local-state antinomy theory is right, or useful?
- What perspective do you have?
- What do outsiders not understand about the inside?
- What do outsiders understand about the inside?
- What do insiders not understand about the outside? and
- What do insiders understand about the outside

All of the answers to the first question were positive, with every interviewee agreeing that the theory was correct, and also useful ("at least broadly"). In all cases but one, people were readily able to identify their own perspective. Before asking what perspective a person held, I made an assessment of their likely perspective based on an introduction that they had given about themselves. The two determinations of perspective were consistent with only one exception[1].

The results of the last four questions were coded into categories with similar features. The results are discussed in the following section.

Quantitative results

Figure 2 shows the results of quantitative analysis of the survey results from the four questions of understandings and misunderstandings. For the sake of simplicity, answers to two of questions have been added together to form each of the bars in this chart. Qualitative analysis had revealed substantial commonalities in the answers to the following questions:

- What do outsiders not understand about the inside? And what do insiders understand about the outside; and
- What do outsiders understand about the inside? And what do insiders not understand about the outside?

Table 1 – below the graph – gives a definition of the cross-cutting issues by summarising the common features of each quote counted with that section of the chart. The cells of the table also give links to the full set of quotes, so that readers can see what practitioners have said in relation to each of these issues. The quotes that are presented in the linked documents distinguish between answers to each of the original questions, so that the full original data is preserved.

The structure of the chart in Figure 2 differs from that of Table 1. Figure 2 ranks issues in descending order based on how many times they were mentioned as being things that outsiders don't understand, but insiders do. This emphasises the issues that frustrate LGs and other local and regional practitioners. The table groups issues into three logical sets for the later discussion. These are based on:

- things that insiders understand but outsiders don't;
- things that outsiders understand but insiders don't; and
- shared understandings.

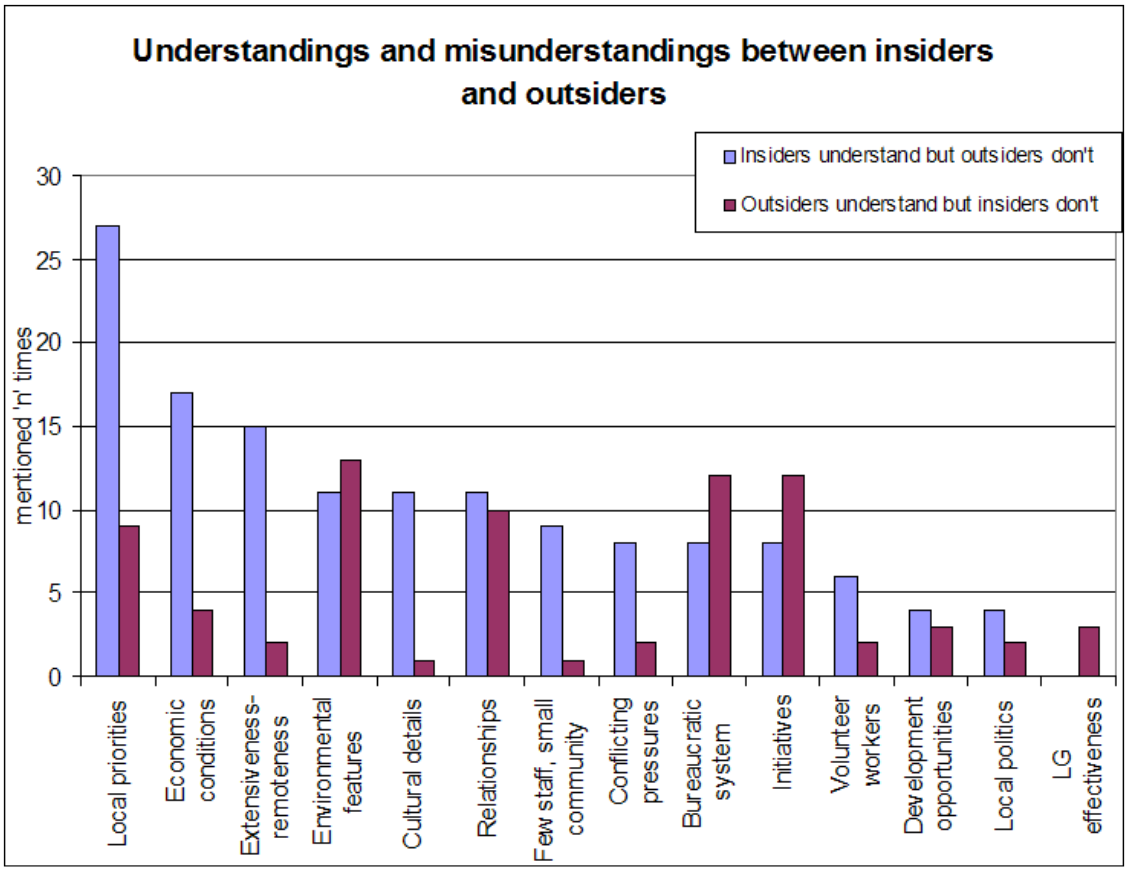


Figure 2 - Shared understandings and misunderstandings

	Insider's understandings, outsider's misunderstandings	**Outsider's understandings, insider's misunderstandings**
Insiders understand but outsiders don't		
Local priorities	Local features that are of greater value than others	Large-scale features that are of greater value than others
Economic conditions	Local financial systems for producing and distributing goods	Regional, state or national financial systems for producing and distributing goods
Extensiveness-remoteness	Degree to which a local area is geographically large and isolated	Difficulty of accessing isolated and geographically large places
Cultural details	The set of norms, mores and values that define a small community	The set of norms, mores and values that define Australia, its states and territories
Few staff, small communities	Small local population settings translating to constrained LG workforces	The need to add staff to small LG workforces
Conflicting pressures	The struggle or clash impacting on local areas due to the simultaneous exertion of two or more competing forces	The struggle faced by local areas due to many priorities
Volunteer workers	Local people who contribute their services without charge	Programs that are delivered at low cost to the taxpayer

	Insider's understandings, outsider's misunderstandings	Outsider's understandings, insider's misunderstandings
Shared understandings		
Environmental features	Ecosystems and other natural resources specific to the local area	Ecosystems and other natural resources in a regional, state or national context
Relationships	Associations that people have with one another within a local community	Associations that people have with one another across many communities, agencies or jurisdictions
Development opportunities	Favourable circumstances allowing actions, processes or results that improve local economic conditions	Favourable circumstances allowing actions, processes or results that improve economic conditions on a large scale
Local politics	The principles, science, art or scheming of government that are specific to a local area	The principles, science, art or scheming of state, territory or the Australian government
Outsiders understand but insiders don't		
Bureaucratic systems	Official government organisations and processes based on principles and rules	Official government organisations and processes based on principles and rules
Initiatives	Programs, policies, or processes that take the first organised step in achieving an NRM outcome within a local area	Large scale programs, policies, or processes that take the first organised step in achieving an NRM outcome
LG effectiveness	The capacity of the local authority to exert a targeted force for NRM outcomes	The capacity of the local authority to exert a powerful force for NRM outcomes

Insiders understand but outsiders don't

The set of features that are discussed in this section are those that were mentioned very often as as things that insiders understand about the outside, and that outsiders don't understand about the inside. But they were rarely mentioned as things that outsiders understand about the inside and insiders don't understand about the outside. It is likely that if outsiders were asked what they understood about the inside, few of them would mention the issues that are identified here. So if people who work in state and Australian government agencies seek to increase their understanding of LGs, this is the set of issues that it is most important to learn about.

Local priorities

> "Communities out in our areas that have suffered population decline are wanting to use water resources for vineyards, olives and that type of thing. And we still need flexibility in thinking to do it right, where it has been proven wrong in other states. We live in a semi-arid environment,

> but we still need not say no automatically. We need to figure out how we can balance it out, and let farmers diversify so that they can put food on the table or pay their bank debt." *South Australian LG environmental manager.*

The analytical category of *local priorities* is defined as "features that are of greater value than others within a specific area".

Insiders have clear understandings of the cultural, economic and natural resource conditions that define the opportunities and constraints facing them. They work to try to better their circumstances – especially when they have been suffering over the long-term due to problems such as an extended drought or environmental degradation. Local people who have managed to stay on the land during the hard years that rural Australia has recently faced have done so through commitment and determination that they consider demand some respect.

Many insiders also claim a reasonable understanding of their own ignorance about local priorities that are connected to broader issues. These people understand that staying will only be possible if they actively learn about NRM challenges, and adapt their land management practices to improve their NRM capacity. However they relate stories of trying and failing to learn and apply new knowledge, when information is poorly delivered to them. Conversely, they fail to adjust to new NRM frameworks that are presented to them when they consider that those frameworks have failed to take sufficient account of the local priorities that will influence their implementation and success.

The insiders and facilitators who were interviewed for *Resilience* sometimes considered that outsiders have a reasonable understanding of local priorities. This was especially when insiders actively brought matters to their attention, or when there major problems – such as contamination or land degradation – within the local area, gained widespread attention.

Economic conditions

> "They don't realize that we don't have the capacity to prevent the environmental problems using our own resources. That should be a huge value. We can make changes that will save the environment. Like in NSW they are spending millions to claw back over allocated water. We can't get any money to avoid causing the problem in the first place. So in 20 years time we will be buying back water leases too." *Northern Territory Regional NRM facilitator within LG.*

The analytical category of *economic conditions* is defined as "the local financial systems for producing and distributing goods".

Economic conditions in Australia's rural LGs are fundamentally dominated by scarcity. This is not just the contention of rural NRM practitioners, but was also a finding of a recent national Inquiry (Australian House of Representatives Sanding Committee on Economics, Finance and Public Administration 2003 in references). LG resource issues are also the subject of another *Resilience* report. Rural LGs still tend to be poor even when the local agricultural conditions are favourable, as there are few links from agricultural profits to LG funding bases. On the other hand, small population sizes and remoteness will increase LG poverty because of the high costs of providing extensive road networks and basic services to remote communities.

Insiders and facilitators interviewed for Resilience consistently claim that outsiders don't understand the fundamental resource scarcity that they face both within the LG and within many rural and

remote local areas. This resource scarcity becomes more serious as additional roles are handed to LG, and as NRM conditions deteriorate and warrant extra attention. LGs have not way to raise the funds that are required to address these problems from within the local area.

Insiders and facilitators argue that more funding should be made available from outside to address local NRM problems. They make cogent arguments to justify this point of view, stating that it is especially important to receive outside assistance when:

- there are large-scale or long-term benefits from better NRM;
- there are public as well as private gains;
- predictable problems can be prevented rather than fixed at greater cost later on; and
- roles are being passed from other spheres to LGs.

Extensiveness-remoteness

> "Communication problems, traveling distances. For example in any funding application you have to have original signatures and letters of support. In some instances they won't accept faxed copies. Wet season lasts 4 months, and you can't physically get to an area. You may have to travel great distances to get to one area. The time it takes to fill out application forms is longer because of these reasons." *Northern Territory regional NRM agency manager.*

The analytical category of *extensiveness-remoteness* is defined as "degree to which a location is geographically large and isolated".

Being situated in extensive and remote areas impacts on all aspects of the operation of many rural LGs. Some of the common impacts are:

- greater travel time to meet with peers or experts;
- greater costs associated with travel and communication;
- higher cost of service provision;
- lower population density and overall population;
- greater difficulty in attracting and retaining good staff; and
- failure of outsiders to understand the physical realities of the local area – or even where it is.

Cultural details

> "As for understanding the attitudes and the aspirations of graziers on the western side of the range – they just don't understand it. I have just done a capacity building project from the wet tropics, and it was very qualitative. The differences are like cheese and chalk. State agencies fall over backwards in amazement when they see what the real issues are." *Northern Queensland Chair of regional NRM agency.*

The analytical category of *cultural details* is defined as "the set of norms, mores and values that define a community".

An understanding of indigenous issues, and the challenges in dealing with them are among the most commonly cited set of cultural details that are not understood from outside. The respondents here reported some common outside perceptions of indigenous issues – such as crime and the provision of welfare and legal aid – as missing the point. The issues that concern them more are dealing with indigenous travelers who visit the area and camp illegally, sit in raucous but otherwise innocuous family groups in public areas, have untreated health problems fail to attend meetings because they are attending funerals, or understand their own true ownership of local land and are troubled by poor legal recognition of that.

When non-indigenous cultural details were mentioned the details themselves were not made as clear. People talk of attitudes, aspirations or other unique features as being poorly understood from outside.

Few staff, small communities

> "Well, we are lucky that we do have a building surveyor but many LGs don't have these. We share our EHO, and planner with other councils. But our manager of environmental services is a qualified building surveyor, so we are lucky... We have 30 people on the whole staff. Take 12 out who are doing environmental health, building and the rest. That only leaves 18 to look after 770kms of roads, plus all of the sewage schemes and the rest. A lot of cost shifting does go on between SG and LG. An example that is coming up now is non-forest vegetation. The NHT [Natural Heritage Trust] bilateral agreement states that LG will manage all of the non-forest vegetation through our planning schemes. This means that we are going to have a whole officer doing this work. Especially during the harvest times when the vegetation is all being disturbed. The financial implications are enormous. It will cost $100,000, and that is a 13% rate rise." *Tasmanian LG Chief Executive Officer.*

The analytical category of *few staff, small communities* is defined as "a low population setting translating to a constrained LG workforce".

Outsiders don't understand the basic lack of human resources available to fill the ever-increasing general and NRM roles of LGs. This is an important constraint to LG engagement in new NRM programs, as LGs whose human resources are over-stretched will avoid taking part in new initiatives that only have short-term funding available. The well-based fear is that state and federal agencies will withdraw funds as soon as the local community gets used to the new services and demands that they continue. In those cases LGs are left carrying the new services using their own limited human resource capacity.

Conflicting pressures

> "There are pressures from many different directions and government departments. The different agencies all want management plans, with the same deadlines. " *Northern Queensland LG group.*

The analytical category of *conflicting pressures* is defined as "a struggle or clash caused by the simultaneous exertion of two or more competing forces ".

LGs face conflicting pressures due to:

- statutory requirements to produce an ever-increasing number of plans, policies and reports;
- a need to deliver services and provide infrastructure according to externally established compliance criteria;
- initiatives that demand matching funding for NRM projects when there is not abaility to increase rates or otherwise raise money from local sources;
- programs that need marketing to the public plus implementation or regulation by LG; and
- new and complex legislation, some of which does not make sense in the local context.

Volunteer workers

> "My whole family are farmers, and they try hard to do the right thing. They have a vested interest in doing the right thing, and they have a sympathy and love for the land, that a lot of people who join the activist groups don't share. They don't have a sense of being dependent on the land and the water in the same way that farmers do. I my experience, some of the best land carers are farmers." *Tasmanian LG group*

The analytical category of *volunteer workers* is defined as "people who contribute their services without charge".

Many current and successful NRM programs work in part through the efforts of volunteer workers. Landcare is the best-known example, where rural landholders work together to fix soil erosion, weed, riparian zone degradation and other problems. Outsiders know about these programs and the important roles played in them by volunteers. But they don't understand the practical realities associated with program implementation that are gradually eroding community willingness to put in the required voluntary work effort. Some examples from the interviews include:

- over-consultation where volunteers are expected to attend countless meetings and comment on draft policies and legislation – knowing that the presenters are paid to be there;
- the strain of overly bureaucratic systems for obtaining funding; and
- the increasing need for accreditation, certificates and insurance to perform tasks that have been done successfully by voluntary locals for decades.

Shared understandings

This set of issues were mentioned nearly evenly as things that outsiders both understood and didn't understand, and also that insiders both understood and didn't understand. Hence this set include many features that are broadly understood, together with subtleties that are not so well known.

Environmental features

> "I think people have an underlying understanding that they have to try and manage their properties sustainably. So that involves for instance allocating water for environmental flows. People won't disagree with the concept. They might agree with the amount. It's the same with bushland. They don't disagree that there is a need for some native bushland, but they might disagree with the state or Australian government about what is valuable." *Tasmanian LG environmental officer.*

The analytical category of *environmental features* is defined as " the prominent and conspicuous parts of the environment, including ecosystems and their constituent parts, natural and physical resources, qualities and characteristics of locations and the social, economic, aesthetic and cultural conditions that affect or are affected by them".

Some environmental features that were identified as known to outsiders were the:

- nature of some environmental problems, especially dryland salinity;
- location of some biodiversity hotspots;
- dominant agricultural industries within particular regions;
- high appeal of some places in contrast with low appeal of others;
- emerging technologies and techniques for improving productivity while reducing resource intensity; and
- scarcity of water across most Australian landscape.

Some of the subtleties that are misunderstood about local environmental features are:

- the lack of productivity in the rangelands, and that activities such as weed or erosion control will either never be cost-effective, or will have pay-back periods of decades. However the public good benefit may still justify the required investment;
- that unfavourable weather conditions can make on-ground work impossible. This can hinder the effectiveness of work conducted under funding programs with requirements that are too specific;
- that state-wide environmental specifications might be meaningless in some places – like specifying that building heights stay below the treeline, when some places have no trees;
- that rivers need to have open mouths if they are to flush out contaminants and remain ecologically intact;
- the level of tree decline and baffling problem of dieback in some areas; and
- that life in the country is tough, not romantic.

Relationships

> "I don't understand how they perceive us or our roles. There is a big communications gap. We don't have anybody from government departments that are dealing with similar issues coming and seeing us and saying 'we have this big bag of money and will help you to clean up the river'. Its more of a big stick approach. " *Northern Territory LG group.*

The analytical category of *relationships* is defined as "associations that people have with one another".

Most of the relationships that were discussed in interviews were between government agencies rather than individuals. There were many comments about poor relationships between state governments and the regional and LG agencies. Many reported a greater level of understanding between Australian government agencies and local and regional agencies than between the latter and state agencies. Relationships with the Australian government however were reported as being fraught in relation to timelines and complexity involved in funding arrangements.

Development opportunities

> "I see people's attitudes changing when they really achieve something. People are looking for self-satisfaction in terms of performance. In terms of getting out there and doing something for the community. People love the reward from that. I see our role as involving providing them the opportunity for that leadership." *Western Australian wheatbelt LG Chief Executive Officer*

The analytical category of *development opportunities* is defined as "favourable circumstances allowing actions, processes or results that bring about a new situation".

Outsiders were thought to understand some of the benefits of development. The Regional Development Commissions were understood as outside contributions within the local area that could help to achieve local development potential. However some areas are still largely unaware of the potential value of these Commissions for assisting local development.

Outsiders were also sometimes criticised for a lack of responsiveness to the development needs of local areas. Insiders and facilitators often felt that flexibility and assistance was needed to get allow development initiatives to start up. This might include for instance granting farmers access to groundwater reserves, under the condition that farms would use water wisely.

Local politics

> "Outsiders don't understand local politics. Decisions that are made are usually based around local politics, rather than strictly speaking the right way of doing things."

The analytical category of *local politics* is defined as "the principles, science, art or scheming of government that are specific to a local area".

Local politics are just as complex, and sometimes not too different from the politics operating at broader levels. In all spheres, politicians try to make popular decisions and avoid unpopular actions so that they will be re-elected.

A difference is that in LG, there is a greater chance that an unpopular decision will also impede basic day-to-day life. That is because LG politicians – especially those in rural areas – tend to know or be known to most of their electorate, and to be neighbours, customers, clients, tradespeople or merchandisers to a high proportion of their constituents. Clearly, an unpopular decision could result in a backlash leading to severe personal difficulties. LG politicians and other officials often adopt a negotiating role, rather than harshly prosecuting minor misdemeanors as a result of these close ties to communities.

Outsiders understand but insiders don't

This set of features include those that are better known to outsiders than insiders, or are more worthy of mentioning in relation to outsiders.

Bureaucratic systems

> "The biggest issues now are process. Particularly now with the coastal reforms. The processes that are in place for approval and planning processes, native title all of those types of things. People are overwhelmed by them. There are so many of them, and some of them are so complex. In our little area, a friend of mine was looking to buy a

> caravan park. He asked 'what are some of the significant planning issues up there', and I said, well there is the nomination for World Heritage, the existing Protected area, the new strategy, the new restricted areas. You have native title to understand, the State Coastal Setback Policy. And by the time we went through all of these things he was so overwhelmed by what he needed to understand on a remote piece of coastline that this bloke was really put off. And he is a professional who does buy and sell businesses as a matter of course." Western Australian coastal Chief Executive Officer

The analytical category of *bureaucratic systems* is defined as "official government organisations and processes based on principles and rules".

The outsiders are generally considered by insiders to the the instigators of bureaucratic systems. They are also widely thought to understand them better. This includes the reasons that they need to be so bureaucratic, and the way that they are supposed to work. Howeverr several of the comments recorded here also contend that the outsiders themselves may be baffled by the complexity of the systems they have created.

There were many comments of bureaucratic systems being beyond the comprehension of local people. They are variously described as nonsense, overdone, duplicitous, slow, complex, red tape, and a hassle. No comments were recorded about things that insiders so understand about bureaucratic systems.

Initiatives

> "I think they have adapted from NHT1, and the blue paper that came out in 1999 the first discussion paper about regional process. They have realized that the delivery mechanism needs to be closer to the local level, so that the local or regional level has more control over what priorities are funded, and its delivery. That is one of the key things. They recognize the value of facilitators and coordinators in assisting the community and driving programs more efficiently. And they have learned the value of being engaged in regional processes themselves. Reducing the number of programs and making it less complex although now they are bringing in more programs themselves. They have given LG more of a formal role in the regional process. They are funding the LG NRM Facilitators around the country, and making it a main role in NHT2 for LG to be one of the key stakeholders. And recognizing indigenous interests. And they have recognized that industry in general wasn't engaged in NHT1 very well, so they want to bring that back in. The have recognized there were some gaps in NHT1. There are probably other things too." *South Australian regional NRM facilitator*

The analytical category of *initiatives* is defined as "programs, policies, or processes that take the first organised step in achieving an NRM outcome within a local area".

Comments about initiatives were in stark contrast to those that talked of bureaucratic systems. Where frustration was the universal factor in those statements, appreciation dominates here. There is recognition that:

- some issues demand a broad framework to underpin them;
- outsiders bring large-scale issues into their initiatives, anchoring them in good knowledge and science;
- many of the broad-scale initiatives are genuine attempts to make improvements amid complexity;
- many of the problems tackled by these initiatives are important for Australia;
- even if the rules appear to change, there are often good reasons behind the shifts;
- NRM and economic conditions have improved as a result of initiatives driven from outside; and
- outcomes need to be demonstrated after money is allocated.

The frustrations that were recorded about initiatives focused again on the bureaucratic systems adopted by them, and their failure to provide consistent, predictable or long-term funding bases for implementing the strategic land use changes that they demand for their success.

Local government effectiveness

> "I think they understand that we are now a fairly reasonable LG to work with. That we are getting results." *Tasmanian LG Chief Executive Officer.*

The analytical category of *local government effectiveness* is defined as "the capacity of the local authority to exert a powerful force for NRM outcomes".

Several people commented that outsiders understand the effectiveness of LG, but no-one made the comment that insiders to understand this. However this result should not be taken as an indication that LGs do not know about their own effectiveness. It is more likely that this issue didn't rate a mention among the many other things that insider's understand, while being outstanding in the smaller group of issues that they recognise as being relevant to NRM, and understood by broader spheres.

1The interviewee whose perspective was unclear had only worked in LG for one week, and had previously worked with state government. This would normally make him a facilitator, but he identified as an outsider. It is most likely that he would change his estimation to 'facilitator' after few months within the LG, so this was not considered a sufficient reason to alter the definitions, or any other aspects of the theory.

Chapter 9: The resources needed to fulfill local NRM roles

Resilience – inside-out report 9

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> "We have the infrastructure, the machinery, the men. We are the coal face organization with lots of capacity to do on-ground projects. We just need a little bit of guidance in the direction, and the funds to do the work. Our basic infrastructure is there going to waste. It only needs a bit of tweaking and we are ideally set up to do work in those areas." *North Queensland LG Environmental Manager.*

Executive summary

Rural local governments (LGs) face serious constraints due to a shortage of essential resources for many of their roles, including Natural Resource Management (NRM). The agencies that they work with on NRM issues are not so acutely aware of these problems as are LGs themselves, particularly those that have been less engaged in NRM programs. Important resources for NRM include money, knowledge, commitment, statutory authority and time. Any of these resources may be used to do practical work, fulfill essential NRM roles, attract skilled and committed people, build infrastructure or make plans for strategically solving NRM problems.

The biggest resource problem facing LG NRM practitioners is a lack of money to do practical, on-ground work. LGs also lack both the money and statutory authority that they need to fulfill their essential local NRM roles. There are some areas in which LGs are relatively well-resourced. Many have enough money to develop NRM plans, and a sufficiently strong commitment to tackle essential NRM roles. There is also enough local knowledge to undertake much of the important local NRM work.

An executive summary of all key findings from *Resilience* and detailed project methods are all available as separate, linked documents, along with the remaining 'inside-out reports'.

Background to the Resources report

Resources are one of five NRM issues explored in *Resilience* through gap analysis. Gap analysis is a survey technique exploring the gap between the importance and effectiveness of an initiative. A high level of importance coupled with a big gap indicates a serious problem. The questions on resources were were:

- How important is it that local governments have the necessary resources for their NRM roles?
- How effective is the provision of these resources to local governments?

A scale of 1-5 was used for rating both importance and effectiveness in the gap analysis questions. The scale is shown below.

Table 1 – Scale used in gap analysis

Importance	Completely unimportant	Unimportant	Neither	Important	Critically important
Score	1	2	3	4	5
Effectiveness	Totally ineffective	Ineffective	Neither	Effective	Completely effective

Resources compared with other gap analysis results

Figures 1, 2 and 3 give an overview of the results for resources compared with other issues addressed in the gap analysis. Figure 1 shows the relative importance and effectiveness of each of the five generic NRM issues tackled by gap analysis. Figure 2 shows results for resources alone, for different levels of engagement. Figure 3 summarises responses to resources for agencies within and outside the Murray Darling Basin.

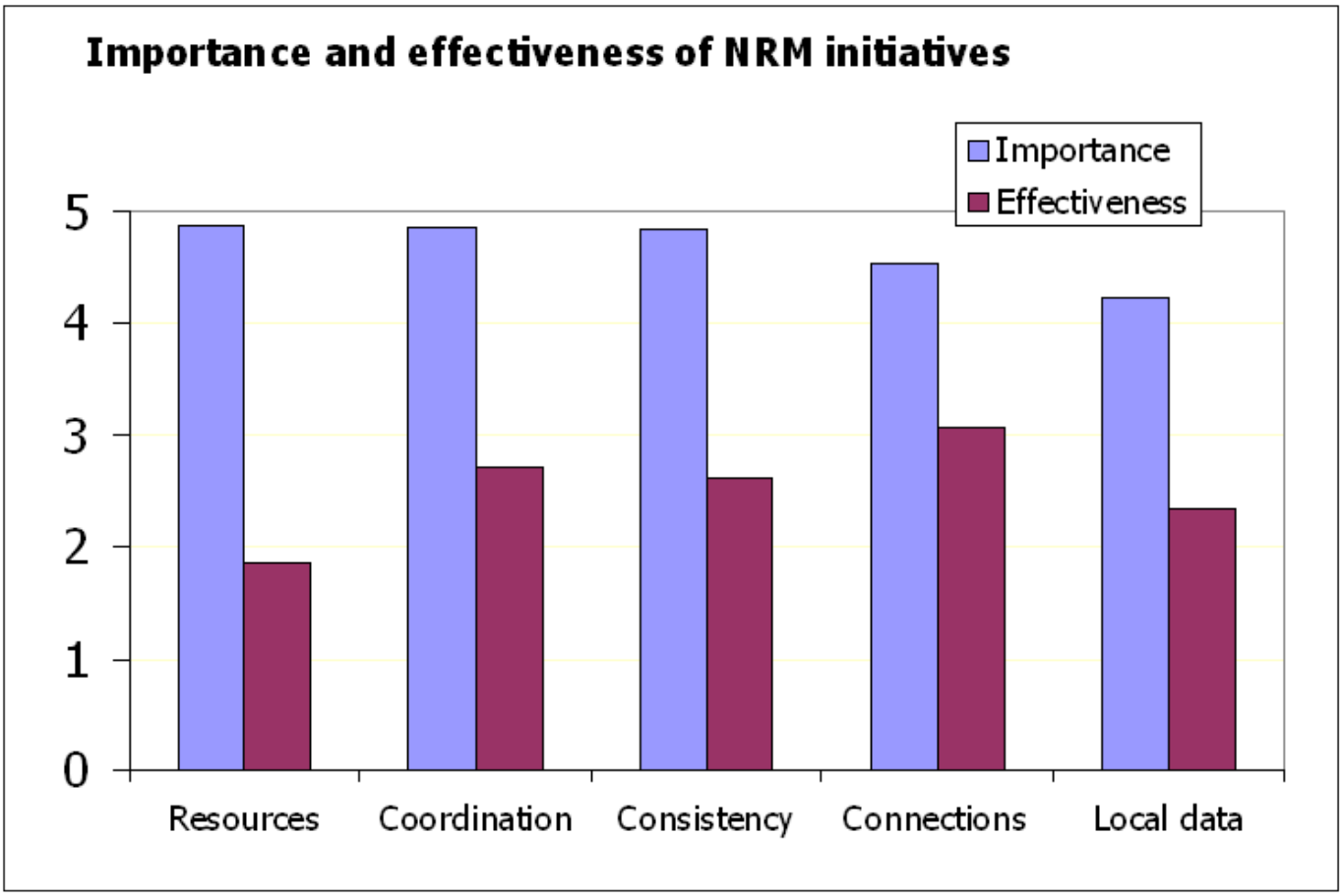

Figure 1 - Importance and effectiveness of NRM initiatives

Figure 1 shows that resource issues are the most important and ineffective of these five generic NRM issues. Most respondents considered the resourcing of LG for NRM roles to be either completely ineffective, or ineffective.

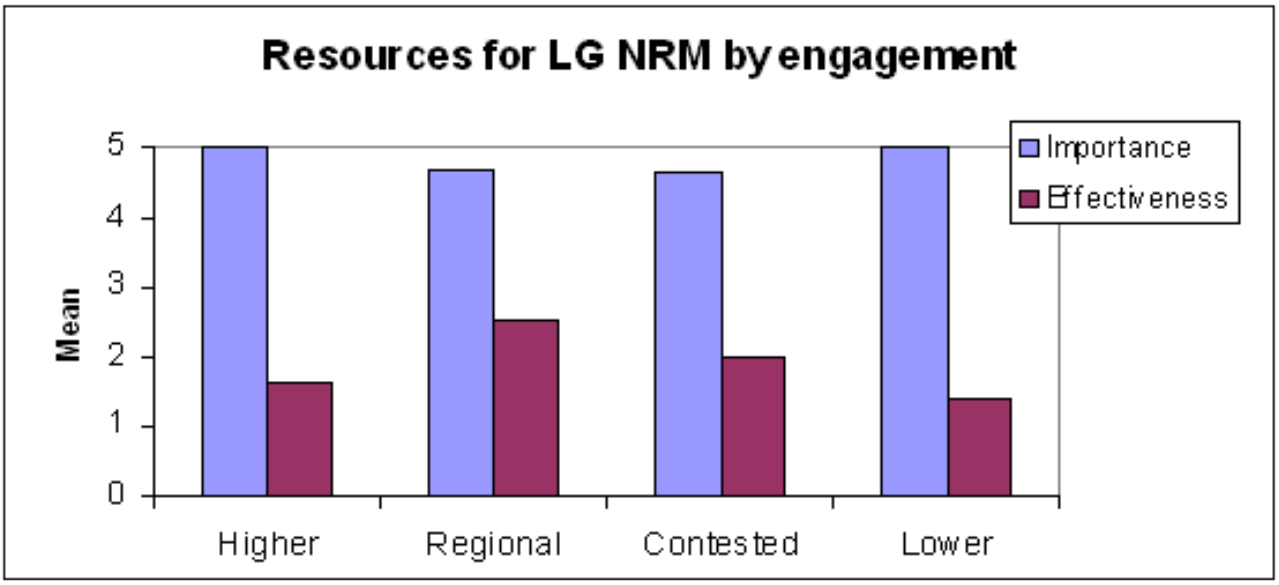

Figure 2 – Resources for LG NRM by engagement

Figure 2 suggests that there may be differences in resource pressures due to engagement in NRM initiatives. Regional organisations perceive less problems than LGs. The least engaged LGs perceive the greatest problems.

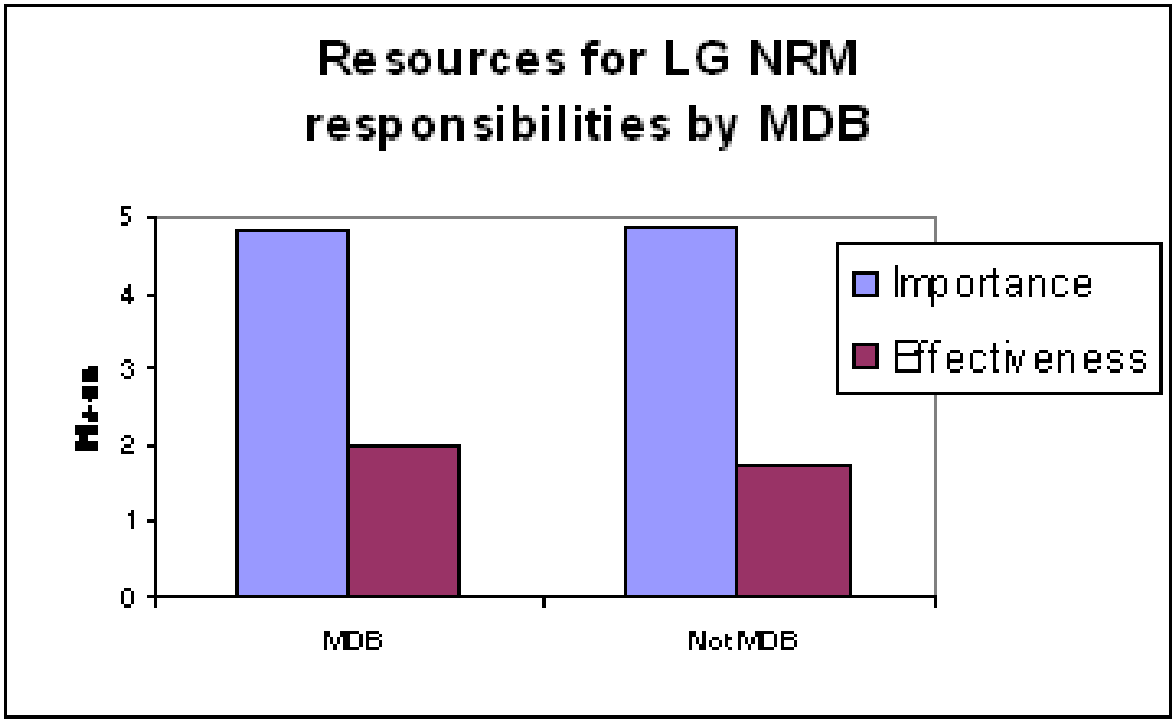

Figure 3 - Resources for local government natural resource management by Murray Darling Basin

Figure 3 shows little difference in perceptions of resource problems between agencies within and outside of the Murray Darling Basin. It may be that more resource problems may be experienced outside of that area.

Extended analysis of resource issues

The results in Figure 1 suggest that resources are the most significant of the problems explored through gap analysis. Resource problems were also repeatedly brought up in answers to other

survey questions irrespective of whether the questions were intended to target resources. Because of its over-riding importance, and the degree to which resource problems are integrated with the other NRM concerns, the analysis here extends beyond the responses to this gap analysis question and incorporates statements from other parts of the survey. In doing so it aims for a comprehensive report of resource issues as they affect local and regional practitioners. The steps involved in ensuring a comprehensive coverage of resource issues in this report were as follows:

- complete coding of responses to the gap analysis questions on resources to establish analytical categories;

- further searching across all interviews and interview questions for any use of the terms *resource, fund, money* (excluding the responses that had already been coded). This search brought up 598 other statements on resource issues, which were then culled to those most relevant to the analytical categories already induced in this analysis; and

- complete coding of these additional resource issues, using the analytical categories already established for resources.

One result of this extended analysis is that far more individual responses are included in the quantitative summaries compared with those for the other gap analysis reports.

Another result of this intensive analysis was richness in the findings. Three independent dimensions, or broad analytical categories were induced compared with two for the other gap analysis issues. The coding was complete in that each quote was classified into all three of the broad categories. It was not mutually exclusive, so any individual quote may have been coded into more than one type of resource, or use of resources. This was because some statements clearly addressed multiple issues. The overall finding was that resource issues can be understood in relation to the following categories:

- **drivers and constraints by sphere interactions** – constraints between spheres, drivers between spheres, constraints within spheres and drivers within spheres;
- **types of resource** – money, knowledge, commitment, statutory authority, timing; and
- **uses for resources** – work, roles, people, infrastructure, plans.

The next section integrates results across all three of these analytical categories, drawing out the main interactions between different aspects of local NRM resource issues. This three-dimensional picture is necessarily somewhat complicated. To reduce confusion, the remaining three sections present detailed findings for each category in turn. This is a systematic review of findings, starting with the most commonly mentioned issues, and moving towards those that were mentioned more rarely. Definitions, quotes, images and a short discussion are included for each subcategory.

Integrated results

It is no secret, and no surprise, that a resource crisis currently faces LGs and constrains their NRM capacity. Indeed, cost shifting, devolution and unfunded mandates to LGs were the topic of a major inquiry by the Australian House of Representatives Standing Committee on Economics, Finance and Public Administration in 2003. The financial impact of this on LG is estimated at between $500m and $1.1b per annum (see references). What is not well understood beyond LG, is how this resource crisis is being experienced on the ground.

Resource shortfalls impact on local practitioners through their daily confrontations with physical signs that they are falling behind in their core business, as well as their growing suite of new responsibilities. Practitioners constantly see opportunities lost, and threats eventuate for the want of comparatively small financial inputs. This can seriously undermine their capacity to continue working in remote, difficult, uncompromising roles, in the face of ever increasing NRM challenges. This is heartbreaking for many, and can drive committed and talented individuals away from their NRM roles.

> "They don't realize that we don't have the capacity to prevent the environmental problems using our own resources. That should be a huge value. We can make changes that will save the environment. Like in NSW they are spending $500m to claw back over-allocated water. We can't get any money to avoid causing the problem in the first place. So in 20 years time we will be buying back water leases" *Northern Territory Local government group.*

Figure 4 shows an integrated picture of how resource issues are experienced by local and regional NRM practitioners. The horizontal axis of the bar chart is broken into the five resource types (money, knowledge etc.), while the uses to which resources are put are shown in the individual bars (work, roles etc.). The stacks within each bar show whether the issue was mentioned as a driver or a constraint to effective NRM action, and whether it arose within a single sphere of government, or through the interactions between spheres (driver within, constraint within etc). Table 2 – below the graph – gives a definition of the cross-cutting issue by summarising the common features of each quote counted within that section of the chart. The cells of the table also give links to the full quotes, so that readers can see what practitioners have said in relation to each of these issues.

Simpler charts and detailed discussions are included later for each of the three broad resource issue categories (resource drivers and constraints, types of resources and uses to which resources are put). The following features are worth noting from this integrated view of the whole picture of resource issues:

- the three broad categories are clearly independent of one another, since any combination of subcategories is possible;
- there are some strong associations between categories. *Money* for *work*, and *statutory authority* for *roles* are commonly associated resource types and uses. The implication is that money is needed for on-ground work to be achieved, and that *roles* can only be fulfilled with adequate statutory authority. In each case there

are major *constraints between spheres*, with the necessary resources not being provided;

- the most commonly mentioned resource issue is a *constraint between spheres* due to a lack of available *money* for doing practical *work*. This is usually when funding opportunities are potentially available (for example through the Natural Heritage Trust), but have not been delivered to address key local priorities; and
- constraints between spheres are common for all resource types and uses. However resources are more often mentioned as drivers between spheres in three areas. It seems that Australia's broad NRM policy framework is effectively delivering *money* for *plans*, and driving *commitments* for people to take up NRM *roles* within their local and regional organisations.

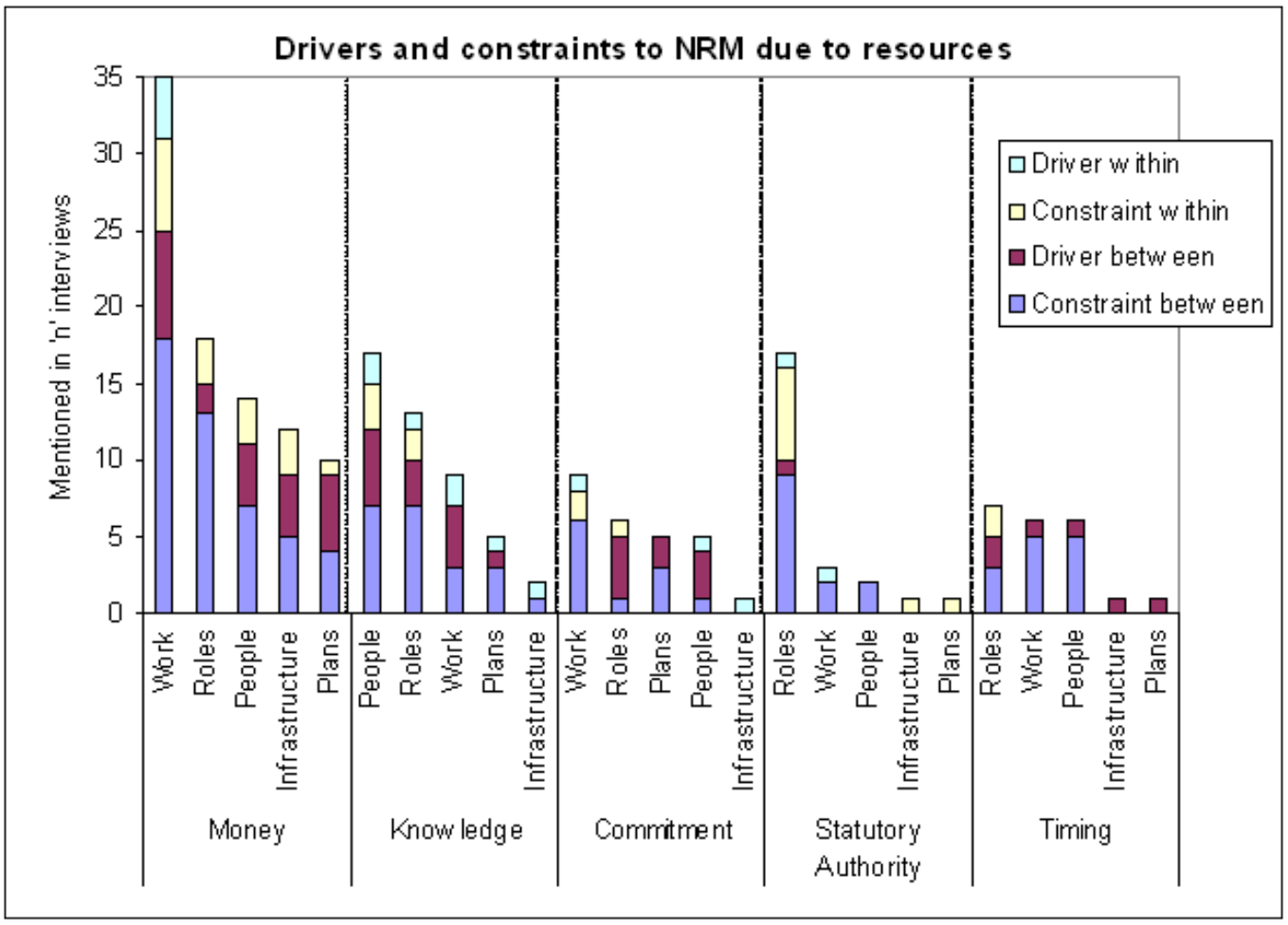

Figure 4 – Drivers and constraints to NRM due to resources

Table 2 – Types and uses for resources

Uses for resources						
		Work	**Roles**	**People**	**Infrastructure**	**Plans**

Uses for resources						
Type of Resource	**Money**	Enough cash to get the job done	Enough cash for the formal roles	The money to employ skilled people	Money to build the required infrastructure	Money to invest in developing plans
	Knowledge	Knowing how to do the practical work	Knowing what roles are required	People with the required knowledge	Knowing how to construct the infrastructure	Knowledge about what is in the plans, or needs to be
	Commitment	The intention to get the work done	Agencies have the intention to fulfill their expected roles	People are committed to the NRM tasks	The intention to construct or maintain infrastructure	Commitment to develop or implement plans
	Statutory Authority	A clear statutory authority for practical work	Roles clearly defined by statute or strong, clear policy	Skilled people are supported by statutory authority	Statutory requirement to provide infrastructure	Statutory authority or requirement to make or implement NRM plans
	Timing	Sufficient, or right moment in time to get work done	Suitable roles and good timing	People have sufficient time, or are there at the right time	Infrastructure provided at the right time	Plans are well timed

Drivers and constraints of NRM resource allocation

Each of the first four inside-out reports focuses on a generic NRM issue that was addressed through the gap analysis survey. The reports cover coordination between spheres, consistency between local and broader plans, local contributions to regional and national databases, and this one on the resources needed to fulfill NRM local roles between spheres. In each case, the major themes of

drivers and *constraints within* and *between* spheres of government was a meaningful and rich focus for analysis. The report on LG analytical themes includes a detailed discussion of these categories, including their research origins, and overall patterns across each of these first four inside-out reports. Refer to that report for a discussion of these major themes. Meanwhile, Table 3 below defines, and shows the relationship between the four categories to help clarify their use in this report.

In relation to resources, it is worth noting that, as with other generic NRM issues:

- constraints occurring between spheres were most commonly reported, and comprised half of all statements;
- next most common were drivers between spheres, followed by constraints within and finally drivers within spheres; and
- the proportion of statements within each category was very similar between the four NRM issues.

Table 3 – Defining drivers and constraints by sphere interactions

	Between	**Within**
Constraint	**Constraint between** – a force stopping or hindering, and originating or impacting across spheres of government.	**Constraint within –** a force stopping or hindering, whose origin and impact are restricted to one sphere of government.
Driver	**Driver between** – a force causing or helping NRM, and originating or impacting across spheres of government.	**Driver within –** a force causing or helping NRM, whose origin and impact are restricted to one sphere of government.

Figure 5 shows the results for drivers and constraints by sphere interactions for resources. The main finding about sphere interactions for resources is that the patterns here are almost identical to those for sphere interactions overall (discussed in the LG analytical themes report). Resource issues therefore seem typical of other NRM challenges in how the spheres interact, and whether they are helping or hindering one another's NRM work.

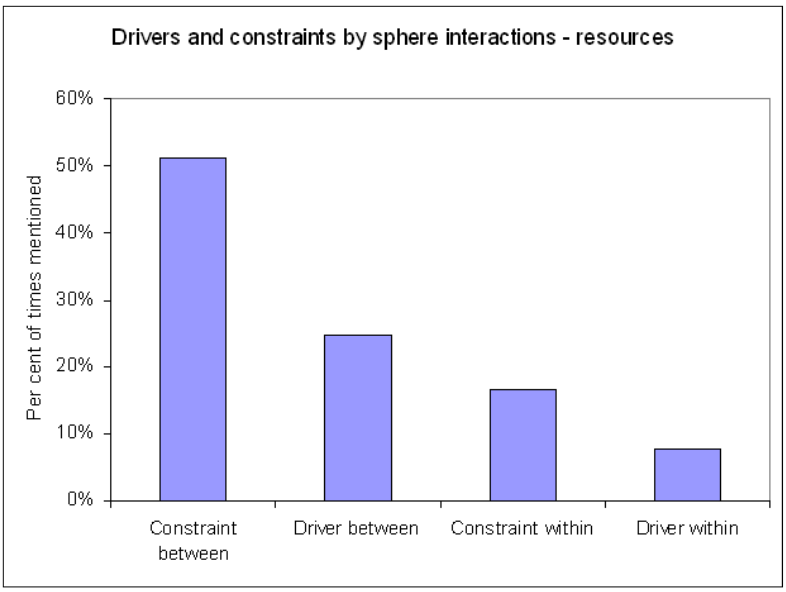

Figure 5 – Drivers and constraints by sphere interactions - resources

Detailed results for types of resources

The types of resources involved in NRM within rural Australia can be explained through five categories – money, knowledge, commitment, statutory authority and timing. Achieving any NRM outcome relies on the availability of one or more of these resources, suited to the specific problem being tackled. The five resource types, and their current operation across Australia are described below, but first it is worth reviewing the relative importance of each resource type, based on the number of times they were mentioned.

Figure 6 shows the number of times each resource type was mentioned. Money was the most commonly mentioned resource, and was mentioned nearly 90 times, or about twice in each interview. This was also twice as often as the next most commonly mentioned resource, knowledge. Commitment, statutory authority and timing were each mentioned between twenty and thirty times. While numerically less commonly mentioned, they were still often the key to successful NRM initiatives, as is shown in the following discussion of each variable in turn.

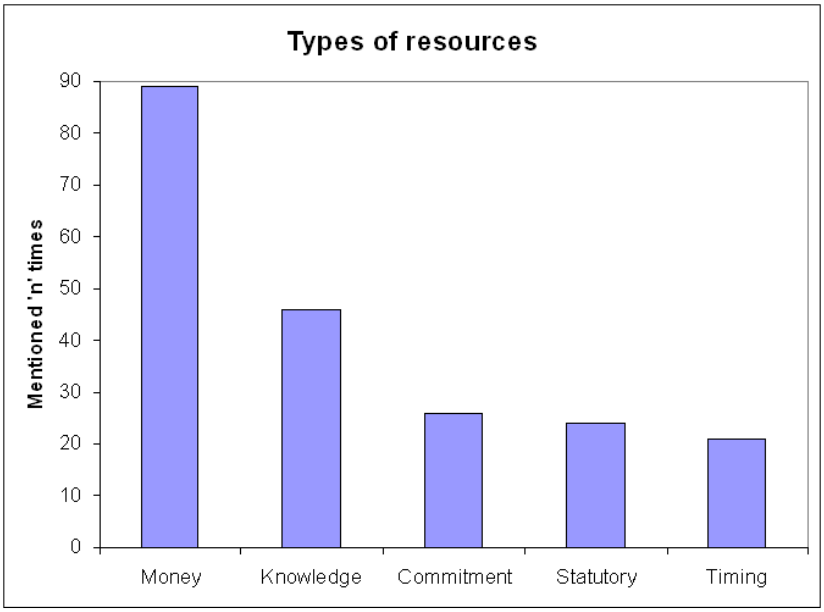

Figure 6 - types of resources

Money

> "One of the real problems is that no one will fund you to keep a pristine area clean. As soon as there is an outbreak of noxious weeds you can get funding. All of the money goes to solve existing problems and none goes into protecting against problems. I feel like going and planting weeds in areas that need other work done, and then getting the weeds money and using it for fixing up other things." *Indigenous LG environment manager*.

The analytical category, *money* is defined as "cash available to invest in achieving NRM outcomes, which may be flexible, tied to specific initiatives, raised through rates or received through grants."

When *money* was mentioned by NRM practitioners it was usually in relation to sources of funds that tantalise by being available in theory, but not in practice. Natural Heritage Trust (NHT) 1 for instance was widely appreciated as a source of funds, but commonly criticised for being like a lottery – its allocation to projects appearing random rather than strategic. NHT 2 is eagerly and optimistically anticipated because of widespread perceptions that it is adopting a far more strategic approach. However frustrations abound over funding delays and perceived gaps or inconsistencies in allowable or priority projects.

> "The new programs are like a lottery. You put in for funding that seems appropriate, but you don't get the funds. Then there's nothing you can do about it. The LG Association doesn't help, and there is no recourse through the funding agencies." *Southern New South Wales LG Group.*

Some common themes in relation to *money* that were related within Resilience interviews have been addressed in other reports, but remain pressing, unresolved problems. They include:

- LGs are well placed to play key roles in achieving NRM outcomes – they have the physical locations, the machinery, statutory status, and interest in doing NRM work;
- LGs are chronically under-funded, and the situation is getting worse. This is partly because their NRM roles are increasing without a matching rise in core, ongoing funds. It is also because many NRM problems are worsening, despite the efforts of various NRM agencies;
- LGs are a responsible sphere of government. Australian LGs have far more checks and balances to ensure their financial, political and social accountability than do regional organisations. For the most part, they can be trusted to independently identify priorities, administer funds and undertake work towards NRM goals; and
- When a LG is able to employ an environmental professional, their NRM capacity increases dramatically (see *people* below). Such a professional can be shared between LGs, but must have a long-term budget and contract for their efforts to be truly effective. (See also Australian House of Representatives Standing Committee on

Economics, Finance and Public Administration, 2003; Australian Local Government Association 2003; Osborn and Cutts 1995; Wild River 2003 in references.)

Knowledge

> "They need to filter out the background noise, because otherwise it is overwhelming. Our council meets once a week, and trying to get 20 minutes of their time to talk about an NRM issue is a big ask. That's your window of opportunity to make a difference. I have been trying to get a presentation to council for 6 months now, and haven't had a space." *North Queensland LG Environment Manager.*

The analytical category *knowledge* is defined as "an understanding of how to proceed towards NRM outcomes, comprising both actions and the context in which they are performed."

The resource of *knowledge* was mentioned on average once per interview, most often that a lack of *knowledge* was impacting as a constraint, but also commonly as a driver. Local knowledge was frequently considered valuable, was viewed as being to be present among the LG or community. The role of LG in educating the community was also noted:

> "Probably the biggest issue is that we have to show the communities that you can enhance your local environment and still sustain farming practices. I'm not sure at the moment that we are really doing that, but its probably the key to the whole lot of it. If you are spending money on natural resource issues then your water quality will improve, and then you won't get the erosion. We need to teach people that we are on the right track." *Western Victorian LG group.*

Commitment

> "The thing that we do continually refer back to is the regional catchment strategy. And I suppose that if we thought that was wrong we wouldn't do that. So there is a commitment to that strategy." *Eastern Victorian LG Environment Manager.*

The analytical category of *commitment* is defined as "the political and personal will and commitment to achieve NRM outcomes, including the support of council the community and/or a relevant plan or policy."

Interviewees commonly mentioned the resource type *commitments* in relation to four of the five uses for resources: *work*, *roles*, *plans* and *people*. No *drivers between spheres* were mentioned for the *intention* to do *work*. A commonly mentioned *constraint* is the different intentions of neighbouring Catchment Management Authorities (CMAs).

> "We have a huge issue in this shire, that we straddle two CMAs. One CMA says an issue is critically important, and they will fund us for it, and the other might not have it as a priority. This leaves us in between. Will we do the work just in the area that has funded us?" *Eastern Victorian LG group*

In contrast, the *commitment* to take up NRM *roles* was most often reported as having been *driven* by other *spheres*. The following quote from a LG Chief Executive Officer suggests that a regional CMA might successfully target LG managers as a way to influence LGs and get them more involved in NRM initiatives. Note how this managers first thought is *money*, but the other resource of *commitment* follows quickly.

> "Money, it's always down to money. But it's also priorities. If council sees it as a priority of high importance, then they will get involved. And that gets down to how it is promoted to councils and whether that is done from the inside or the outside. When a CEO sees the environment as important, then the council and the council officers get involved. Otherwise, it doesn't get much attention." *South Australian LG CEO*.

Statutory authority

> "Councils sometimes feel uneasy dealing with non-regulatory bodies that are sort of masquerading as.... I don't know what. Local governments have very clear statutory obligations. Then you go from that model to the CMA people who are not regulatory, they have no regulatory backing. They are sort of fuzzy. Now the NAP [National Action Plan for Salinity and Water Quality] stuff has created these sort of super regional organizations that still don't have any statutory backing, and up until now didn't even have proper funding, but were there as this player that we are supposed to deal with." *Southern Queensland Regional NRM Facilitator.*

The analytical category of *statutory authority* is defined as "a head of power or legal requirement for the local or regional organisation to take NRM actions."

Statutory authority was almost always mentioned in relation to *roles*, and as a *constraint* to effective NRM. The key issues are that LG is well placed to take on many NRM roles, but it lacks an optimal statutory framework for effectively undertaking NRM tasks. The financial constraints on LG make it wiser for LGs to delay taking on new NRM roles, or even to participate in scoping out the optimal roles for LG. After all, with devolution and cost-shifting in recent decades it is most likely that by opting into new roles, LGs will be left with ever increasing unfunded mandates.

> "I can see the writing on the wall with weeds. But a lot of the staff in the Mallee have been put off because funds are being held back. Meanwhile I am putting a grant application in to do a weeds strategy, and that isn't requiring any LG funding. It might end up being a local government role with the state government department playing a part in enforcement. Personally I don't want local government to be responsible for weeds, but I don't know if they should be or not." *Eastern Victorian LG group.*

Timing

> "I have been in the role for 1 year, and have 2 to go. It is quite a long time in the environment field. A three year contract is long here. Most of the local level coordinators have such uncertain arrangements, and they have all of these interim funding agreements with 3 and 6 month extensions. A lot of people have left and moved on as a result of that. Others are getting disillusioned about their work because of this." *North Queensland Regional NRM Facilitator*.

The analytical category of *timing* is defined as "either the available time or the right timing for undertaking successful NRM actions."

Timing was most often mentioned in relation to roles, work and people, and generally as a constraint between spheres. The most moving and tragic story told to Resilience was in relation to timing and people. It focused on the potential human cost of short-term NRM funding.

> "the experience at [a small indigenous community] was having a good CDEP [Community Development Employment Program] coordinator, and we got Landcare made into a line item in CDEP, so there was a budget for Landcare. And then we did one project after another, and all the guys would get on with it even when there was no-one there supervising them. That Landcare project got funded from all over the place, and one project was from the NHT. So they spent three years building capacity, and having ownership, and then suddenly there were no more funding options left that hadn't been used, so it couldn't go on. The people got so disappointed. Three of them have suicided. Since then I have really been worried about getting involved in any of those short-term programs, because those people were very committed when they were involved in that. It's not capacity building unless it really goes onto something else." *Northern Territory Indigenous Regional Organisation/ Indigenous LG.*

When timing was mentioned as a driver between spheres it was most often that a regional NRM agency had a budget surplus to be used by a particular time, and the LG was able to make use of the money immediately. This reinforces the claim that LGs are well placed to take on NRM challenges, and are ready and willing to do so if only finances are not a constraint.

> "The CMA has suddenly found $80,000 that they couldn't otherwise use this year. We have a project that allows us to spend it this year, and that helps us a lot. I try to make sure that I have other funding for all of my environmental projects from other sources." *Eastern Victorian LG Manager.*

Detailed results for uses to which resources are put

The discussion now moves on from the analytical category of *types of resources* to the *uses to which resources are put.* These *uses* can be explained by five analytical categories. Any type of resource may be applied to achieve any one of these purposes. (However some associations between types and purposes of resources are more common than others – as discussed under *integrated results* above). The five uses for resources are described below, but first it is worth reviewing the relative importance of each use, based on the number of times they were mentioned in interviews. Figure 7 presents the results in a bar chart.

Resources for work and roles were mentioned most often. This relates to resources for achieving practical, on-ground outcomes related to LGs' clear and fitting NRM roles. The next most frequently mentioned category was people, and the key here is skilled, committed people, particularly if they will be able to stay in their roles for several years. Plans and infrastructure were the least commonly mentioned uses for NRM resources.

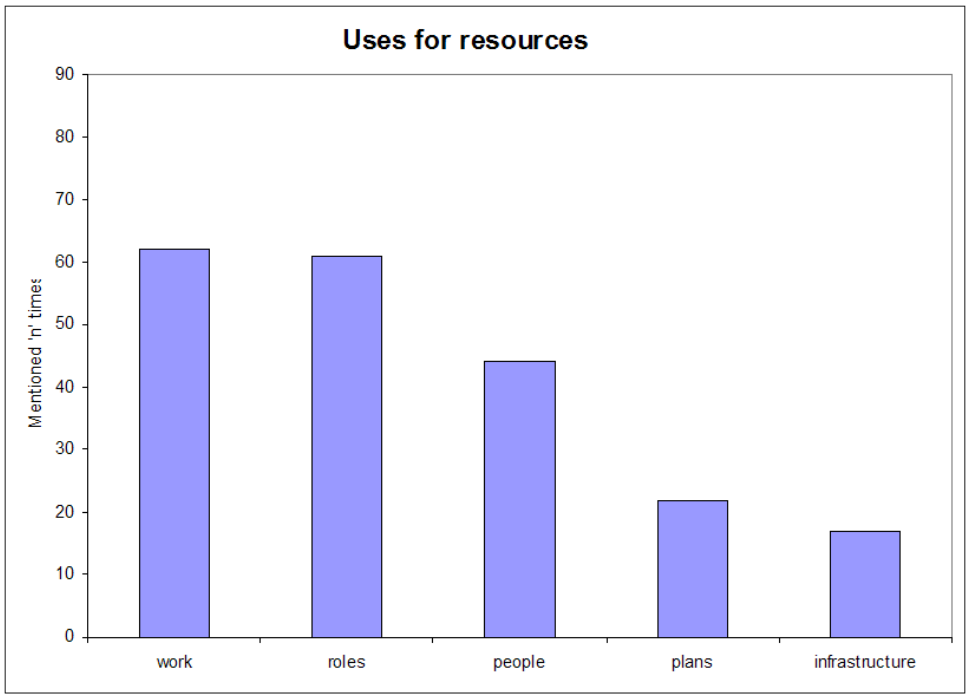

Figure 7 - Uses for resources

Work

> "It's very hard to satisfy the landholders, because they say "if you are serious about Landcare and the environment then give us some money for it". But I can't get money for that. However, I can get money to give school kids a camera and take them on a bus to educate them. That's fun, and we could get those projects funded every month. But we can't get the big work done. We have to word our applications up so that it tricks them. It's a bit sad if they are really serious about the environmental issues." *Western Australian Wheatbelt, LG Group.*

The definition for the analytical category of *work* is "the practical, on-ground work that has a definite impact on NRM problems."

Local practitioners identify many constraints in the resource base available to do practical work. A core problem is that there is just too much work to be done within available resources. A second problem is that money appears to be spent on low priority NRM work, and so this looks like resources are being wasted. Many people are supportive of the commitment for regional NRM plans to drive future NRM resource allocation, as they anticipate that this will reduce the resource allocation to low priority work, but the lengthy planning phase for NHT 2 has caused frustration. Practitioners are increasingly aware that even if resource allocation became more strategic, and targeted towards priority work, there are still not enough resources to address all of the highest priority problems – let alone the emerging problems.

Roles

> "With catchment management we tend to be looking at the water quality. We tend to be pointing the finger at certain industries and certain people. I've been pushing for a while to get some funding to sample say stormwater outlets. It's almost impossible to get. And yet funding to sample rivers is pretty easy to get. We have no evidence to point to the businesses and homes in the town to say that their stormwater is affecting the river quality. They happily point their fingers at the cotton growers. I don't really want to prosecute anyone about this, but just let them know. There are 4 stormwater outlets in town, and it would be great to be able to

assess and compare the quality of the water that comes out of them into the river." *Western Victorian LG environmental manager*

The definition for the analytical category of *roles* is "the formal, statutory responsibility for undertaking specific NRM actions".

Australian LGs have had clear statutory roles since 1838 (although LG origins differ by state. See Power et al 1981 in references). LGs are often (quite sensibly) structured around their historical statutory roles – for example they have statutory responsibilities for planning, and these roles are filled by officials within LG planning departments. LGs have few if any formal statutory roles for NRM, and therefore most still lack an NRM department. Instead, NRM roles are spread throughout council, with some responsibilities held by planners, others by environmental health officers, and others by engineers or even chief executive officers. When LGs lack a dedicated environmental professional on their staff, they can rarely stay abreast of emerging NRM priorities, educate relevant staff and councillors of NRM issues or successfully apply for NRM funding to take part in regional initiatives. It is irrational for LGs to volunteer for optional NRM roles – for example by declaring weeds of local significance – since the most likely outcome is an increase in unfunded work for council.

LGs also need to achieve a fine balance in many of their environmental and other roles. For a specific issue – such as stormwater management – they may simultaneously be:

- operators of infrastructure (eg stormwater systems);
- educators of local operators (eg of what may safely be flushed to stormwater); and
- enforcers of local or state laws (eg issuing on-the-spot fines for stormwater pollution).

Often in rural shires, a single officer may be responsible for all three roles. That officer will also be a neighbour, friend, relative, or professional associate of the local operators who are on the receiving end of these roles. It can be very stressful and complicated for the LG officials involved in these multiple roles. No wonder LGs are sometimes reluctant to extend their roles further, or to volunteer for new initiatives proposed by regional NRM agencies.

In contrast to LGs, NRM regional agencies still lack almost any formal statutory roles. LGs remain unconvinced that the regional NRM agencies will either achieve a significant statutory status, or remain in place for long enough to make a real difference. The initiatives of these agencies are often presented as exciting new ideas, but new ideas are often distrusted. Landholders as well as many LGs know that many current NRM problems that are the result of previous new ideas from government experts. They would prefer to see strategic, rather than innovative actions.

> "One of the reasons that governments are taken so un-seriously in the bush is that in the past, departments have suggested that people plant the plants that are now weeds, for example land grants in Margaret River depended on people getting rid of all the trees. Bitou Bush was suggested for planting around here. Farmers have long memories, and they remember that. Local government has higher credibility, and they stay around and remember these things as well." *Northern New South Wales LG Chief Executive Officer (ex Western Australian).*

People

> "Yes, resources are critical, but there are a number of examples of LGs without a big funding base or staff who have done excellent things. If every council in our catchment had an environment officer, more would be done. Willingness and drive are more important." *Western Victorian Regional NRM Facilitator.*

The analytical category of *people* working on local NRM issues is defined as "knowledgeable, skilled, committed people with regular, up-to-date connections with environmental issues and broader communities of experts. They may be LG councillors, officers, managers, community members and may work on either a local or regional basis, servicing several LGs."

People are a central NRM resource in local areas. The quote above mentions LGs that achieved excellent NRM outcomes without a funding base or staff, but in these cases the outcomes are driven by councillors, local community members or others not on the council payroll. People are often passionately engaged in local NRM initiatives, as shown by the success of the Landcare movement in recent years, and very many local environmental successes (see Wild River and others 2002 in references). People with strong environmental commitments were mentioned several times in interviews as *drivers* both *between* and *within spheres* of government. When people are mentioned as a *constraint*, it is generally when funds are unavailable to attract and retain good staff, or when long timeframes for projects erode the capacity of volunteer community members to follow through on their commitment.

Plans

> "Bureaucrats from every government department are getting so into policies, plans and milestones. At a local government level we are mandated to have plans – business plans, strategic plans and the rest. We have so many levels of government that are all needing their plans as well so they are all developing plans. Every group that is funded, like all of the indigenous organisations, are developing separate plans. I have been pleading to move from having umpteen plans to having one plan. I think we need the plans. But there should be enough flexibility so that a local plan should be able to be fitted into the broad plan." *Northern Territory Indigenous LG Environmental Manager / Regional Facilitator.*

The analytical category of NRM *plans* is defined as "a scheme of action or procedure, including statements of priorities and milestones for achieving outcomes."

As is noted in the above quote, LGs have statutory requirements to prepare many plans, and little encouragement or reward for consolidating the different plans they produce. LGs face coordination and resourcing challenges in simply meeting their statutory requirements to produce their own plans. Those plans must also generally be produced, approved, and renewed within timeframes established by state government regulations. The relevant regulations are publicly available, and not open to amendment by LGs. Meanwhile, regional NRM agencies are currently working towards a new set of regional NRM plans, which are intended as the national vehicles for assigning future funding under the Natural Heritage Trust 2. LGs have been encouraged and expected to participate in this planning process, and to align their own plans with these new NRM plans. Yet LGs report nationally that the statutory timeframes within which their plans are produced have not been taken account of in the new plans. This has added significantly to LG capacity to contribute to plans, and to ensure consistency between LG and regional plans.

Infrastructure

> "It seems that there is a lot of money around for reports and research, but not much for actual environmental protection.... If the report says that you need to go and build a jetty or something to protect the beachline, or a viewing platform, then the outcome should be that you get the money to go and do the viewing platform." *Western Australian LG CEO, coastal council.*

Infrastructure is defined as "the buildings or permanent installations associated with an organisation or operation".

Infrastructure was usually mentioned in interviews in relation to money, generally that there is not enough money around to maintain existing infrastructure, and trade-offs are necessary if new infrastructure is to be installed. Basic infrastructure like roads, sewage treatment plants and approved landfills are extremely expensive. Funding programs like 'roads to recovery' provide LGs with funds towards this basic infrastructure, but will rarely cover the costs of ensuring sound NRM associated with it. For instance, road edges are a major location for weed spread, and newly developed road edges need a lot of work to prevent weed infestation. Road grants do not cover the costs of replanting road edges with native vegetation to prevent initial weed infestation, or the long-term maintenance of weed-free roadsides.

Chapter 10: Water, catchment and regional initiatives

Resilience – inside-out report 10

By Dr Su Wild River,

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> "When I worked for SG, I didn't even see LG as important to my work. It was a really rude shock when I started to work in LG to see the important role they play, and now I do get frustrated. We have a good relationship with some of the SG people, but not actually at the catchment management level, and with them I often get the feeling that they are just ticking a box by 'consulting' with me. I have heard many Councillors say that they would do away with SG altogether, and just have LG." *Eastern Victorian LG Group*

Executive summary

Waterways and catchments have long been recognised in Australia as defining ideal natural boundaries for strategic natural resource management (NRM). This recognition has inspired several generations of attempts to integrate NRM initiatives within regions that are based on catchments. Integrated Catchment Management (ICM) in the Murray Darling Basin (MDB) for instance, has been transformed into the current regional arrangements for NRM that are focused through the Natural Heritage Trust (NHT).

The Murray-Darling River system flows through four Australian states – Queensland, New South Wales, Victoria and South Australia. Each of these states has taken a different approach to incorporating previous regional arrangements for NRM into their current forms. One common and enduring theme is the recognition by both state and regional bodies that LG is an important partner for achieving NRM successes. An equally common theme is uncertainty about how to incorporate LG bodies into regional NRM programs.

This report focuses on local and regional NRM practitioner views on the effectiveness of NRM initiatives involving regional NRM agencies that are often based around rivers, catchments, or otherwise focused on those landscape features. It identifies seven major types of initiatives that practitioners describe as being applied to NRM at regional levels. It also discusses the current effectiveness of each initiative in achieving NRM outcomes. Note that these initiatives might also be considered as resources or other features of NRM in other contexts, and are discussed in that way in other *Resilience* reports. Their definitions are consistent here with their use in the other *Resilience* reports, but here the focus is on each one's contribution to taking the first organised step towards NRM goals.

The seven types of initiatives are described throughout this report in order of importance, based on how many times they were mentioned during interviews. The initiatives are:

- Connections;
- Coordination;
- Institutional frameworks;
- Knowledge;
- Time;
- People; and
- Money.

Most of these initiatives are generally described as being applied ineffectively for NRM outcomes. Knowledge and people are the exceptions, with practitioners most often describing them as being applied effectively. The initiative of making connections between agencies involved in NRM was mentioned most often by all groups interviewed. It therefore seems to be the most important potential contribution from regional arrangements – although it is only considered to be effective half of the time.

The relative importance of each other initiative is perceived differently depending on the context within which practitioners are working. Practitioners within the MDB for instance had a greater emphasis than others on connections, people and knowledge. LG practitioners emphasised both connections and coordination, while those in regional NRM agencies had a fairly consistent focus across most of the initiatives. People with facilitating perspectives – who work across spheres of government – have a different emphasis on this range of initiatives than do people with inside perspectives, who have only worked in LG agencies. Facilitators saw connections, institutional frameworks, knowledge and time as key initiatives for NRM. Insiders placed a greater emphasis on coordination, people and money.

Background to the water, catchments and regional initiatives report

Resilience is a Land & Water Australia project aiming to enhance rural local government (LG) capacity in natural resource management (NRM). Its focus is on enhancing the understanding that different spheres of government have of one another generally, and of NRM efforts in particular. Resilience is working with 28 local governments – four from each state. All participating LGs face serious, multiple NRM challenges, and have mixed levels of prior engagement in regional, state and national NRM initiatives.

This report came from an intention to produce a commentary on LGs and water in Australia. As a first step, all interview data collected from local and regional practitioners were searched for the terms *water, ICM* and *catchments.* Comments on the Natural Heritage Trust (NHT), and other regional initiatives were later included because a great many of these comments were also relevant to contemporary regional initiatives. These were also not the focus of other inside-out reports. Not covering the regional arrangements under the NHT would have left an important gap in the overall analysis, and the set of issues covered here makes a relatively coherent set of statements.

As well as using the whole-of-document searches on water, ICM and catchments, this report draws on all recorded responses to the following two survey questions:

- Are you satisfied with the roles that LGs are being offered, and playing in ICM, NHT [the Natural Heritage Trust] and NAP [the National Action Plan on Salinity and Water Quality]? and
- What have been the benefits and shortfalls of other NRM initiatives?

All of the statements gathered about these topics were coded in relation to two broad analytical categories of types of initiatives, and their effectiveness. The responses also showed variation depending on the context within which interviewees worked. So the results presented here focus on:

- type of initiative – connections, coordination, institutional frameworks, knowledge, people, time, money;
- effectiveness – ineffective, effective, unclear;
- whether the agency was located within or outside the Murray Darling Basin (MDB);
- what sphere of government they represented – local government or regional agency; and
- the perspective held by a respondent – inside or facilitating.

Note that there are a wide range of analytical categories under the heading of initiatives here. None of them are unique to NHT or ICM and all are also analysed in other *Resilience* reports. In those reports some are recognised as resources, or features of engagement, coordination or consistency. The definition of each concept is used consistently between reports, but here the emphasis is on how each helps with taking the first organised step towards an NRM outcome.

Although each of the concepts here are treated as initiatives, the discrete analytical category of initiatives did not really emerge from the data. Neither did the closely related category of 'plans, strategies and policies', which differs in referring to the formal statements that guide and underpin initiatives. Some of the comments made in these interviews talked of plans, and initiatives. But most had a focus of talking about the way that they were being implemented (or failing to be implemented) instead of on the initiatives and plans themselves. This then is a report on local and regional experiences of and ICM and NHT implementation, and not the inherent substance or context of the initiatives themselves.

Quantitative results

This section presents bar charts comparing the number of times that issues were raised in different contexts. It gives a very brief commentary on the results. More details are provided in the later sections of the report, each of which focus on a single NRM initiative, and give insights about what was learned from the full set of comments that were made about each.

Figure 1 shows the number of times that initiatives were described as either effective, ineffective or whether their effectiveness was unclear. Initiatives were most often described as being ineffective in achieving NRM outcomes – but many were also identified as effective. In many of the cases where effectiveness was unclear, practitioners were optimistic that new regional arrangements under NHT would eventually be effective. If this is the case, then effective regional initiatives may soon outweigh ineffective ones.

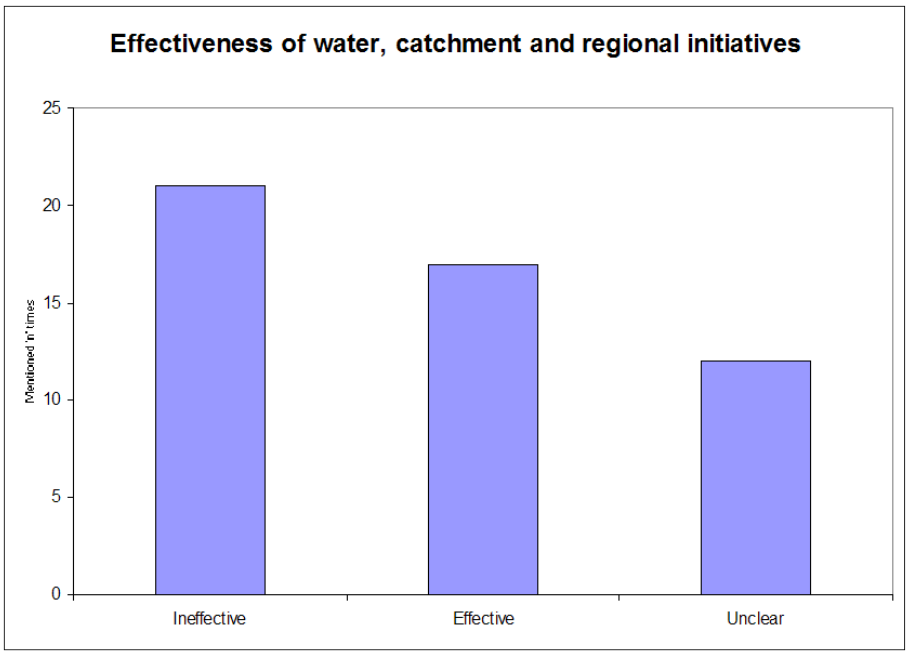

Figure 1 - Effectiveness of water, catchments and regional initiatives

Figure 2 shows the emphasis given to the different NRM initiatives within and outside of the MDB. The results were weighted equally, as if the same number of people had been interviewed in both of these locations. (See the methods report for details on numbers of interviews conducted with each characteristic). Practitioners within the MDB had a greater emphasis than others on connections, people and knowledge. The only initiative that those outside the MDB commented on more was institutional arrangements.

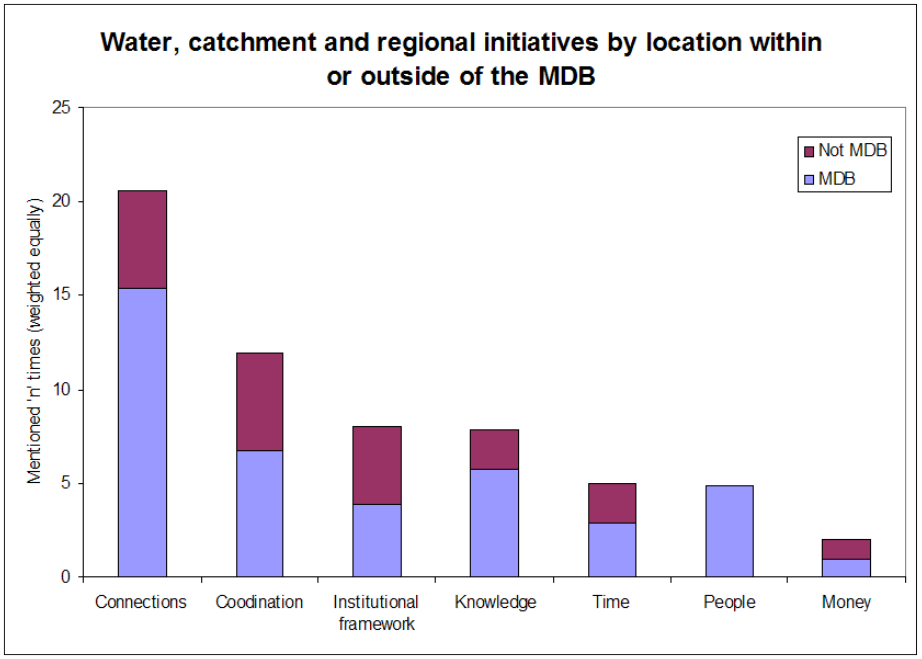

Figure 2 - Water, catchments and regional initiatives by MDB

Figure 3 shows the number of times that each initiative was mentioned by people working in different spheres of government. Again, the results were weighted equally as if the same number of people had been interviewed in each state. Compared with respondents working in regional NRM agencies, LG practitioners emphasised both connections and coordination. Regional agency officials had a fairly consistent focus across most of the initiatives.

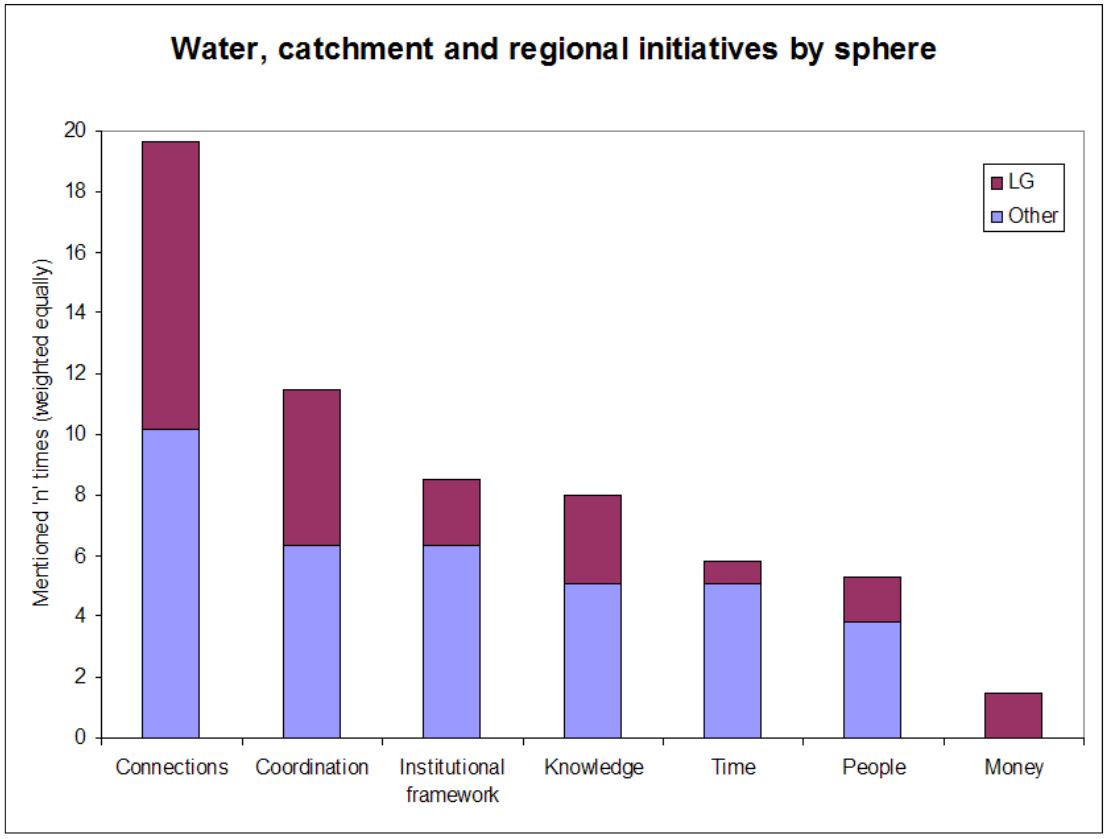

Figure 3 - Water, catchment and regional initiatives by sphere

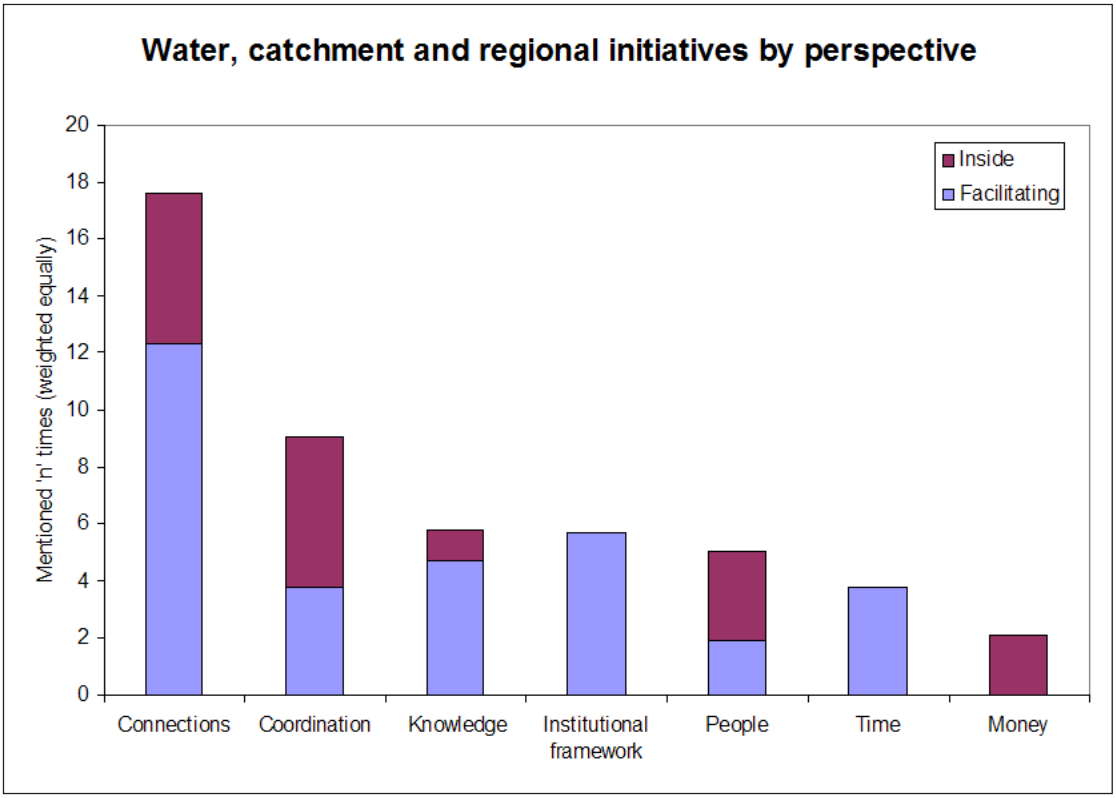

Figure 4 - Water, catchment and regional initiatives by perspective

Figure 4 shows the number of times that each initiative was mentioned by people with different perspectives. Perspective is an analytical category that describes someone's point of view, based on their experiences working in different spheres of government. People with *inside* perspectives have only worked in LG. They share a view that LGs are creatures and servants of local places and communities. *Outsiders* have only worked in state or Australian government agencies and have usually only been based in capital cities. They share the view the LGs are creatures and servants of the state governments. *Facilitators* have worked in LG and in at least one other sphere, many LGs in different places, or in organisations representing views of several LGs – such as LG Associations. They recognise that LG fulfils many conflicting roles, and find themselves in a position of negotiating between them (see the LG analytical themes report, or the journal article discussing these perspectives). The inside-out research did not target outsiders for interviews, and too few were recorded to allow reporting from that perspective.

People with facilitating perspectives have a different emphasis on this range of initiatives than do people with inside perspectives. Facilitators saw connections, institutional frameworks, knowledge and time as key features of NRM frameworks. Insiders placed a greater emphasis on coordination, people and money.

Figure 5 shows the relative effectiveness of each of the seven initiatives. Connections, coordination, institutional frameworks and time were all more commonly reported as ineffective than effective or unclear. Both knowledge and people were most often reported as being effectively applied.

Table 1 gives a brief definition of the intersection of each type of initiative with its effectiveness. In the electronic version of this report each cell is hotlinked to all of the quotes that were coded into that pair of categories. The next sections each discuss one of the initiatives in detail, starting with those that were mentioned most often.

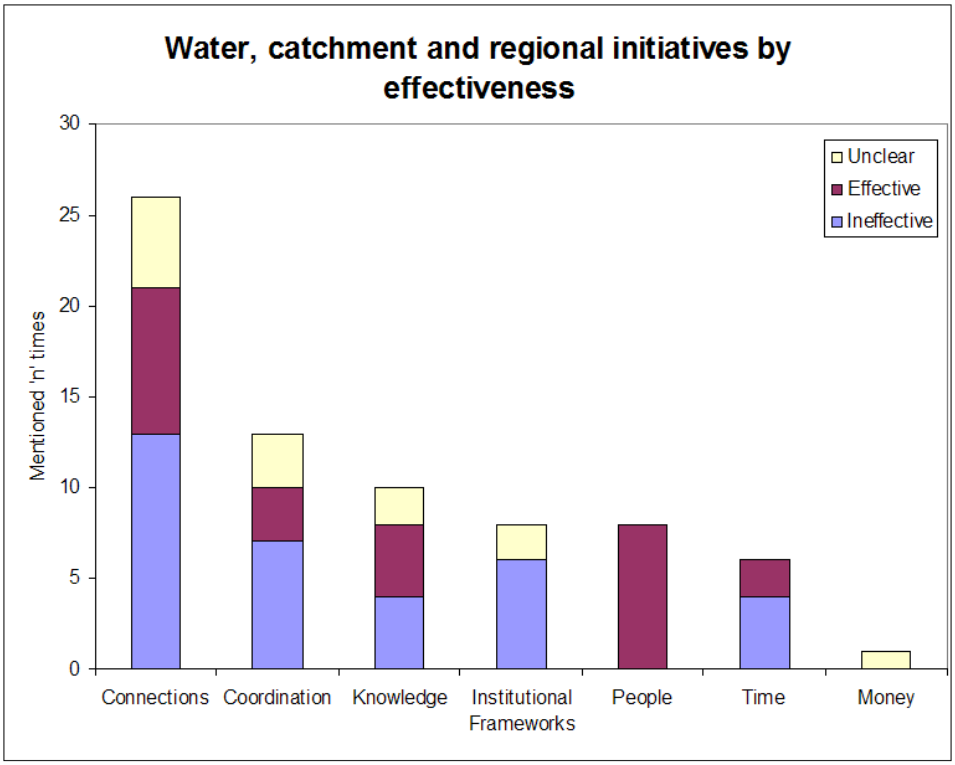

Figure 5 - Water, catchment and regional initiatives by effectiveness

Table 1 – Defining the effectiveness of water initiatives

	Ineffective	Effective	Unclear
Connections	Relationships between agencies are ineffective for water, catchment and regional initiatives	Relationships between agencies are effective for water, catchment and regional initiatives	It is unclear whether relationships between agencies are effective for for water, catchment and regional initiatives
Coordination	Agency responsibilities for water, catchment and regional initiatives are not working	Clear agency responsibilities for water, catchment and regional initiatives	Agency responsibilities for water, catchment and regional initiatives are unclear
Knowledge	People don't understand how to proceed towards water, catchment and regional initiatives	People understand how to proceed towards water, catchment and regional initiatives	It is unclear whether people understand how to proceed towards water, catchment and regional initiatives
Institutional frameworks	Organisations, customs and practices support water, catchment and regional initiatives	Organisations, customs and practices don't support water, catchment and regional initiatives	It is not clear whether organisations, customs and practices support water, catchment and regional initiatives
People	Knowledgeable, skilled people are not driving water, catchment and regional initiatives	Knowledgeable, skilled people are driving water, catchment and regional initiatives	It is not clear whether knowledgeable, skilled people are driving water, catchment and regional initiatives
Time	There is not enough time, or it is not the right time to implement water, catchment or regional issues	There is enough time, or it is the right time to implement water, catchment or regional issues	It is not clear whether there is enough time, or it is the right time to implement water, catchment or regional issues
Money	There is not enough cash to implement water, catchment or regional initiatives	There is enough cash to implement water, catchment or regional initiatives	It is not clear whether there is enough cash to implement water, catchment or regional initiatives

LWA, ANU43. Resilience, Inside Information.

Connections

> "It's going to happen more and more that the SG will aim for more input to DCPs, especially through the catchment management plans. Up to now we pass our development plan here, before the Catchment Management Authority (Catchment Management Authority) sees it, but there is more clout in the new NRM Act for NRM agencies to influence them." *South Australian LG Group within MDB*

The analytical category of *connections* is defined as "having practical and coherent relationships between NRM agencies".

Effective ways that connections are being achieved include:

- tying local plans to regional plans – incorporating LG priorities into regional plans, and regional priorities into local plans, acknowledging one-another's plans, and ensuring that draft plans are reviewed and supported by the other agency;
- tying regional plans to funding schemes – since this encourages LGs to pursue activities that are consistent with the regional NRM plans;
- involving LGs in directing NRM agencies – by including LG councillors on the NRM boards and working well with LG Associations; and
- sharing information – between agencies informally and regularly at the officer level, while ensuring that managers are kept informed of key issues.

Some examples of ineffective connections are:

- too many changes – an extended period of uncertainty in the boundaries, roles and management structures for new regional NRM arrangements has constrained their early effectiveness;
- failure to engage LG – for example by excluding councillors from NRM boards, or when the regional NRM agency officials do not understand LG and its broad-ranging roles;
- poorly defined roles – of NRM regional agencies, and of LG in relation to NRM;
- inconsistent boundaries – especially when LGs straddle several NRM agencies that are pursuing inconsistent priorities, and when regional NRM agencies are not aligned with one another; and
- regional agencies not respecting volunteer work – such as the work of land holders and Landcare groups in delivering NRM outcomes.

The issue of LG jurisdictions overlapping NRM regional boundaries is raised throughout the various initiative categories in this report. Outsiders may not realise that this is a problem. It would be logical to assume that because LGs are geographically smaller than regions, they would tend to lie

within, rather than across them. In some jurisdictions there has been a concerted effort to ensure that the boundaries match up. But in others – such as Victoria, the problem of LGs straddling NRM regions is quite common. Figure 6 below, from the *2006 National State of the Environment Report* highlights this issue. It shows that many Victorian LGs not only straddle regions, but quite a few straddle up to three of them. Clearly, there is a solid foundation to the concerns about regional straddling that are raised in interviews here.

[Figure – map of regional and LG boundaries from 2006 SoE report]

Coordination

> "Somewhere along the line there needs to be a feedback loop to the CMAs [Catchment Management Authorities], and we will have a fair role in that, with a working relationship pushing LG views back up the system. One of the strange anomalies at the moment is that the LGs write the SoE reports, but the CMAs are meant to be doing something about them. The catchment management plan process also has a reporting process back through the commission but there is a parallel reporting process on the state of environment reports. We don't cover stormwater, effluent etc in there, so we need to be working with local governments to ensure that that happens. There are also threatened species issues and others that we don't do here in the CMA, but that are part of NRM. The bulk of the National Action Plan money is salinity, so that restricts what we can do as a CMA and makes the councils particularly important players in the other environmental issues." *Northern New South Wales Regional NRM Agency Officer.*

The analytical category of *coordination* is defined as "clearly ascribed roles where all players know who is responsible for what".

Another whole Resilience report focuses on coordination between agencies. Concepts that help to explain coordination include clear responsibilities, connections and commitment. In each of these areas were many important constraints between spheres of government were identified as inhibiting coordination for effective NRM.

Good coordination and good connections are closely linked and clearly very important in achieving good NRM outcomes. The two approaches that are most often cited as helping to achieve both coordination and connections are ensuring that LG and regional agency plans are aligned, and formally involving LG officials in defining regional NRM agency directions. Coordination is reported to be ineffective when:

- plans or statutory requirements are not tied together;
- agencies do not know what others are doing;
- regional boundaries and LG boundaries do not line up; and
- funding is not available to the LG bodies that are responsible for NRM work.

Knowledge

> "I do see it as a role of trying to achieve better environmental outcomes. In small, predominantly rural councils, we have a challenge in convincing councilors – who are the policy makers – that we should be pursuing good environmental outcomes in conjunction with social and to a lesser extent economic benefits. I get frustrated seeing things being done in the past, and present, without thinking about the long-term consequences. In my early work, and university days, we would look at sustainability, although we didn't call it that. We were looking at ways to

make sure that rivers, dams, and any sort of water catchments were not developed to an extent that was going to impinge on their ability to supply water downstream. I find it frustrating that in Tasmania we are only looking at that now some 30 or 40 years later. This applies to a lot of Tasmania, they are not willing to learn from other states they need to reinvent the wheel." *Tasmanian LG Chief Executive Officer*

The analytical category of *knowledge* is defined as "an understanding of how to proceed towards NRM outcomes, comprising both actions and the context in which they are performed".

The statements recorded here of knowledge as an NRM initiative show an understanding that the complexity of NRM issues makes them hard to understand. But they also show frustration that some old knowledge has yet to be taken on by contemporary decision makers. The good news is that three out of the four comments about effective knowledge cited catchment management arrangements as effective in helping NRM officials to gain the knowledge needed to drive successful NRM initiatives.

Institutional framework

"We are in three catchments – including two main ones. It means that you think of your LG in two halves. Strangely they are more like the old LG boundaries before the amalgamations. But we tend to divide up as a council on those issues. If we are dealing with issues from one catchment, councilors from there deal with it. If it's with the other catchment, then those people do it. It's a very fraught thing. I don't have any easy relationship with the CMAs. For a start they seem to change their CEOs and personnel so often. LGs can take part on them, but life on LG these days doesn't really allow you to do much more than just be a councillor. Especially when our LG is so big, and it takes a long time to move between parts of the shire." *Western Victorian LG Mayor*

The analytical category of *institutional frameworks* is defined as "organisations, customs or practices that support coordination of NRM efforts".

Only people with facilitating perspectives – who work across spheres of government – mentioned institutional arrangements as initiatives relating to regional arrangements. And none of the comments that were pulled into this report described effective institutional frameworks for NRM. The main problems seem to be:

- poorly ascribed LG and/or regional boundaries that translate into poor organisational alignment;
- clear statutory obligations for LGs compared with poorly defined regional roles; and
- overly bureaucratic requirements of state or regional NRM agency funding schemes.

Time

> "Our timeframe doesn't try to work with local government timeframes. It's purely driven by ministerial processes, and not on-the-ground processes. That might change over time, but at the moment while it's starting up, our timeframes are set by Canberra bureaucracy. Once it all starts going we will hopefully fit in with local issues." *Northern New South Wales Regional NRM Officer*

The analytical category of *time* is defined as "either the available time or the right timing for undertaking successful NRM actions".

As with the quote above, the main concern raised here about time was that the various relevant timeframes for formalising the emerging regional NRM arrangements do not line up. Australian, state and local governments all have different timeframes, set by politics, statute or other factors.

The state and Australian governments have imposed these timeframes on the new regional NRM agencies, apparently without considering the statutory timeframes that LGs are required to work within for their own planning activities.

When the effectiveness of time was unclear, there was a sense of optimism among the quotes that the new regional NRM arrangements will get better with time, and more able to align with LG timeframes.

People

> "The person who is the link needs to sit in the council offices, and the LGs need to feel that they have ownership of that person. Not total ownership, but a strong ownership. In the our neighboring CMA, the LG person doesn't sit within a LG office, and because of that it's not as effective as here." *Southern Queensland Regional NRM Facilitator*

The analytical category of *people* is defined as "knowledgeable, skilled people with regular, up-to-date connections with environmental issues and broader communities of experts. They may be LG councillors, officers, managers, community members and may work on either a local or regional basis, servicing several LGs".

The initiative of having people work towards NRM outcomes at regional levels was only ever described as effective. Each of the people that was referred to work closely with both LG and regional NRM agencies. They may be located within either a local or regional agency, but they work

well with both. Many also work regularly with local Landcare groups, and other relevant community and government people.

Money

> "For the NHT funding requirements, we c2entralize it through the CMA [Catchment Management Authority] here. So then you can be assured that the projects that are being selected for CMA funding are in line with their strategy. But sometimes I think that projects that are put forward by the CMAs are given more preference than those that are put forward by others." *Eastern Victorian LG Environmental Manager*

The analytical category of *money* is defined as "cash available to invest in achieving NRM outcomes, which may be flexible, tied to specific initiatives, raised through rates or received through grants".

Only one quote was recorded here whose central message was about money. It reinforces the effectiveness of regional plans in driving LGs to coordinate and connect with the regional NRM initiatives. It also raises the question of whether LG funding bids are given enough funding support through NRM programs.

Chapter 11: Local government and weeds

Resilience – inside-out report 11

By Dr Su Wild River

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> "The Territory has small organizations, and institutions, and people move around in the same area. When I was a pastoral worker, they were giving out bags of gamba grass seeds, and at the same time you could go to the weeds branch and get help removing it. There was government funding in the same department, and two individuals in middle management had the power to push their own agendas and get two diametrically opposed positions." *Environmental manager in indigenous LG, Northern Territory* ."

Executive summary

Invasive plants are estimated to cost the Australian economy over $3 billion per year in lost agricultural production and controls. Environmental impacts are also significant (ARMCANZ at al 1997 in references). Australia's weed problem is growing, despite the many initiatives and institutional arrangements that have been established to tackle it. This report gives insights into the roles of practitioners in local government (LG) and regional natural resource management (NRM) agencies in relation to weeds, and their insights on weed issues.

Local and regional practitioners overwhelmingly consider current initiatives to be ineffective in controlling the spread and impact of weeds. There appear to be big differences between jurisdictions in the level of importance that is currently ascribed to weed problems, with practitioners in the Northern Territory notably more concerned abut weeds than those in Australian states. The following analytical categories are useful in explaining local and regional responses to weed problems:

- **knowledge** – and how it is gained and applied in tackling weeds;
- **formal roles** – and how they are failing to be ascribed for effective weed management;
- **initiatives** – those that are working or not working to strategically tackle weeds;
- **money** – especially the lack of available resources to tackle weeds of local significance;
- **work** – and the pressing need for on-ground action to prevent and remove weeds;
- **connections** – and the lack of connections between agencies involved in NRM; and the
- **commitment** – of agencies and individuals to tackling the spread of weeds.

An executive summary of all key findings from *Resilience* and detailed project methods are all available as separate, linked documents, along with the remaining 'inside-out reports'.

Background to the weeds report

Resilience is a Land & Water Australia project aiming to enhance rural local government (LG) capacity in natural resource management (NRM). Its focus is on enhancing the understanding that different spheres of government have of one another generally, and of NRM efforts in particular. *Resilience* is working with 28 local governments – four from each state. All participating LGs face serious, multiple NRM challenges, and have mixed levels of prior engagement in regional, state and national NRM initiatives.

The *Resilience* research involved 54 open-ended surveys with 79 practitioners working in local and regional agencies across rural Australia. Full transcriptions of responses to survey questions were analysed using N-Vivo qualitative data analysis software. This provided the capacity to search through all records for important concepts, even if these were not the explicit subject of survey questions. This was the approach taken in conducting the analysis for this report. None of the individual survey questions were explicitly about weeds. Yet weeds were mentioned during most interviews and in many cases, weed problems drew the most passionate and urgent comments from practitioners. It seemed worthwhile to pull together all of the comments about weeds, and make sense of how they fitted together to paint a national picture of weeds from local perspectives.

The number of times that an issue was mentioned is used as an estimate of its relative importance in this analysis. The comments made by individuals about weeds were considered in relation to:

- the effectiveness of controls, as described by interviewees;
- that state or territory in which the respondents worked; and
- concepts that help to explain responses to weeds and views on weed management.

Quantitative results

This section of the report briefly presents some quantitative results from this analysis.

Figure 1 shows practitioner views on the effectiveness of weed controls. This analytical category explains whether a control that was being applied actually works to reduce the spread and impact of weeds. Controls were more than three times as likely to be described as ineffective than effective. The effectiveness of controls was unclear in about one fifth of the statements made about weeds. The results here make a strong case that Australia is losing its battle against weeds, despite the concerted efforts currently being applied to this problem.

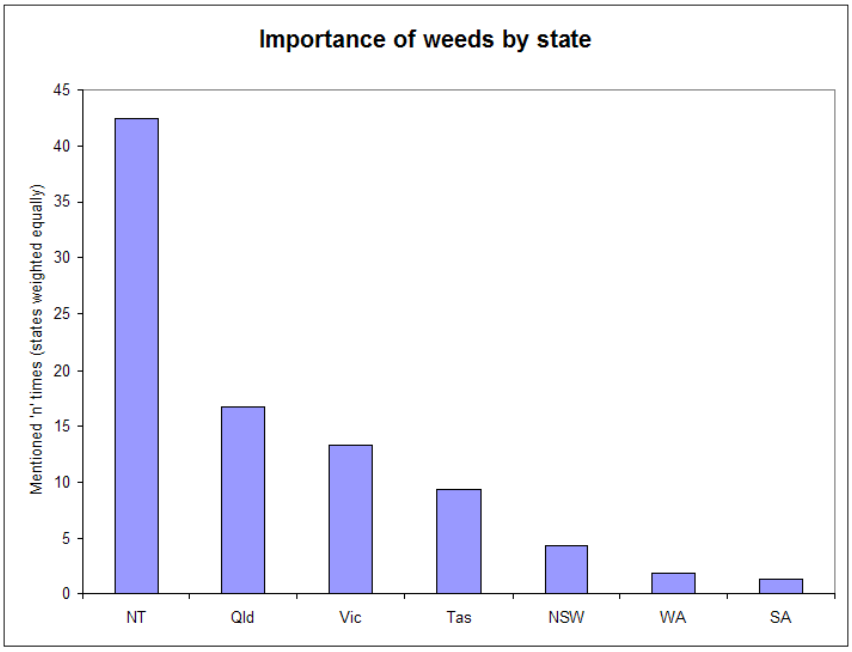

Figure 1 - effectiveness of weeds controls

Figure 2 shows the importance of weeds by jurisdiction. The results here were weighted as if the same number of people had been interviewed in each jurisdiction. Weed problems were mentioned nearly three times as often in the Northern Territory than in any other jurisdiction. Queensland and Victorian practitioners mentioned weeds next most often, and weeds were rarely mentioned in Western Australia and South Australia.

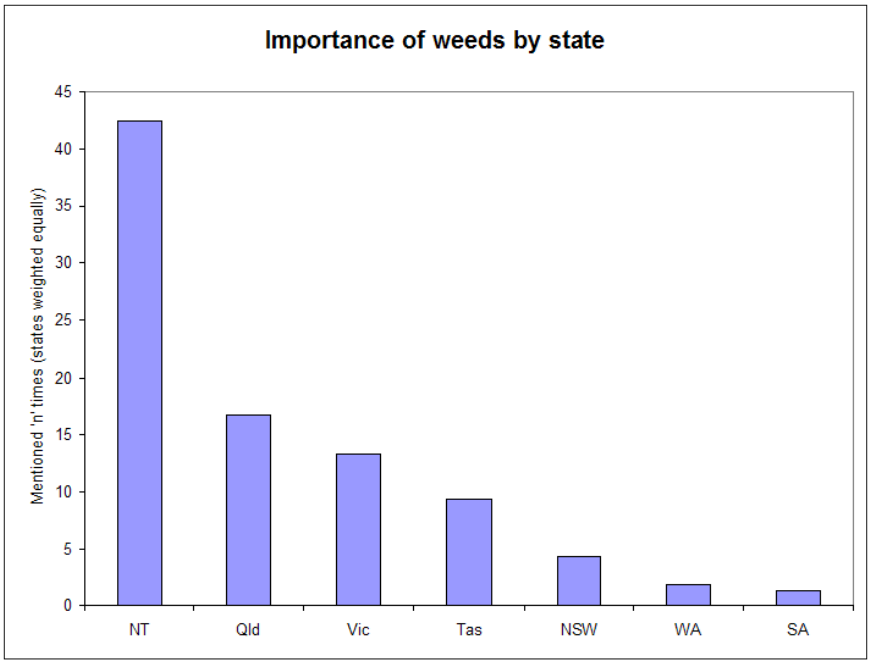

Figure 2 – Importance of weeds by state

Figure 3 shows some analytical categories, or concepts for weed controls. These are forces that are being applied by local and regional practitioners to tackle the spread of weeds, with varying levels of effectiveness. Each of these categories also appears in other *Resilience* inside-out reports. They are used consistently between reports, but have a different emphasis in each (see analytical categories). The graph also shows the number of times that each concept was raised in relation to weed issues. This gives an indication of the comparative importance of each control.

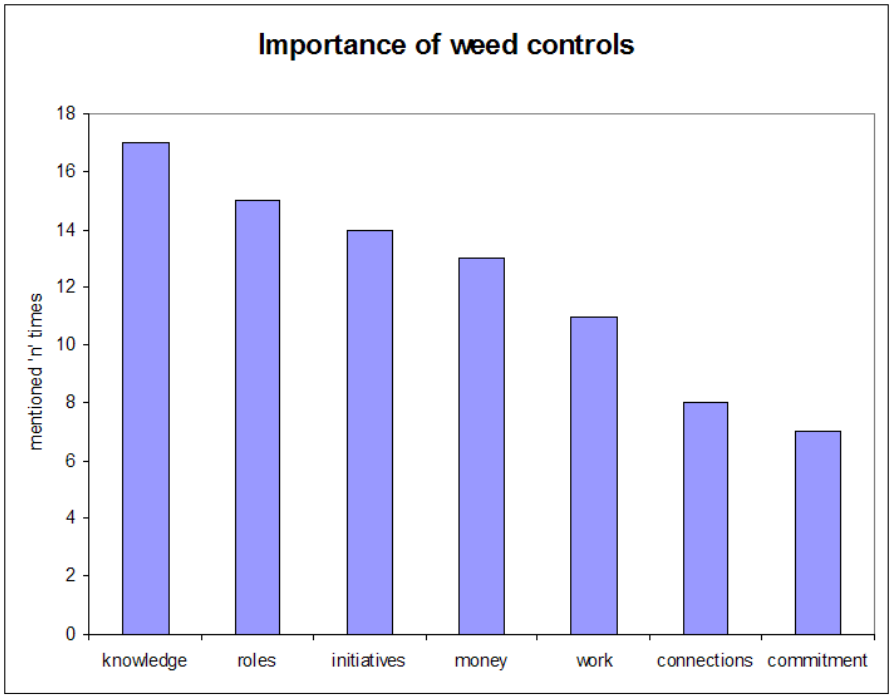

Figure 3 – Importance of weed controls

Figure 4 combines the information that was presented in Figures 1 and 3. It is a stacked bar chart showing the effectiveness of weed controls. There was considerable variation in effectiveness between controls. Knowledge, initiative and work controls appear to be the most effective. The least effective controls are money – generally because of the lack of money available for weed controls, and the ascription of roles for weed control.

Table 1 gives brief summaries of the quotes from practitioners that were coded into each combination of controls and effectiveness. In the electronic version of this report, the cells of this table are linked to the full set of direct quotes. This is so that readers can see for themselves what practitioners have said about controls and their effectiveness.

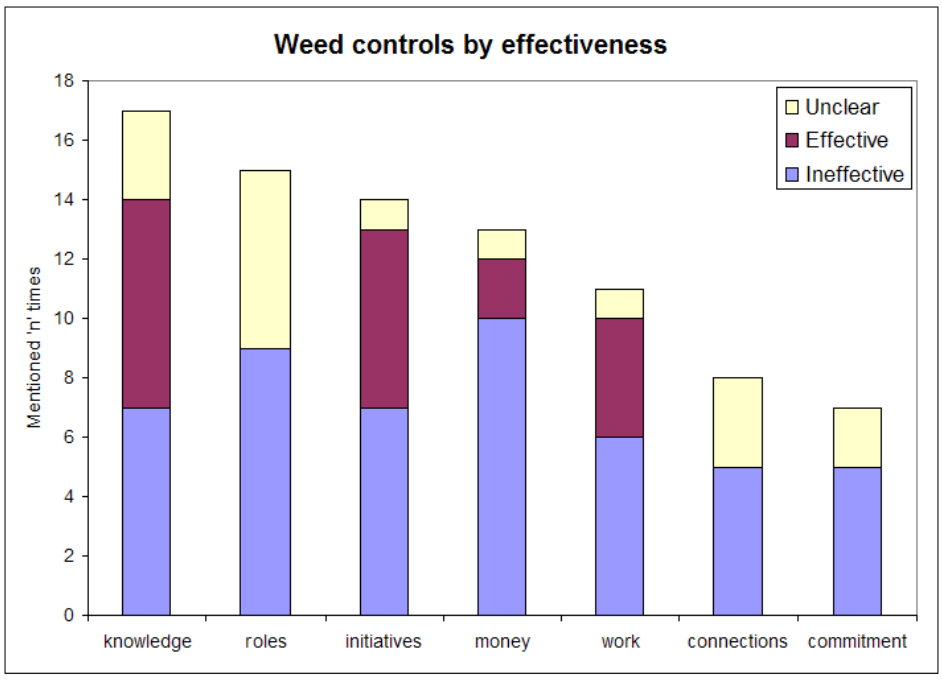

Figure 4 – weed controls by effectiveness

Table 1 – Defining weed controls by effectiveness

	Ineffective	Effective	Unclear
Knowledge	We don't know enough to prevent and eradicate weeds.	We know enough to prevent and eradicate weeds.	It is not clear whether we know enough to prevent and eradicate weeds.
Roles	Formal roles for weed prevention and management are not in place.	Formal roles for weed prevention and management are in place.	It is not clear whether formal roles for weed prevention and management are in place.
Initiatives	The first steps have not been taken to prevent and control weeds.	The first steps have been taken to prevent and control weeds.	It is not clear whether the first steps have been taken to prevent and control weeds.
Money	There is not enough cash to fund weed control.	There is enough cash available for weed control.	It is not clear whether there is enough cash for weed control.
Work	The practical, on-ground work of weed control is failing.	The practical, on-ground work of weed control is succeeding.	The outcomes of practical, on-ground work on weed control are unclear.
Connections	Agencies involved in weed control lack practical, coherent relationships.	Agencies involved in weed control exhibit practical, coherent relationships.	Relationships between agencies involved in weed control are unclear.
Commitment	People lack the will and commitment to control weeds.	People have the will and commitment to control weeds.	It is not clear whether people have the will and commitment to control weeds.

Knowledge

"Well when I came here two years ago I knew nothing about this region. The area that I am familiar with further south knew all about aquatic weeds and looked after them. But you see aerial photos of the wetlands and creeks, showing magnificent areas of native wildlife, and now they are totally choked. I mean totally clogged, because they have used all of the waterways as irrigation channels and have totally altered all of the aquatic environments." *Northern Queensland LG environmental manager*.

"We are purchasing differential GPS units and total stations (electronic theodilites)... There is no point getting a general area because you only need to leave one weed and you are in trouble. The fire and feral information can be broad scale, but the weeds and erosion control data needs to be exact. And these are linked to other GIS data based on drainage because seeds go downhill." *Indigenous LG environmental manager*

The analytical category of *knowledge* is defined as " an understanding of how to proceed towards NRM outcomes, comprising both actions and the context in which they are performed".

Knowledge seems to be one of the most effective weed controls currently being used in Australia. Among the interview data, there are as many stories of knowledge succeeding in eradicating, weeds as there are of failure. Some useful sources of knowledge for controlling weeds are:

- **weed maps** – especially if local versions are up-to-date, accurate to within metres and show other relevant features such as slopes and waterways;
- **the Weed Deck** – which are a set of plastic cards on priority weeds which can be easily taken into the field for references;
- **personal experience** - through living in a place for a long time and so understanding how seasons and other local features influence weed cycles;
- **weed management guides** – such as those for the weeds of national significance; and
- **aerial photographs** – that can be overlayed on planning schemes.

Countering these successes are many stories where a lack of knowledge is a barrier to weed control. They include instances when:

- it **fails to stimulate action**;
- **access to it is restricted**;
- it **doesn't connect** to other landscape features that influence weed-spread;
- it is **poorly focused**, and misses the weeds of local significance; and
- there is **not enough local knowledge** to inform sustainable solutions.

Figure 5 – Closer and closer to the beautiful hedge

Roles

"CEO – Weeds come through as an issue. LG hasn't been active in this because we have believed that it's a SG responsibility. SG has withdrawn a lot of their support for this, hoping that LGs will take over. But weeds go across boundaries so its not our role." *Tasmanian LG Group.*

Mayor – "weeds in water are a problem too. We are not clear on who is responsible for the waterways. Whether it's logs in rivers or weeds in rivers, it's still not clear. People just get shoved around." *Tasmanian LG Group.*

CEO – Statutory gaps with weeds are a problem. We would just end up having to fund it all." *Tasmanian LG Group.*

The analytical category of *roles* is defined as "the formal, statutory responsibility for undertaking specific NRM actions".

The lack of formal weed management roles for local, regional and state agencies is an important constraint. Roles are clear for the 20 Weeds of National Significance, and for the various weeds that are declared as important at state level. There are very significant financial constraints to any sphere of government declaring significant weeds as the statutory systems then require that work is undertaken to control them, and this is costly. No funds are made available to tackle locally-significant weeds unless those weeds also appear on lists of broader significance. LGs face increasingly severe resource constraints on all fronts, so they resist declaring weeds of local significance if possible (see the resources report). Thus there are no agencies responsible for controlling the great majority of weeds that are causing agricultural losses and habitat decline.

One of the problems in ascribing roles is that defining many plant species as weeds is politically fraught. The most common examples given in this data set are pasture plants which are sown as stock food, but have taken over neighbouring areas of native vegetation, and decorative garden plants. Buffalo grass in the central deserts, and gamba grass in the Top End have taken over massive areas of land in recent years. They are starting to invade other areas, such as the Kimberley. But because they are still planted as stock food, they are not listed as significant weeds and have few effective controls. Meanwhile, most of Australia's weeds originate as decorative species in private gardens – usually in urban areas. Their seeds tend to escape through waterways, including the stormwater drains that LGs are responsible for. There were reports among the stories told for *Resilience*, of grand old weed-tree species lovingly maintained in backyards on river banks, throwing millions of seeds into waterways each year. As with pasture grasses, it is hard to place restrictive controls on these much-loved weeds.

Weed roles are also hard to ascribe because weeds cross boundaries. Hence local actions need to be informed by their regional context, regions need to work together, and even state-level agencies need to work together to protect boundaries. Genuinely coordinated and cooperative intergovernmental arrangements are needed to achieve weed control. Most weeds travel downstream, and along road edges, so coordination through catchment management agencies is sensible.

In addition to roles not being ascribed for controlling specific weed species, there are landscape elements where formal management roles are lacking. Waterways are important examples. LGs are responsible for managing stormwater systems in urban areas, but outside of this the day-to-day management responsibility for many small waterways is not clear, and as a result no agency takes it on. Landcare groups have often found themselves to be the only group willing to control weeds on rural waterways. This volunteer labour is hard to sustain, especially if funds for essential equipment and information about how to control weeds is not readily available.

Initiatives

> "I have seen aggressive weed eradication programs work in other areas. It starts off with everyone hating it. You say "if you don't do it, we will come in and we will charge you for it". That starts off with causing a lot of problems, but after a few years they come on board. Here we have a problem where a lot of people are absentee landlords. They have bought their block hoping to make a capital gain or to retire here. And they don't do routine maintenance. It will hurt, but once you start you can clean up the weeds." *Northern Territory LG group.*

The analytical category of *initiatives* is defined as "programs, policies, or processes that take the first organised step in achieving an NRM outcome within a local area".

As with knowledge, initiatives are a powerful force currently being applied to control weeds in Australia. Some initiatives that were described as effective include:

- **listing** of significant weeds;
- **published advice** about plants that should not be transported;
- supply of **low-cost herbicides**;
- implementation of aggressive **weed eradication programs**; and
- **consultation** on weed plans.

Ineffective weed initiatives are also commonly reported. These stem from both an absence of any effective initiatives, inadequate initiatives and poor implementation of initiatives. Specific examples include:

- **inappropriate devolution** of responsibilities to LGs;
- **biological controls** that aren't working;
- **fear of litigation** that constrains agencies from giving advice;
- **no grants** or other funds available to implement initiatives; and
- **historical legacies** of past initiatives that have led to infestation by problem weeds.

Money

> "We are an extensive shire, with all of the weeds that anyone has, and nothing to do anything about them. We may be the right people to deal with them, but we don't have the funds to do it, so we ignore it. We play the game and have our management plans but they are useless without any funding." North Queensland LG Chief Executive Officer

The analytical category of *money* is defined as "the cash available to invest in achieving NRM outcomes, which may be flexible, tied to specific initiatives, raised through rates or received through grants".

Many respondents cited the lack of money as contributing to ineffective weed control. This is true for all spheres of government. It is particularly important for LG since they are the poorest sphere of government with ever-increasing unfunded mandates (see resources report). LGs are also present across nearly all of Australia, and are the on-ground agency with the machinery, the people and the grounded knowledge to give them the potential capacity to control weeds – if only they were funded for it.

Weeds are estimated to directly cost Australia $3billion per year, and this amount is increasing (ARMCANZ at al 1997 in references). Funds of this scale are probably justified to control weeds and could greatly assist the effectiveness of each other control being used to tackle the spread of weeds.

Work

> "The pastoralists are only treating the weeds on their properties where the maximum benefit can be received for the least work. The environmental strategies for dealing with Parkinsonia are clear. You start upstream and move down. You don't spend a cent at the mouth of the river until you have treated it at the source. But because it will take so long in this this case, the political pressure suggests doing something down the bottom." *Indigenous LG environmental manager*

The analytical category of *work* is defined as "the practical, on-ground work that has a definite impact on NRM problems".

Work is another weed control which is often effectively applied. In fact work is the essential control since without on-ground weed eradication work, all knowledge, initiatives and other controls are useless. And anyone who has done weed control work will know that it is hard and uncompromising because of the very nature of weeds. Weeds are usually spiky or otherwise unpleasant to be near. They are hard to dislodge, re-infest from the smallest remnant and they often need to be taken out in difficult environmental conditions, such as in extreme heat or cold and wet settings. Chemical weed control is often the only realistic option, but some committed environmentalists – such as many Landcare volunteers – resist this approach. With many weed species, fire is an appealing immediate solution, requiring little work. But it stimulates reproduction or growth of some weeds and so can quickly exacerbate the problem.

Without long-term management, even weeds that are successfully removed from an area, tend to be replaced by other weed species. Weed control work seems even harder and less appealing to workers when weeds re-infest from other areas, and the hard work is undone within years. So gaps in ascribing roles, allocating enough money and failure to apply good knowledge multiply the constraints to work.

Weed control work itself is ineffective when it is:

- **poorly targeted** – as in the quote above where weeds are removed downstream only to reinfest from upstream each year;
- applied in **one location** (for instance a LG nature reserve) **but not another** area (waterways, private land or road edges);
- needed on land with **absentee landlords**; or
- applied **too late**.

Some examples of effective forces that work against weeds in Australia are the:

- **Landcare** groups;
- **Greencorp**;
- participants in **Community Development Employment Programs**; and
- **other conservation volunteers**.

Connections

> "Should LGs do weeds? It needs to be done in partnership in a unified approach. There is no point us going and managing our land, when our neighbours don't. It has to be a unified, collaborative approach to the whole thing." *Northern Territory LG group.*

The analytical category of *connections* is defined as "having practical and coherent relationships between NRM agencies".

No examples of effective connections for weed control were given during *Resilience* interviews. Most of the shortfalls in connections for weed control have already been mentioned in this report. Weeds cross boundaries therefore different agencies and individuals are responsible (or not) for controlling a spreading outbreak. Unless they all work together, weeds will reinfest even if they are removed. At present, Australia's various agencies and individuals are much too disconnected to effectively control weeds.

There was a promising example given of connections that are being established, and might yet deliver effective weed control. It is described in the following quote.

> "We had a big facilitated session during a LG forum hosted by the regional NRM agency. We had the LG representatives talking about what they thought of NRM, the changes in the last 5 years, and the attitude change that is occurring. They realized that NRM is part of core business, and not something scary that they can hide from. We identified and agreed to 6 NRM issues of regional importance. They were: weeds; stock routes and reserves; water; waste; land management; water use efficiency.
>
> "Then at our last steering committee meeting we tried to work out which are the important weeds for us to target and why. Then we tried to put the issues from each council into a regional picture so that

we could work out movements of weeds between shires. This is a big issue that everyone is grappling with. The regional coordinator for weeds in the regional agency came along to the meeting" *Southern Queensland Regional NRM Agency LG Facilitator.*

Commitment

"And once you get out of the areas where land is being used to make money, then people don't have the capability to do the survey work, or to effectively manage weeds - even if they wanted to. Or they have a different view on what is a weed" *Northern Territory Government Regional Manager.*

The analytical category of *commitment* is defined as "the political and personal will and intention to achieve NRM outcomes, including the support of council the community and/or a relevant plan or policy".

As with connections, many issues constraining commitment have already been described in this report. People disagree about what species are weeds. The weeds that are locally significant don't appear on national or state-level weeds lists so their control is therefore not formally required. Not all neighbours control their weeds so re-infestation occurs. All of these factors reduce people's confidence that their weed control work will be worthwhile, and their commitment fades.

Chapter 12: Coordination between spheres

Resilience – inside-out report 12

By Dr Su Wild River,

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> "People need to know more about their positions and strategies in order to deliver good environmental outcomes together. We are about to do a weed strategy and it would be good to build on the work that has already been done, so that we can add to it in ways that will encourage and assist all agencies to improve their effectiveness. "
> *Western Victorian LG Group*

Executive summary

Rural LGs face many constraints, and some drivers to effective coordination for NRM outcomes. Coordination may be achieved when there are:

- **clear responsibilities –** due to no gaps or overlaps in NRM roles, which are also well understood by all;
- **connections** – made through effective institutional framework, and individual efforts; and
- **commitment –** based on a long time living locally and the cooperative efforts of individuals.

Background and context

Resilience is a Land and Water Australia project aiming to enhance local government capacity in Natural Resource Management (NRM). Its focus is on improving the understanding that different spheres of government have of one another generally, and of NRM efforts in particular. Resilience is working with 28 local governments – four from each state – and the regional organisations they work with on NRM issues. All participating LGs face serious, multiple NRM challenges. They have mixed levels of prior engagement in regional, state and national NRM initiatives. A short brochure gives further background to the overall project.

The inside-out reports present results from 52 in-depth interviews conducted during 2004 and 2005 with 79 officials from participating LGs and the agencies that they work with on NRM issues. The primary purpose of these reports is to provide insights to state and national agencies about local perspectives NRM issues and initiatives.

Grounded theory and action research methods provide the analytical framework for the inside-out reports. In brief, the core methodological goals are to:

- induce analytical categories that explain local experiences of NRM,
- define those categories, and
- describe the relationships between them.

Analytical categories are the basic building blocks of scientific theories. They are simple concepts that go together to make coherent theories about phenomena. Good analytical categories are complete, mutually exclusive and meaningful. At times, broad categories are broken down into subcategories that add more detail to the concepts. The analytical categories reported here aim to fit all of the data and work in explaining NRM in action (see Kincaid 1996; Strauss and Corbin 1990 – in references). They are shown in italics throughout this report, and presented as part of the full set of Resilience analytical categories in a separate document. Details on the use of qualitative induction and grounded theory methods within Resilience are in the Resilience Methodology Report.

Background to the coordination report

Coordination was one of 5 NRM issues explored through gap analysis. That is a survey technique exploring the gap between the importance and effectiveness of an initiative. A high level of importance and a big gap indicates a serious problem. The coordination questions were:

- How important is a clear responsibility for all NRM issues, so that all players know exactly who is responsible for what? And
- How effective has that coordination been in the past?

A scale of 1-5 was used for rating both importance and effectiveness in the gap analysis questions. The scale is shown below.

Table 1 – Scale used in gap analysis

Importance	Completely unimportant	Unimportant	Neither	Important	Critically important
Score	1	2	3	4	5
Effectiveness	Totally ineffective	Ineffective	Neither	Effective	Completely effective

Coordination compared with other gap analysis results

Figures 1, 2 and 3 give an overview of the results for coordination compared with other issues addressed in the gap analysis. Figure 1 shows the relative importance and effectiveness of each of the five generic NRM issues tackled by gap analysis. Figure 2 shows results for coordination alone, for different levels of engagement. Figure 3 summarises responses to coordination for agencies within and outside the Murray Darling Basin.

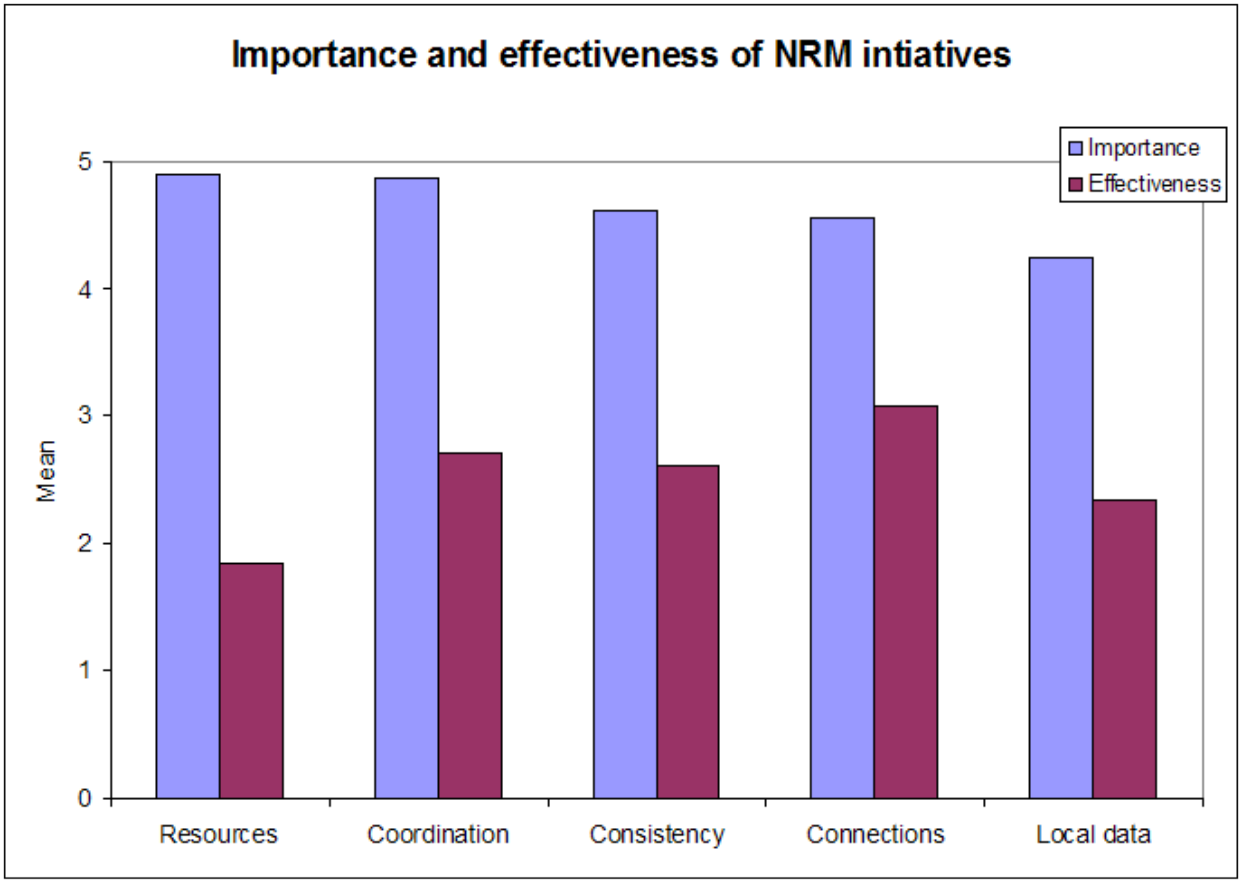

Figure 1 - Importance and effectiveness of NRM initiatives

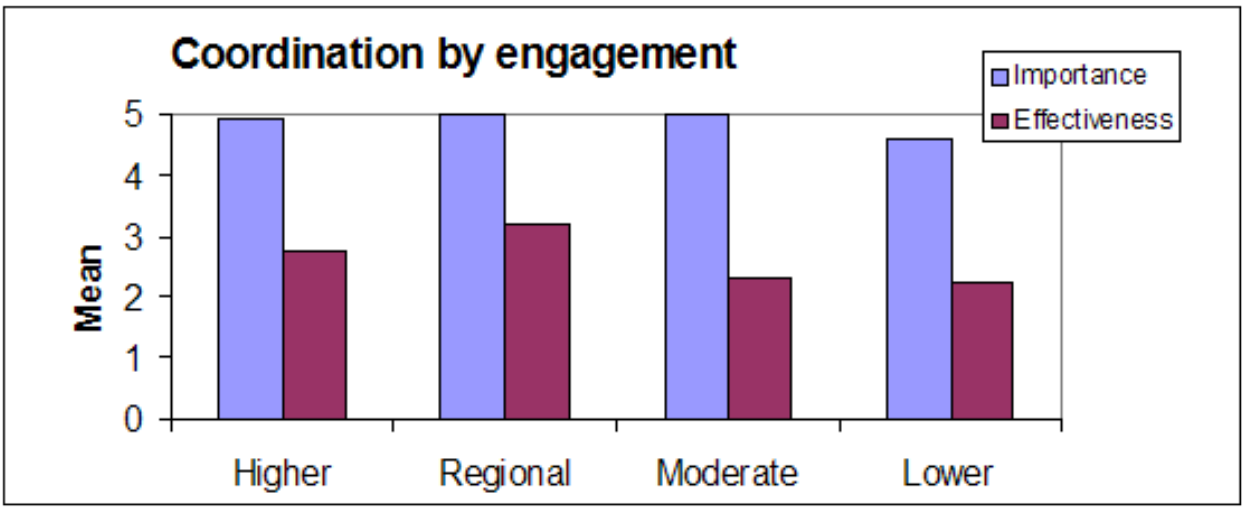

Figure 2 - Coordination by engagement

Figure 1 shows that interviewees considered resources, coordination and consistency to be of fairly similar importance. But of the three, coordination was considered the most effective. Figure 2 suggests that LGs with higher levels of engagement with NRM programs, and regional NRM agencies saw fewer problems with coordination compared with less engaged LGs. Figure 3 suggests that agencies within the Murray Darling Basin are more satisfied with coordination than those outside. This could be because the current regional NRM agencies have a longer history within the MDB compared with other places, and so may have established better ways to ensure coordination between spheres of government for NRM outcomes. These issues are explored further in the following discussion.

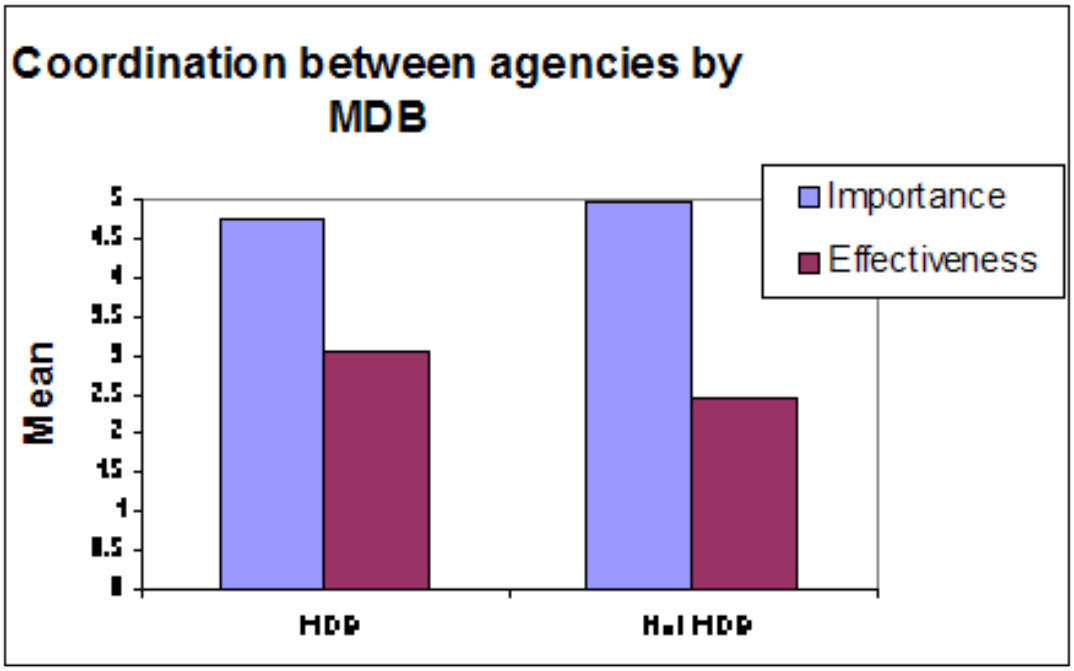

Figure 3 - Coordination by MDB

One of the early questions explored during analysis was whether a relationship existed between a person's understanding of coordination, and their view on its importance and effectiveness. The analysis was achieved by gathering all responses from people who recorded a large gap (two or more) between the importance and effectiveness of coordination, and comparing their comments with those of people recording a small gap (one or less). (The results of this search are available through the links provided here.)

Surprisingly, there was no evidence of a relationship between understanding of and degree of concern about coordination. People identified similar types of concerns about coordination, whether or not they perceived a lack of coordination to be a major NRM problem. As a result, the remaining analysis focused on understanding the types of concerns that people had about coordination.

Integrated results

Figure 4 shows the results of qualitative analysis on the range of issues raised in relation to coordination between spheres of government. There are two dimensions to this graph. One is the drivers and constraints by sphere interactions, which is shown in the stacks within each bar. These drivers and constraints are discussed in the next section, and also within the LG analytical themes report. The second dimension is specific to coordination issues. These are analytical categories that explain the drivers and constraints to coordination.

Coordination can be understood in relation to the three broad analytical categories of:

- **clear responsibilities –** due to no gaps or overlaps in NRM roles, which are also well understood by all;
- **connections** – made through effective institutional framework, and individual efforts; and

- **commitment –** based on a long time living locally and the cooperative efforts of individuals.

Note that the third category of commitment is consistent with the same category reported in resources needed to fulfill local NRM roles. However for further clarity, in this analysis it has been broken down further into the two subcategories mentioned above.

Each of these three broad analytical categories are discussed below in this report, along with the subcategories that contribute to them. The earlier sections deal with issues that were mentioned most often, while later sections report on those that were mentioned less. Table 2 – below the graph – gives a definition of the cross-cutting issues by summarising the common features of each quote counted with that section of the chart. The cells of the table also give links to the full set of quotes, so that readers can see what practitioners have said in relation to each of these issues.

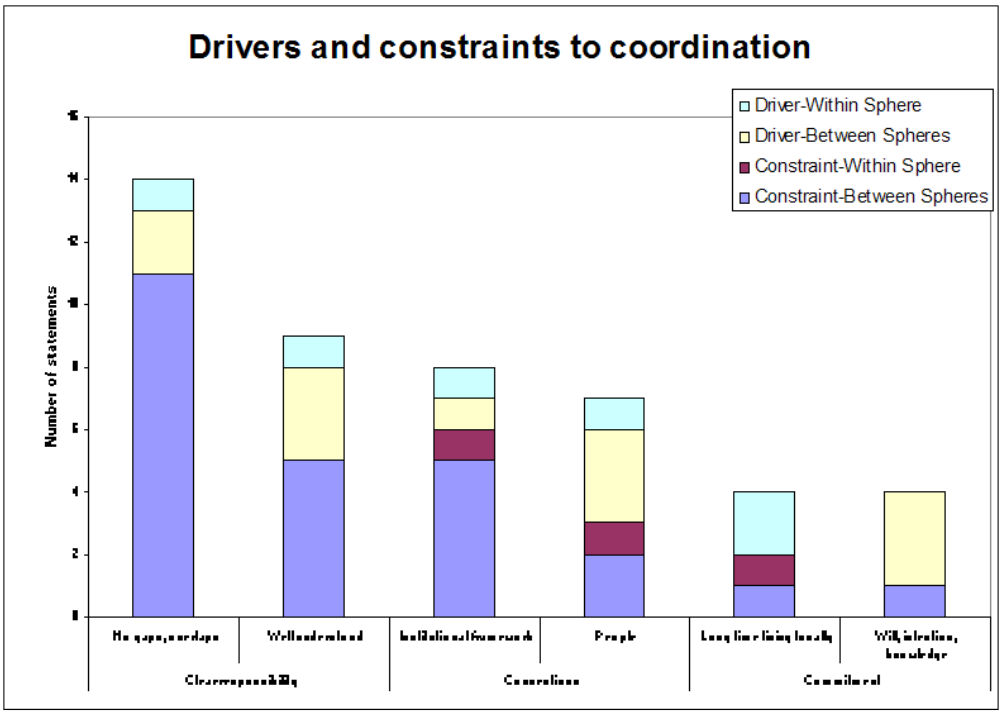

Table 2 Drivers and constraints of coordination

	Clear responsibilities		Connections		Commitment	
	No gaps, overlaps	**Well understood**	**Institutional framework**	**People**	**Long time living locally**	**Cooperative efforts**
Constraint-between spheres	Gaps and duplication of roles between agencies	Too many agencies, too much chaos	Information passes from LG to other spheres, but not back	Hard to meet all expectations on short contracts	Short contracts drive away good staff	Not all officials work with those from other spheres
Driver-between spheres	Lead agency specified for	All know what each sphere is	Catchment management plan might help	People with many roles connect spheres	Long-term staff can lobby to	LG officials work with those from other spheres

	each NRM role	responsible for			retain others	
Constraint-within sphere	Gaps or duplicate roles within agency	Roles not well known within sphere	Some council structures hinder coordination	You have to be on the ball to keep it working	Can't get good staff to stay in remote area.	Not all officials work with locals and one another
Driver-within sphere	Lead department specified for each NRM role	All know their roles within a sphere	Some council structures help coordination	People within council help coordinate	Being in LG means getting involved.	LG officials work with locals and one another

Drivers and constraints by sphere interactions

Each of the first four inside-out reports focuses on a generic NRM issue that was addressed through the gap analysis survey. The reports cover resources for NRM roles, consistency between local and broader plans, local contributions to regional and national databases, and this one on coordination between spheres. In each case, the major themes of *drivers* and *constraints within* and *between* spheres of government was a meaningful and rich focus for analysis. The LG analytical themes report includes a detailed discussion of these analytical categories, including their research origins, and overall patterns across each of these first four inside-out reports. Refer to that report for a discussion on these major themes. Meanwhile, Table 3 below defines, and shows the relationship between the four categories to help clarify their use in this report.

In relation to coordination, it is worth noting that, as with other generic NRM issues:

- constraints occurring between spheres were most commonly reported, and made up half of all statements,
- next common were drivers between spheres, followed by constraints within and finally drivers within spheres, and
- the per cent of statements within each category was very similar between the four NRM issues.

Table 3 - Defining drivers and constraints by sphere interactions

	Between	***Within***
Constraint	**Constraint between** – a force stopping or hindering, and originating or impacting across spheres of government.	**Constraint within -** a force stopping or hindering, whose origin and impact are restricted to one sphere of government.
Driver	**Driver between** – a force causing or helping NRM, and originating or	**Driver within -** a force causing or helping NRM, whose origin and impact are restricted to one sphere of government.

	Between	***Within***
	impacting across spheres of government.	

Clear responsibilities

Clear responsibility is a broad analytical category. It is defined as transparent, unambiguous authority in relation to NRM actions. The achievement of clear responsibilities appeared to be the most important aspect of effective coordination, since it was most commonly mentioned within interviews. Most of the times that clear responsibilities were mentioned these related to constraints between spheres, but there were also many drivers both between and within spheres.

Practitioners articulated two sub-categories of clear responsibilities. Clear responsibility is achieved by having *no gaps or overlaps* between the authority of different agencies, and *well understood* responsibilities both within and outside the authorised agencies. These subcategories are now discussed.

No gaps or overlaps

> "Clear responsibility very very important. You can't operate if you don't know who is responsible because there will be gaps and double-ups. LG has a very confusing role there, because it has some responsibilities through recent regulations that name them as the responsible agencies, but they don't really understand all of the new responsibilities. Departments don't really approach local governments to explain their responsibilities. The Integrated Planning Act and the Environmental Protection Act are examples. It is hard for LGs even understanding their own requirements, let alone their regulatory roles in implementing it." *South East Queensland Regional NRM Agency coordinator*

The definition for the analytical category of *no gaps, overlaps* is "a lead agency is specified for each NRM role, and there are no significant roles missing or double-ups in agency responsibilities".

Respondents identified many inherent difficulties in avoiding gaps and overlaps in NRM responsibilities. Most NRM issues are linked, and it is hard to separate responsibilities at an institutional level. An example of a gap in responsibilities is in the management of highway weeds, as noted in the following quote.

> "There is too much buck passing, and the government opts out. Highway weeds are an example. It is easier for the state government to ignore than it is for local government. There is no statutory requirement for either sphere to do it, but local government fixes it because it is a local priority." *Southern New South Wales LG group.*

Some practitioners believe that coordination problems have been solved elsewhere in Australia – for example through Integrated Catchment Management in the Murray Darling Basin, as in the next quote. Although practitioners within that basin do not appear to agree (given the Gap Analysis

results shown in Figure 3) the ideas stated here for reducing gaps and overlaps are worth noting as providing some possible solutions to this problem. Certainly, when staff are shared between LG and Catchment Management Authorities, they frequently report good coordination.

> "In this town we would like to see a similar approach to down south with Catchment Management Authorities where the resources are pooled, and the NRM, catchment management staff are pooled, so that we don't have distinctions, and there is a central library, and having buckets of money for the region so that we can do training or go to conferences that individual budgets can't handle." *Northern Territory LG Group*.

Well understood

> "Councillors tend to get on these committees and have no staff backup. Quite often a councillor will go to a meeting, and have absolutely no idea what is going on, so they will make a decision that makes absolutely no sense. Its very frustrating. And sometimes it is a one-way street so we give them the information but don't get it back from them." *Southern Queensland LG Manager.*

The analytical category of *well understood* responsibilities is when "agencies and individuals perceive the significance and nature of responsibilities, and know how to deal with one another as a result".

When responsibilities are well understood, coordination can be achieved through timely information sharing and action that are consistent with the various responsibilities held by each agency. When

responsibilities are poorly understood effective NRM outcomes will not be achieved because each agency is operating without knowledge of what the other is doing.

It may not be practically difficult to improve understandings of the responsibilities being filled by different agencies and to use this knowledge to improve operations. However it probably does require a willingness to cooperate and some trust between individuals. Having those individuals stay working in their roles for some time probably also helps.

> "That's fairly important. Like in planning issues that I look at every week. Only this morning I was talking with the energy people, and they wanted to find some way that we could improve the system of sharing information. I have always passed applications directly to the energy people if an application requires that power lines go across roads. This same system is now being set up between us and other agencies." *Southern Queensland LG Manager.*

Connections

The broad analytical category of *connections* is about "having practical and coherent relationships between NRM agencies". This is achieved through either of two approaches – suitable *institutional frameworks* and/or *people*. These two subcategories are now discussed.

Institutional framework

> "We are in an interim phase in the NT at the moment. We haven't got our plan yet, so we are operating on 80% of our original budget. So rather than having a separate weeds, fire etc committee we would like to have one central committee. There are not many people here and people feel over-consulted with all of the different plans. It would be easier to pull it all together." *Northern Territory LG Group*

The *institutional frameworks* of interest here are "organisations, customs or practices that that support coordination of NRM efforts".

When LG practitioners discussed institutional frameworks it was generally that the arrangements between spheres were inadequate for achieving coordination towards NRM outcomes. Issues included lack of formal interactions between agencies, poor, no or too much consultation, not being included on the right committees, and agencies not helping one another by sharing knowledge and other resources.

Some regional agency officials felt that LGs simply didn't have the institutional capacity to achieve large-scale coordination efforts required for large initiatives, as in the following quote.

> "Regarding the large regional project being led by a nearby LG. I think the problem is similar for many other small LGs. Small LGs don't have the resources to manage big projects like that. I think they feel that they do, and they want to have a major say in what happens. So to try to do that they feel like they want to be in control. But unfortunately they don't manage it. That's not just money, but personnel, and having the number of people. There are over 300 people in my Department alone whose skills we can draw on for this. If there was someone in another part of the state with the knowledge that was needed up here, I could go and get it, or could bring the person up here. The LGs don't have those resources." *Western Australian Manager state government regional office*.

There were two mentions of institutional arrangements as drivers to coordination for NRM outcomes. The driver within a sphere was a good council structure that supported interactions. This would still rely on knowledgeable and 'on-the-ball' individuals to affect coordination. The driver between spheres was a regional catchment investment plan. Neither of these were particularly well-established or robust institutional arrangements.

People

> "The other problem with this is that it depends on the council structure, and quite often it is different officers doing different jobs, and with all of the cross-overs unless you are really on-the-ball and talking with the other officers and managers you might not pass the information through just like anywhere else." *Southern Queensland Environmental Manager*

The analytical category of *people* is defined as " knowledgeable, skilled, committed people with regular, up-to-date connections with environmental issues and broader communities of experts. They may be LG councillors, officers, managers, community members and may work on either a local or regional basis, servicing several LGs". This is consistent with *people* as a resource (see Resources report).

To achieve coordination, people must be prepared to work together, and be 'on the ball'. They need to keep all relevant issues in mind and actively make connections themselves, and highlighting them to others.

Commitment

The broad category of commitment is defined as "the political and personal will and intention to achieve NRM outcomes, including the support of council the community and/or a relevant plan or policy". This analytical category is also useful in understanding resource drivers and constraints and engagement in NRM programs. In relation to coordination, there are two clear subcategories – a long time living locally, and cooperative effort.

Long time living locally

> "This has shifted from very effective about 10 years ago, to completely ineffective now. It is very important, and very hard to track down. It was really good when these people lived locally, and had a great commitment to the local area, as well as developing good knowledge about local issues. If people live locally they really do have a greater commitment to the local area." *Southern New South Wales LG Group*

The analytical category of *long time living locally* is defined as " individuals involved in NRM programs have lived in the local area, and been actively involved in achieving cooperative NRM outcomes for many years".

Living for a long time in a local area allows practitioners to acquire many personal attributes that are otherwise elusive. This applies whether the individual is a farmer, other landholder, scientist or other professional in the field. They come to understand local issues, to know the local operators, and often to develop a strong attachment to the local area, consistent with a commitment to retaining and protecting local NRM values. Some of the features of current NRM frameworks work

against coordination through a long time living locally. The short-term contracts currently available for NRM officials, and reduction in positions for extension officers are examples.

Cooperative efforts

> "If roles are properly defined you don't need a single office. Its better to put the effort into defining the roles really well so that everyone understands where they fit in with the others. We need good individuals in the positions, but they are not useful if they just push their own barrows. They need to know what they are doing, and who to go to for other roles. We need clear direction, regional expertise and a willingness to work together." Southern New South Wales LG Group.

The analytical category of *cooperative efforts* is defined as a " helpful willingness in working together to achieve NRM outcomes".

Cooperative effort requires practitioners to give and take, at times helping one another beyond the strict scope of a duty statement, and other times accepting help from others. For this to work, all of those involved need to be sure that they are working together on shared goals that are larger than any individual work plan. Cooperative efforts are enhanced by good past experiences, well-accepted NRM plans and a network of trusted and committed operators. Cooperative efforts work in a context of *no gaps or overlaps* (as in the first analytical category discussed in this report) in that agencies and individuals help out even when a role is clearly the primary responsibility of an associate, and can also help to fill gaps, or address overlaps when people work together regardless of arrangements that suggest that such efforts are not required.

Cooperative efforts may be undermined by overly specific individual work plans, and inflexibility within organisations goals that restrict practitioners from helping out with work that is not formally recognised as their core business.

Chapter 13: Consistency between local and broader plans

Resilience – inside-out report 13

> "From a planning point of view these different agencies think they are doing planning, but the councils really can't see how it all fits together. They get this information from whichever agency - the Premier's Department, or the CMA or whatever, and they really can't see how it all links together. There are layers and layers and layers of NRM things that they can get involved in. And I don't think that anyone is really overseeing the whole picture to ensure that it all fits together properly." *Southern Queensland Regional NRM Facilitator*

Executive summary

Plans, policies and strategies for achieving sustainable natural resource management (NRM) exist, and are being written at all scales across Australia. Local governments (LGs) in most jurisdictions have statutory requirements for developing land use Planning Schemes, as well as corporate plans and a range of other strategic planning documents. The Regional NRM agencies are involved in current processes to develop regional plans that will inform future NRM funding arrangements. Other agencies too, are involved in strategic planning exercises that inform their own NRM actions. This report investigates LG views on the importance and effectiveness of efforts to ensure consistency between the various NRM plans.

The report focuses on three dimensions of consistency between local and broader plans. First, it considers the drivers and constraints to consistent plans with regard to interactions between spheres of government. Results show that there is little consistency being achieved, and that there are currently many more constraints to consistency than there are drivers. The second dimension explains the nature of the drivers and constraints. Three main concepts explain the drivers and constraints to consistency – environmental features, institutional frameworks and resources. The third dimension to the analysis reflects different views on consistency due to a practitioner's location either within or outside of the Murray Darling Basin (MDB). Strategic environmental issues dominated discussion within the MDB, while obvious features were more commonly mentioned outside. Constraints due to a lack of institutional support for consistent planning were a dominant theme in interviews conducted within the MDB.

An executive summary of all key findings from *Resilience* and detailed project methods are all available as separate, linked documents, along with the remaining 'inside-out reports'.

Background to the consistency report

Consistency was one of 5 NRM issues explored through gap analysis. Gap analysis is a survey technique exploring the gap between the importance and effectiveness of an initiative. A high level of importance coupled with a big gap indicates a serious problem. The coordination questions were:

- How important is it that local government plans are consistent with regional and state plans, such as Catchment Management Plans? And
- How effective are current processes for ensuring this consistency?

A scale of 1-5 was used for rating both importance and effectiveness in the gap analysis questions. The scale is shown below.

Table 1 – scale used in gap analysis

Importance	Completely unimportant	Unimportant	Neither	Important	Critically important
Score	1	2	3	4	5
Effectiveness	Totally ineffective	Ineffective	Neither	Effective	Completely effective

Consistency compared with other gap analysis results

Figures 1, 2 and 3 give an overview of the results for consistency compared with other issues addressed in the gap analysis. Figure 1 shows the relative importance and effectiveness of each of the five generic NRM issues tackled by gap analysis. Figure 2 shows results for resources alone, for different levels of engagement. Figure 3 summarises responses to resources for agencies within and outside the Murray Darling Basin.

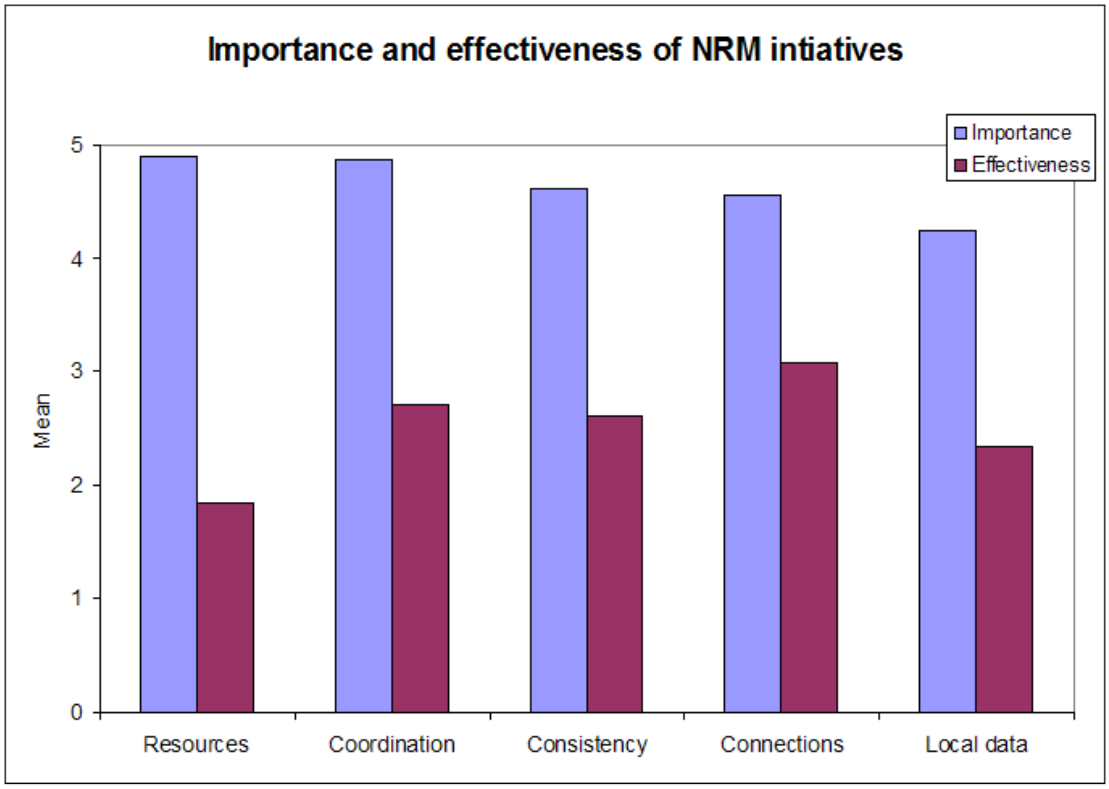

Figure 1 - Importance and effectiveness of NRM initiatives

Figure 1 shows that consistency between plans was of almost equal importance to resources and coordination, and was nearly as effective as coordination. Most respondents considered consistency between plans to be little better than ineffective.

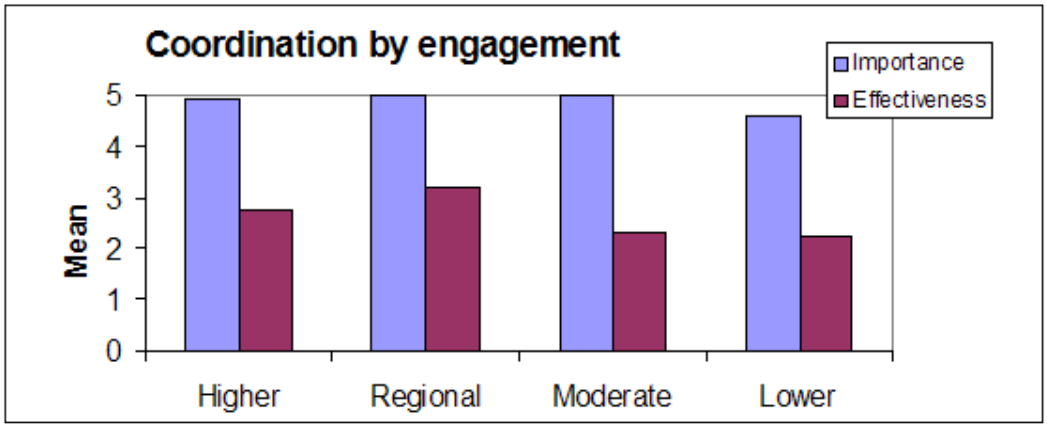

Figure 2 - Consistency between plans by engagement

Figure 2 suggests that there might be differences in opinion about consistency between plans depending on a respondent's level of engagement in NRM programs. The least engaged LGs perceived the greatest problems.

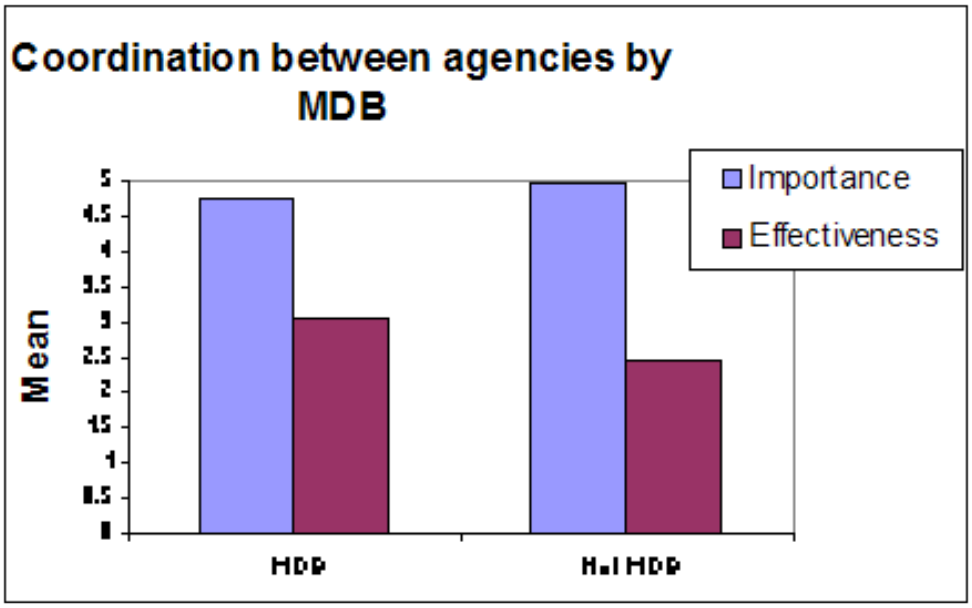

Figure 3 - Consistency between plans by Murray Darling Basin

Figure 3 suggests that there might be some differences in perceptions of consistency problem between agencies within and outside of the Murray Darling Basin. Agencies within the Murray Darling Basin perceive fewer problems than those outside the basin. These insights are explored further below, in the section on integrated results and the Murray Darling Basin.

Drivers and constraints of consistency between plans

Figure 4 summarises the result of qualitative analysis on the range of issues raised in relation to the consistency between NRM plans developed by different agencies. There are two dimensions to this graph. One is the drivers and constraints by sphere interactions, which is shown in the stacks within each bar. These drivers and constraints are discussed in the following sections in relation to consistency between plans, and in detail in the report on LG analytical themes. Table 2 also defines these analytical categories.

Table 2 – Defining drivers and constraints by sphere interactions

	Between	Within
Constraint	**Constraint between** – a force stopping or hindering, and originating or impacting across spheres of government.	**Constraint within –** a force stopping or hindering, whose origin and impact are restricted to one sphere of government.
Driver	**Driver between** – a force causing or helping NRM, and originating or impacting across spheres of government.	**Driver within –** a force causing or helping NRM, whose origin and impact are restricted to one sphere of government.

It is worth noting the following general findings about drivers and constraints by sphere interactions:

- constraints occurring between spheres were most commonly reported, and comprised about half of all statements;
- next most common were drivers between spheres, followed by constraints within and finally drivers within spheres; and
- the proportion of statements within each category was very similar between the four NRM issues.

The second dimension to the analysis of consistency between NRM plans is specific to this report. This dimension explains the drivers and constraints to consistency between NRM plans, in relation to:

- **environmental features** – strategic and obvious;
- **institutional frameworks** – supporting or requiring consistency; and
- **resources** – timing and knowledge.

Note that although this set of analytical categories is unique to consistency, some individual categories are also found in the resource and coordination reports. The definitions and application of these concepts is consistent between reports. Also note that plans, strategies and policies are an analytical category that helps to explain how people learn about NRM problems. This whole report is dedicated to the types of plans, strategies and policies that are discussed briefly in that report.

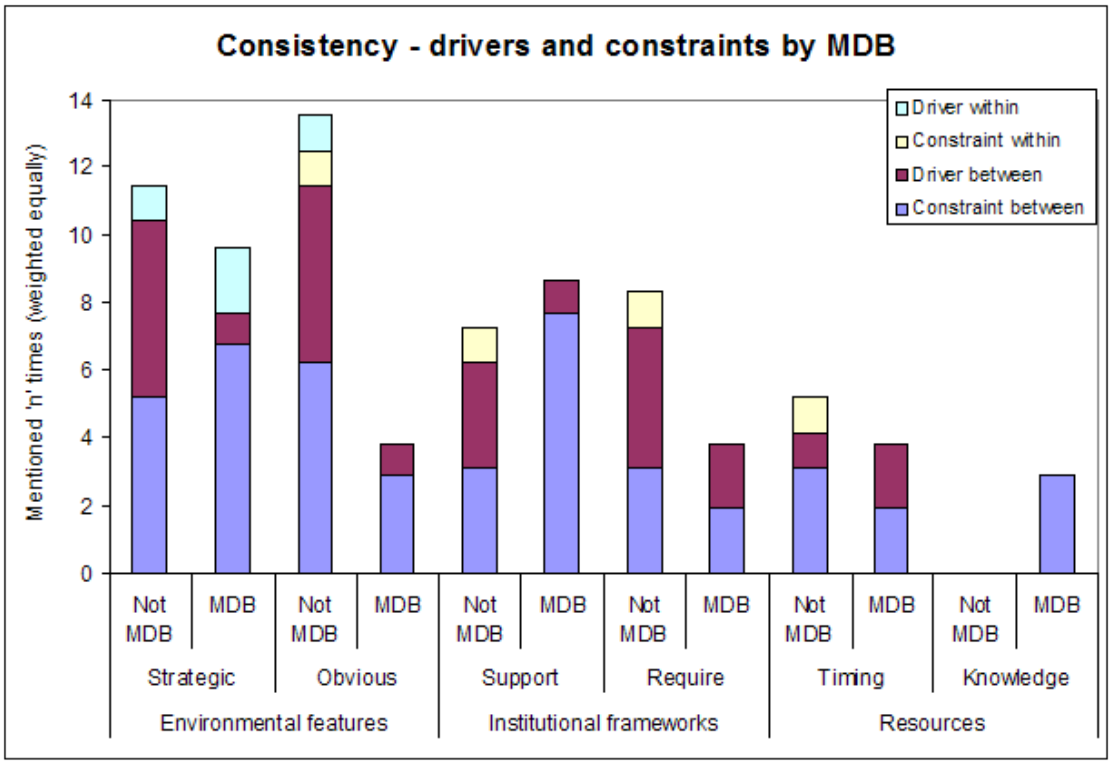

Figure 4 – Consistency – drivers and constraints by MDB

The results of the gap analysis shown in Figure 4 above suggested that problems with a lack of consistency between plans may be more prevalent outside of the MDB than within. Here we take an integrated look at how each of the concepts that explain drivers and constraints to consistency are expressed both within and outside of the MDB. The discussion here doesn't go into detail about each concept – that detail is provided later in the report. Instead, Figure 4 shows the overall pattern of responses, and key features are highlighted in the text to inform the later discussion.

In Figure 4, each of the stacks in the bar chart shows the number of times that interviewees within and outside the MDB mentioned a specific driver or constraint to consistency. Five apparent differences in experiences of consistency are worth noting:

- Constraints to consistency are the dominant force in all but three areas. The exception outside of the MDB was *strategic environmental features*. Within the MDB both *institutional frameworks*, and the *timing* of planning processes were mentioned an equal number of times as constraints and drivers to consistency;
- *Environmental features* were mentioned nearly twice as often as drivers and constraints to consistency outside of the MDB than within, making this the single biggest discrepancy in the number of times an issue was mentioned between areas. The difference is greatest in relation to *obvious environmental features* which was mentioned more than three times as often outside the MDB than within*;*
- Within the MDB, the most commonly mentioned constraint to consistency was from a lack of *support* within the institutional frameworks;

- Constraints due to lack of *knowledge* were mentioned within the MDB, but knowledge was not mentioned outside; and
- Constraints to consistency operating *within spheres* were only mentioned outside of the MDB.

Detailed results for drivers and constraints to consistent planning

This report now begins its explanation of the drivers and constraints to consistency between NRM plans. The earlier sections deal with issues that were mentioned most often, while later sections report on those that were mentioned less. Figure 5 summarises the drivers and constraints to consistency by each of the features of consistency between plans. Table 3 – below the graph – gives a definition of the cross-cutting issues by summarising the common features of each quote counted within that section of the chart. The cells of the table also give links to the full set of quotes, so that readers can see what practitioners have said in relation to each of these issues.

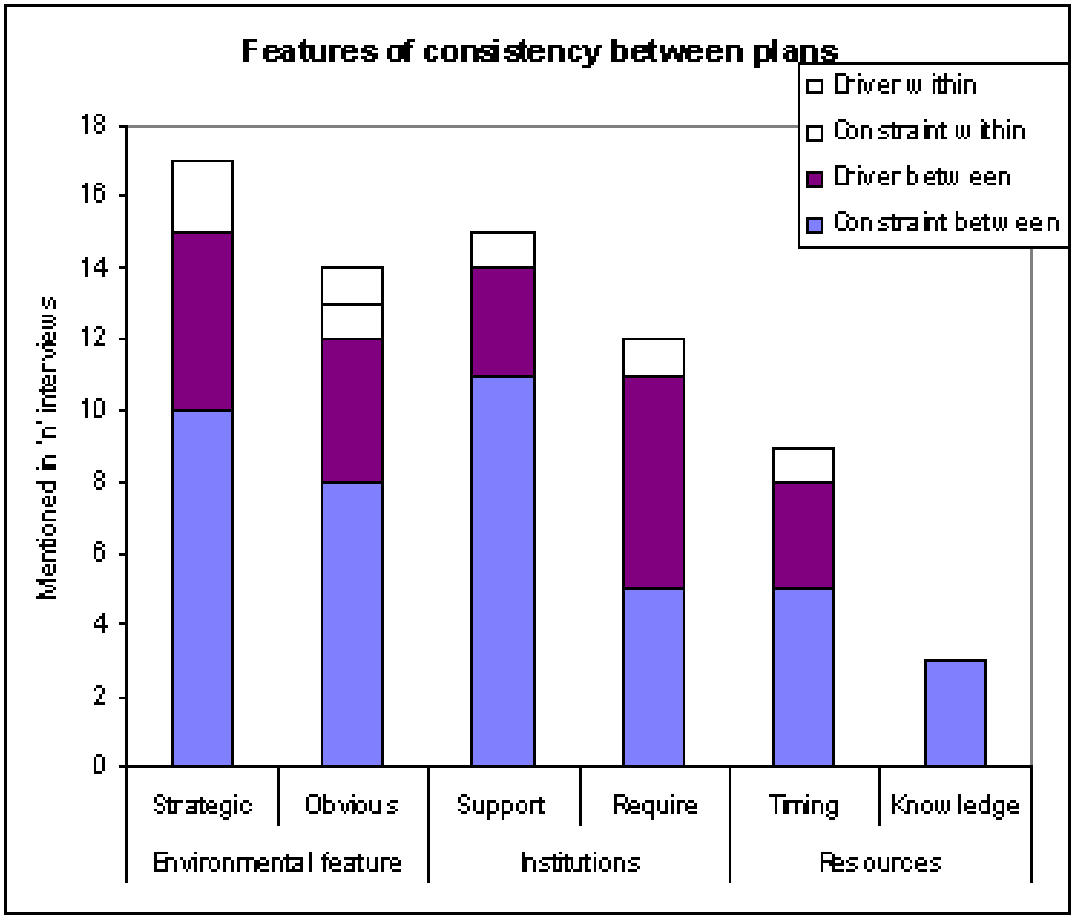

Figure 5 - Features of consistency between plans

Table 3 – Definitions of drivers and constraints to consistency between plans

	Environmental features		Institutional frameworks		Resources	
	Strategic	**Obvious**	**Support**	**Require**	**Timing**	**Knowledge**
Constraint between spheres	Poor combination and application of long-term goals in all sphere's plans	Clear environmental problems omitted from some sphere's plans	Customs or practices undermine consistency between plans	Customs or practices restrict consistency between plans	Not enough time or wrong timing for consistency between plans	Not understanding how to proceed towards consistency between plans
Driver between spheres	Skillfully combining and applying long-term goals in all sphere's plans	Clear environmental problems included in all sphere's plans	Customs or practices encourage consistency between plans	Customs or practices force consistency between plans	Available time or the right timing for consistency between plans	Understanding how to proceed towards consistency between plans
Constraint within sphere	Poor combination and application of long-term goals in an agency's plans	Clear environmental problems omitted from an agency's plans	Customs or practices undermine consistency within an agency's plans	Customs or practices restrict consistency within an agency's plans	Not enough time or wrong timing for consistency in an agency's plans	Not understanding how to proceed towards consistency between an agency's plans
Driver within sphere	Skillfully combining and applying long-term goals in an agency's plans	Clear environmental problems included in all of an agency's plans	Customs or practices encourage consistency within an agency's plans	Customs or practices force consistency within an agency's plans	Available time or the right timing for consistency in an agency's plans	Understanding how to proceed towards consistency between an agency's plans

Environmental features

Environmental features is a broad analytical category. It is defined as "the prominent and conspicuous parts of the environment, including ecosystems and their constituent parts, natural and physical resources, qualities and characteristics of locations and the social, economic, aesthetic and cultural conditions that affect or are affected by them".

Environmental features are often detailed within NRM plans, which state how these are to be protected, managed or enhanced. Two approaches that together were mentioned in over two-thirds of the interviews were through *strategic* and *obvious* actions.

Strategic

> "Its important to take into account regional and state priorities. And we have to take into account legislation like state policy. But there is a case for making sub-regional strategies have a local focus, regardless of what other levels of government want. We shouldn't always be trying to tailor what we do at a local level to the ideas that they have in the other spheres. A good example of this is in the lack of cross-tenure approach in the karst area. We are trying to work on that now. The SG would do its own thing, and manage its own land and impose its own ideas on managing it. Their priorities need to come through in the local context, regardless of whether there are state priorities that don't conform with it." *Tasmanian LG and regional NRM environmental officer.*

The analytical category of *strategic* NRM planning is "the skillful combination and application of long-term goals towards NRM outcomes ".

A key theme among calls for strategic approaches to ensure consistency is that planning processes need to take account of local insights, not just impose ideas from outside on the local spheres. This is useful both for ensuring the right mix of initiatives, and for allocating a suitable set to LG for implementation. So strategic planning means both anticipating environmental outcomes, and the LG institutional responses to the substance of plans.

In answer to questions on consistency, several of the practitioners interviewed expressed frustration at strategic priorities imposed by other spheres. But they usually recognised that broader priorities will at times confer legitimate constraints on NRM actions, and often expressed strong views on the need for greater attention to strategic environmental planning. Examples include restrictions on groundwater use, and the urban development of prime agricultural land as well as the need to tackle weed infestations early, and at the tops of catchments.

Strong, large-scale plans that impose strategic constraints on development can help LGs to approach sustainability by backing up a junior officer's refusal to approve unsustainable proposals from local developers. At times environmental experts within councils – who are typically junior officers – will quietly applaud such strategic planning from above, while councillors or senior managers from the same LG may attack them at a political level. Hence the clear articulation of strategic environmental goals within regional and broader plans is an important aspect of their potential for NRM leadership.

Obvious

> "consistency between plans is vital, but only if all of the spheres have access to the same data. Or there is acknowledgment that the same standard of data will be used for all of the plans. We will use the gut feeling along with scientific data. The state government doesn't have access to the gut feel, so they only use scientific data.
>
> We have only had a requirement for consistent plans with the SG since 2000. And the SGs have not yet done any work for linking in to the existing LG plans. So the question is what is the real source data for the plan? Is it the government looking 50 years ahead from the top down, or should it be from the last 50 years of knowledge form the ground up. The latter will drive local planning." *South Australian environmental manager*.

The analytical category of *obvious* NRM planning is "NRM challenges and outcomes that are easily recognised and understood".

It is common for LGs to claim a monopoly on knowledge about obvious local environmental priorities, that aren't well expressed in scientific literature or broad planning schemes. People who have lived in an area for a long time, or who have worked on the land feel that they have a better sense of local issues than those who make plans from a distance. This sense that local people know about the obvious environmental priorities is consistent with the high value placed on face-to-face interactions and direct observations as ways of learning about NRM challenges.

The key way that LG practitioners recommend that others incorporate obvious environmental features into large-scale plans is to proactively involve local practitioners in relevant planning processes. Again, this can be assisted by involving LGs in two-way communication about what LGs see as important, and what they can contribute to implementation. The NRM manager who provided the following quote also claims success in swaying LG priorities through clever explanations of the implications of obvious environmental problems.

"You have to con them to make it happen. You have to put it into a context that makes it matter to them. If I ask them to do weed management plan they may not. I say, you manage your roads for safety, lets manage Mimosa so that it doesn't become costly." *Northern Territory manager of state government NRM agency*.

Institutional frameworks

Institutional frameworks are the " organisations, customs or practices that support coordination of NRM efforts". Along with people, they are involved in making connections between NRM agencies, which may either *support* or *require* them to make NRM plans consistent (see coordination report). Conversely, flawed institutional frameworks can impede consistency between plans.

Support

"We need other expert groups to get together as well not for local governments to have to coordinate it. We had this time when we were working on our planning scheme, where we got all of the other agencies in to talk about it, so that we were all sitting around at the same table. They all had arguments with one another. It was interesting for us to see which agencies were having the trouble, but it didn't help us to get the plans written at all." *Northern New South Wales LG Group.*

"In regards to local government there are projects to ensure that this happens. The Local Government Association of Queensland NRM

> Facilitator is involved in this. He has been working with the NAP [National Action Plan for Salinity and Water Quality] associated LGs. A lot of regions have put in processes. So the Regional NRM Board has been employed to do a plan, and he has been taking components of the plan out to LGs, and showing the targets in the plans, and then talking with them about whether the plans will work." *North Queensland regional NRM facilitator.*

The analytical category of supporting consistency between plans is defined as "to uphold and aid the links between elements of NRM plans".

The first quote on support for consistent planning gives an example of broader institutional arrangements being an interesting spectator sport for LG, without providing any practical support. The frustration caused by observing such disagreement in the planning process ended up constraining the development of plans between spheres in this case. The second quote gives an example of support being driven between spheres. The NRM coordinator mentioned here engaged in meaningful and timely discussions with a range of agencies to find solutions to planning problems.

Unfortunately, the interviews revealed more constraints due to lack of support, than drivers due to the presence of effective support for consistent NRM plans. This was one area where there were

Require

> "Not very and they are the wrong way around. We have an IPA planning scheme going on at the moment, and we are going through the assessment test at the moment. And I know for a fact that that assessment test doesn't consider what is in the NRM plans. We are going to include NRM issues, but they will be the NRM issues that we see as worthwhile, not the ones that they want. They want buffers of 100m from the creek edge, but we grow cane up to 20m. Our plan will represent reality." Northern Queensland LG Manager

> "The process isn't matured. And they are not really at the same level. The sorts of strategies that we have don't have the capacity to conflict with LG plans, because they have a different purpose and a different statutory basis. This regional plan doesn't have the authority to dictate to LGs what they should and shouldn't do. So it hasn't got any statutory authority." Western Australian Wheatbelt Regional NRM Faciliator

The analytical category of requiring consistency between plans is defined as "to use authority to impose a need or occasion for linking NRM plans".

Although this analytical category suggests an authoritative imposition for linking NRM plans, there is no evidence among practitioners that such a system exists. Rather, there is a sense that more formal, and authoritative requirements for linkages are needed. The challenge is in working out how best to achieve this. LGs have long produced

Resources

Resources for achieving NRM outcomes are a subject of one whole report in this set, and include money, knowledge, commitment, statutory authority and timing. Just two of these resources were mentioned frequently as being important to ensuring consistency between NRM plans. These were *timing* and *knowledge*.

Timing

> "The problem with the LEP [Local Environmental Plan] process is that its hard to amend. It doesn't matter when another document comes out, if you could then change the LEP to be more in line with it that would sort out the timing problem. You can easily bring in a

> Development Control Plan that references those other documents. But the DCP doesn't have any legal force.

The analytical category of timing is defined as " either the available time or the right timing for undertaking successful NRM actions".

LG statutory planning processes impose rigid limitations on when and how LGs may write and amend their plans. These statutes are established by state governments, which are also key stakeholders in the development of regional environmental plans. But the departments dealing with LG's statutory plans are the LG or planning departments, while it is departments of natural resources or primary industries that deal with the regional NRM plans. There is a strong sense among LG practitioners across Australia that state government departments have not yet arranged their various planning requirements so that consistency between plans is achieved.

The planning process currently being undertaken by the regional NRM agencies adds a further level of inconsistency since the timing and direction for this come from the Australian government, which is a further step removed from LG planning. As a result, regional NRM planning is out of step with LG planning, and few LGs have had an opportunity to incorporate regional NRM goals into their formal planning schemes. The constraints are not so pronounced within the MDB, probably because regional NRM planning has been established for longer there, with a more long-term concerted effort to coordinate the goals of integrated catchment management into LG plans, and vice versa.

Knowledge

> "Planning hasn't been consistent. The problem is that local environmental plans are obsessed with identifying what might be able to occur in a place in the future. The CMAs [Catchcment Management Authorities] are concerned with the current activities on land. That's

why I think that we could develop a framework for a much better environmental plan. I think we need a far more holistic approach, similar to the New Zealand model of a resource management approach to activities. I don't know how you would make it work, but I am sure that there is a better way to integrate current and future activities under an outcomes driven planning scheme not an activity-driven planning scheme." *Northern New South Wales LG Chief Executive Officer*

"The problem is that because LG are followers, their attempts at action are not very good examples. They have tried in the last few years. LG at least attends meetings of the CMA." *Southern Queensland Regional NRM Officer*

The analytical category of knowledge is defined as " an understanding of how to proceed towards NRM outcomes, comprising both actions and the context in which they are performed".

The quotes presented at the start of this section appear contradictory in their expression of LG capacity to supply the knowledge for NRM planning, but they have some common ground. Both of these practitioners recognise that there is not yet a sufficient knowledge base within LG or between LGs and regional NRM agencies, for developing truly effective NRM plans. Both also recognise a need for LG to look outside of its current planning processes to gain new insights for NRM planning. The report on learning about NRM problems gives insights into how LGs and regional NRM agencies are gaining new knowledge about NRM. This could give guidance for agencies seeking to enhance both LG and Regional NRM agency knowledge for ensuring consistency between their plans.

Chapter 14: Engagement in NRM programs

Resilience – inside-out report

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> "If they are to help engagement in the new areas of environmental research and action – like native vegetation mapping – they need to help us employ someone for 12 months or so, to affect an NRM win in the community. It needs to be more than a short 6 week initiative that will just make a plan that ends up on the shelf. You really need 3 year rolling funding for these issues. If you have had an NRM issue evolve over 100 years, you will need more than 6 months to fix the problem. You need to get out into the community and establish trust to start turning around how they think about these issues. This is needed within each target area." *South Australian LG environmental manager – less engaged LG.*

Executive summary

LG engagement in NRM programs is a key to the success or failure of those programs, but is rarely explicitly studied. *Resilience* studied engagement both by selecting a balanced mix of more and less engaged LGs to contribute to the project, and by asking interviewees to explain the forces that drive and constrain engagement.

The results show considerable agreement among local and regional NRM practitioners about both the meaning of engagement, and whether any specific LG has a high or low level of engagement. To remove any confusion, it seems that if engagement of LGs in NRM issues continues to be investigated, it is most wise to recognise three levels of engagement, or "the degree of involvement in NRM projects and strategic NRM initiatives" as follows:

- **High** – actively involved in a range of NRM projects *and* in strategic NRM initiatives including Boards of regional NRM committees, consultative committees working on regional plans, or other strategic initiatives that contribute to those plans,
- **Moderate** – actively involved in a range of NRM projects funded through national or state initiatives or forming part of the implementation of NRM plans, and
- **Low** – involved in none or very few NRM projects funded through national or state NRM initiatives, or forming part of the implementation of NRM plans.

This report describes forces that NRM practitioners recognise as driving or constraining engagement. Most of these forces are also important as resources for achieving NRM outcomes, including people,

money, roles, knowledge, and commitment. Connections, achieved through practical and coherent relationships between agencies are important for both engagement in and coordination of NRM programs. The force of *initiatives* was raised for the first time in this analysis of engagement. These initiatives are sparks that begin a process of engagement, and often lead to the allocation of resources, which may then further drive engagement.

Overall the findings suggest that engagement is built up over time, through good resourcing, strong relationships and the reinforcement of positive experiences. Engagement cannot be achieved through short-term, disconnected ideas that are imposed by outsiders to local areas.

Background and context

Resilience is a Land and Water Australia project aiming to enhance local government capacity in Natural Resource Management NRM. Its focus is on improving the understanding that different spheres of government have of one another generally, and of NRM efforts in particular. Resilience is working with 28 local governments – four from each state – and the regional organisations they work with on NRM issues. All participating LGs face serious, multiple NRM challenges. They have mixed levels of prior engagement in regional, state and national NRM initiatives.

The inside-out reports present results from 52 in-depth interviews conducted during 2004 and 2005 with 79 officials from participating LGs and the NRM agencies that they work with on NRM issues. Their primary purpose is to provide insights to state and national agencies about local perspectives NRM issues and initiatives.

Grounded theory and action research methods provide the analytical framework for the inside-out reports. Details on the use of these methods, and the specific techniques that were used are provided in Resilience Methodology Report. A short brochure gives further background to the overall project.

Background to the Engagement report

LG engagement in NRM programs is one of the major themes for *Resilience*. Prior to this project, all major Australian studies, strategies, conferences, off-the-shelf models and other collected work of LGs environmental contributions have focused almost exclusively on the experiences of 'LG leaders'. But relatively few LGs are leaders, staying ahead of the game, and helping to drive the initiatives that they are involved in. And those that are tend to be on the rich, compact and populated end of the highly varied spectrum of Australian LGs. The insights from other, less engaged LGs have been largely omitted from public inquiry into the constraints and opportunities facing this environmentally significant sphere of government. (see Wild River 2005).

Resilience is different. It recognises that the only way to truly understand the distinctive challenges to engagement that are faced by the majority of Australia's LGs is to ask less engaged LGs what might help or stop them from getting involved in NRM programs. This is hard to do because there are no formal registers of more and less engaged LGs, and identifying a LG as less engaged can be insulting and politically treacherous. Resilience achieved its goal of working with less engaged LGs by combining this major theme with another of 'multiple, serious NRM problems', and working with pairs of LGs that each faced similar NRM problems, but had different levels of engagement in

relevant NRM programs. The levels of LG engagement were determined by LG Associations within each state, based on the knowledge of the environmental professionals within those associations.

At no stage has Resilience reported on the level of engagement held by any individual LG. Instead, LGs were asked during interviews what level of engagement they had previously had, and their responses were compared with the observations of LG Association environmental experts.

Figure 1 shows the results from questions about engagement, compared with the insights from the LG Associations. Engagement was not considered to apply to the regional agencies that LGs work with on NRM issues, since engagement with NRM initiatives is their core business. In addition, environmental experts from one of the LG Associations were unwilling to provide an assessment of the level of engagement held by the four selected LGs in that state.

All 12 LGs that were identified by LG Associations as being more engaged also considered themselves to be highly engaged in NRM programs. 11 of the 12 LGs that had been identified as having lower engagement agreed with this view. Engagement was contested in five cases. One was a LG that had been identified by a LG Association as less engaged, but officials there considered that they were more engaged. The level of engagement in the remainder had not been identified, and LG officials within them were unable to agree amongst themselves about a prior level of engagement.

These results suggest a that there is considerable general understanding and agreement about what constitutes engagement. But some uncertainty remains, and it is worth clarifying what is generally accepted as defining engagement. In each of the cases where engagement has been recorded as *contested*, officials who claimed a high level of engagement cited individual projects as evidence of their engagement, but not contributions to committees or other strategic initiatives. It seems that if engagement of LGs in NRM issues continues to be investigated, it might be most wise to recognise three levels of engagement, defined as follows:

- **High** – actively involved in a range of NRM projects *and* in strategic NRM initiatives including Boards of regional NRM committees, consultative committees working on regional plans, or other strategic initiatives that contribute to those plans,
- **Moderate** – actively involved in a range of NRM projects funded through national or state initiatives or forming part of the implementation of NRM plans, and
- **Low** – involved in none or very few NRM projects funded through national or state NRM initiatives, or forming part of the implementation of NRM plans.

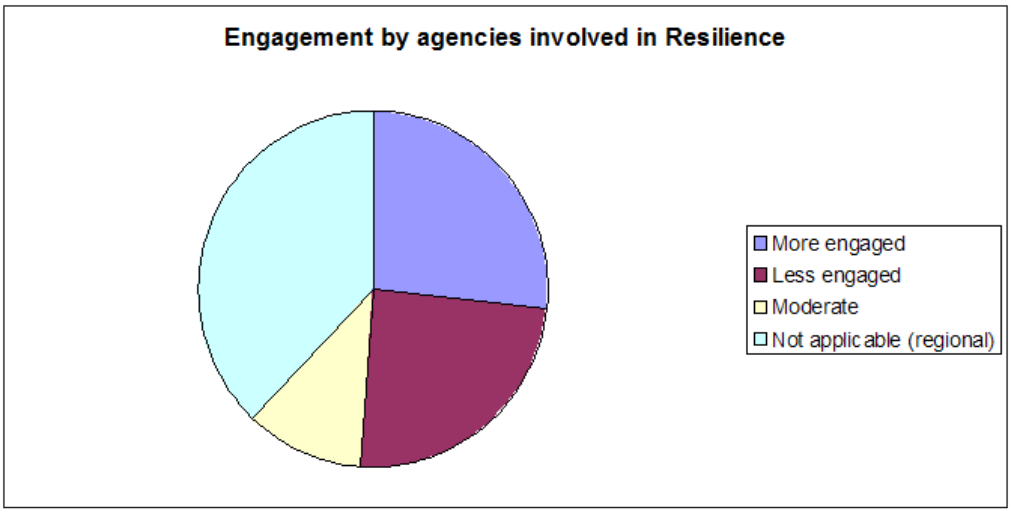

Figure 1 - Engagement in NRM programs for agencies involved in Resilience

Although level of engagement was central to LG sample selection, it did not turn out to be a key descriptive variable for explaining the nature of engagement. Small differences were noted in opinions about various NRM issues between more or less engaged LGs (as seen in reports on Resources, Coordination, Consistency and Data). But there were no apparent differences due to level of engagement in practitioners' analysis of engagement. This again suggests that the nature of engagement, and the drivers and constraints to engagement are relatively well understood by practitioners at local and regional levels, and that it is more useful for this report to explain LG ideas on the nature of engagement than to focus on (apparently non-existent) differences in opinions about them between more and less engaged LGs. Hence the major analytical task undertaken below is to explain the nature of engagement.

Drivers and constraints to engagement

The analysis of engagement in this report has been integrated with another of Resilience's major themes. That is *drivers and constraints by sphere interactions.* This means that the concepts that explain engagement have been considered in relation to whether they are drivers or constraints to engagement, and whether those forces occur within a single sphere of government, or between more than one.

This analysis of engagement bore many similarities to that of resources and it seems that resources are an important key to engagement. All but two of the concepts explaining engagement are also concepts that explain resources. Yet there are important differences between the discussion of engagement, and the discussion of resources more generally. The main points to note are:

- the extra analytical category of *initiatives* does not appear in the analysis of resources. These initiatives are sparks that begin a process of engagement, and often lead to the allocation of resources, which may then further drive engagement,
- the analytical category of *connections* is useful in explaining both engagement and coordination, but did not feature in discussions of NRM resources,
- there were many resource categories that were not mentioned in relation to engagement. They are not discussed in this report,

- the *types* and *uses* of resources were considered as two separate broad categories in the detailed analysis of resources. They are not separated in that way here, because the explanation of engagement did not seem to demand that distinction, and
- the relative importance of drivers, and constraints was reversed in people's descriptions of engagement, compared with their discussions of resources. People focused more on drivers to engagement, than constraints, whereas they concentrated on constraints rather than drivers of resourcing. The differences are shown in Figure 2. Respondents were thinking more of how engagement could be increased, than what is wrong with the current system. Despite that, many of the statements that focus on what could be done better also include a statement about what is wrong at the moment.

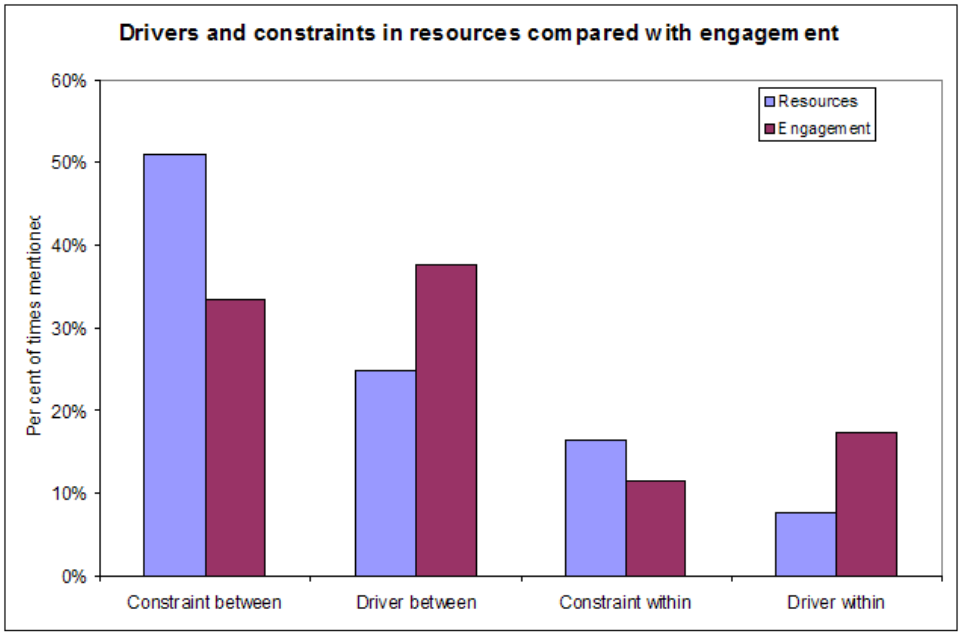

Figure 2 - drivers and constraints to resources compared with engagement

Figure 3 shows the set of concepts, or analytical categories that explain LG engagement in NRM programs. These are all forces that can drive engagement if they are present and operational, or may constraint it if they are absent or dysfunctional. The stacks within each bar on the chart show whether these were mentioned as drivers and constraints, and whether the focus of the comment was on forces operating within or between spheres of government.

Table 1 – below the graph – gives a definition of the cross-cutting issue by summarising the common features of each quote counted within that section of the chart. The cells of the table also give links to the full quotes so that readers can see what practitioners have said in relation to each of these combined forces and drivers and constraints by sphere interactions.

The most commonly mentioned force for enhancing engagement was people, followed by money, and initiatives. Less commonly mentioned were the formal NRM roles of LGs, and knowledge, connections and commitment. The remaining sections of this report focus on each of these forces in turn.

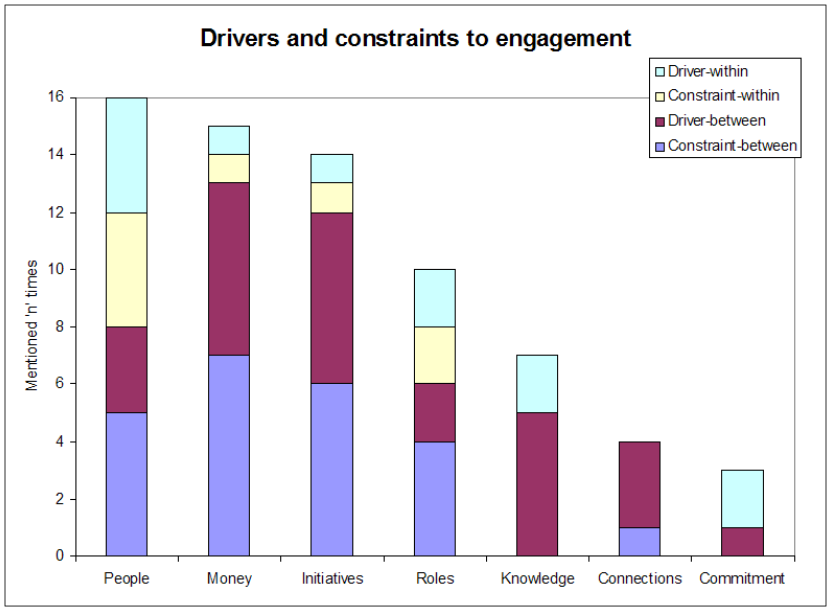

Figure 3 - drivers and constraints to engagement

	Driver between	***Constraint between***	***Driver within***	***Constraint within***
People	Enough knowledgeable, skilled people working between spheres	Lack of knowledgeable, skilled people working between spheres	Enough knowledgeable, skilled people working within spheres	Lack of knowledgeable, skilled people working within spheres
Money	Cash to invest achieving inter-sphere NRM outcomes	Lack of cash to invest in achieving inter-sphere NRM outcomes	Cash to invest achieving NRM outcomes within spheres	Lack of cash to invest in achieving NRM outcomes within spheres
Initiatives	Programs driven from outside work for LG	Programs driven from outside don't work for LG	Programs driven locally work for LG	Programs driven locally don't work for LG
Roles	Having the necessary formal, statutory responsibility to achieve inter-sphere outcomes.	Lack of necessary formal, statutory responsibility to achieve inter-sphere outcomes.	Having the necessary formal, statutory responsibility to achieve outcomes within a sphere.	Lack of necessary formal, statutory responsibility to achieve outcomes within a sphere.
Knowledge	Lacking knowledge to achieve inter-sphere outcomes	Having knowledge to achieve inter-sphere outcomes	Lacking knowledge to achieve outcomes within a sphere	Having knowledge to achieve outcomes within a sphere
Connections	Lacking practical relations and coherent	Having practical relations and coherent	Lacking practical relations and coherent	Having practical relations and coherent

	Driver between	***Constraint between***	***Driver within***	***Constraint within***
	relationships between agencies	relationships between agencies	relationships within agencies	relationships within agencies
Commitment	People working between spheres lack the political and personal will and intention to achieve outcomes	People working between spheres have the political and personal will and intention to achieve outcomes	Within spheres, people lack the political and personal will and intention to achieve outcomes	Within spheres, people have the political and personal will and intention to achieve outcomes

People

> "Staffing. Don't give it to someone who already has a million jobs. We just get so loaded up. It won't be effective unless someone can concentrate on it. The same people do all of the work all of the time."
> *Western Australian Wheatbelt LG Group*

The analytical category of *people* working on local NRM issues is defined as "knowledgeable, skilled, committed people with regular, up-to-date connections with environmental issues and broader communities of experts. They may be LG councillors, officers, managers, community members and may work on either a local or regional basis, servicing several LGs."

Peoples was mentioned 5th most often as a resource issue, but most often as a driver or constraint of engagement. Very balanced across drivers and constraints of each kind. People not being involved properly in defining projects and are therefore frustrated by the ones that come up. There aren't enough people, and LGs have trouble attracting and retaining good people in remote areas.

Driving engagement requires a person who is dedicated to NRM, and has the time available to focus on NRM issues, learning about them, making connections between them and educating councillors, other staff and the local community to these issues. In many cases these people have been able to attract funding, so the real key to effective engagement has been having a person in the first place. However there is not actually enough NRM money to go around, and so if all LGs had access to a person there would be even greater competition for the scarce financial resources available. It is effective to have the people shared between LGs, and employed fully or partially by a regional organisation – indeed that has many merits. But they must spend at least some of their time located within at least one of the LGs that they represent. This is to be part of and understanding LG culture, and to have authority among LGs.

Money

> "They just don't have the resources to do it a lot of the time. In fact I am sure that they don't have the resources. I was working with the ex mayor of the more engaged LG here, and I was amazed that he could keep so many balls in the air. There must be a time coming soon where we fund people to get engaged. You can't just expect them to continue to do it on a personal basis. That is one of the problems with the regional approach to NRM. We expect it to be done on a voluntary basis. We see the same people turning up again and again, and even if we don't pay them, then we need to compensate them in some way. This must also apply to LGs." *North Queensland Regional NRM Agency Manager*

The analytical category, *money* is defined as "cash available to invest in achieving NRM outcomes, which may be flexible, tied to specific initiatives, raised through rates or received through grants."

The overriding constraint related to money is that there just isn't enough available to achieve all of the high priority, established NRM roles, let tackle alone new, emerging problems. Meanwhile the problems are actually worsening constantly, and roles are increasing. NHT has provided some money, but the experience to date has that it has failed to reliably target the most strategically important NRM issues, and this has frustrated local practitioners. Despite this, there is considerable acceptance of, and optimism about the new NHT2 processes.

Initiatives

> "I guess [that engagement is driven when we] both lead by example, and improve the planning system template so that more NRM issues have to be considered in planning schemes as a matter of course. To develop more partnership programs, whether for specific programs,

> or different projects. Like the priority non-woody vegetation project. They have to make the legislation consistent - not give mining and forestry exemptions from the threatened species act. Having said that, the system here in Tasmania is probably one of the best for approaching sustainability in Australia." *Tasmanian LG environmental officer*

The analytical category of *initiatives* is defined as "programs, policies, or processes that take the first organised step in achieving an NRM outcome within a local area".

This is the only category for initiatives that is not also a category of resources. It is about the spark that leads to resources being allocated, rather than the resources themselves. It was also one that was mentioned very often – nearly as often as people and money. There is usually a mention of money and/or people – as these are required to start initiatives and keep them going. But the unique thing in this category is that its focus is on the spark itself – the new thing that is being done to solve NRM problems and achieve benefits.

The main problems are that many of the broader NRM initiatives are not optimally targeted for LG purposes. LGs state that they are not involved well in developing them, or that their focus is inappropriate.

Roles

> "Ask LGs which issues they can make a positive contribution to - not just the things that the federal governments say that we should engage them in. That means that when they are investing effort, its worthwhile. The CMA doesn't have a role in everything that LGs do, and neither does LG in all of the CMA work." *Northern New South Wales Regional NRM Agency Officer*

The definition for the analytical category of *roles* is "the formal, statutory responsibility for undertaking specific NRM actions".

Many initiatives go on to become statutory roles. It would seem logical that this transition would flow from the success of an initiative, but that is not always the case. Often an initiative becomes a formal role when statutory obligations are imposed across a whole jurisdiction for activities that some LGs were previously doing as an voluntary initiatives. In the process, cost shifting may occur, and also the specific approach that had been established may be replaced with a more bureaucrat or expensive one.

> "Then you have the other frustrating side of it. The drum muster. Quite honestly it stuffed up a good system here. It cost us thousands and we shouldn't have done it. When I started here 28 years ago the place was lousy with drums – they were everywhere. We worked together with Department of Primary Industries,, Queensland Cotton, Local Growers, Council and some others and we came up with a drum collection site that we made into a hazardous waste collection area. We bought it, fenced it, put a grid and a gate. The irrigators dug the holes for us. The Cotton growers took on the management of it. They

would check the drums, make sure they were nice and clean, then bury them. When drum muster started they said that couldn't happen. They said that the council had to do the work. We said no - the cotton growers are doing it for nothing. But now they get charged 4c per litre for their drums. The first year it cost us $12,000 because we had all of those drums in stock and couldn't have them paid for." Southern Queensland LG Environmental Manager

Knowledge

"The issues must be relevant, specifically for their own shire, with a proper explanation of why it is relevant and specific. It also needs to come from a credible source. You want to make sure that you don't follow on the next week with contradictory information. It also needs to be something that is manageable and they can deal with. If things are too big they just get scared off. Its OK with the engaged LG from this region - they have lots of staff. But the less engaged LG have essentially 3 staff. They have a very small rate base because half of the shire is state forest and the the state government doesn't pay rates. The LG just has an extremely limited capacity to deal with anything that isn't their core business. And this is a very very small list of their core business. People like me and you become very important. The LG officials need packages of relevant information brought to them, with explanations about why it is important. One of my roles is that when new information about NRM comes out to the councils, I read it for them and highlight any important bits for them." *Southern Queensland Regional NRM Facilicator*

The analytical category *knowledge* is defined as "an understanding of how to proceed towards NRM outcomes, comprising both actions and the context in which they are performed."

Knowledge was never mentioned as a constraint to engagement. However a key feature of new knowledge as a driver is its targeting to the local area. This reinforces the importance of links between science and action that were highlighted in the report on responses to the Outside Information. Most of those respondents felt that the information supplied with that Kit was not specific or applied enough in the local context, even though there had been a good selection of information through the tailoring process.

It seems clear that there is an important, ongoing role for professionals working at local or regional levels to be available to peruse the vast array of new and emerging scientific information about NRM problems and solutions, to focus on those issues of greatest relevance to their local area, and to actively pass that information on to relevant local practitioners. Only then will those in resource-scarce LGs be able to apply new knowledge to achieve effective NRM outcomes.

Connections

> "What would new CMAs do to involve LGs optimally?
>
> Well we would expect to be a member god-dammit. Rolling sleeves up together and working on it. Can't look at it as 'supervising LG'. Sometimes it needs to be political, sometimes an on-the-ground technical. The art of it is in working out which decision goes where and to what level. Taking enough time, and knowing council structure so that issues can't just be raised and voted on there. Sometimes months may be needed to eg go back through the LEP processes, or do a public consultation." *Northern New South Wales LG Group*

The analytical category of *connections* is defined as "having practical and coherent relationships between NRM agencies".

When talking about connections, respondents emphasised that this involves personal, long-term, two-way relationships, not simply letters or bulk mailouts to LGs. Sharing an environmental professional between agencies is an effective way to achieve good connections. There are several models for this around, including:

- environmental officers shared between more than one LG,
- LG liaison officers who are employees of regional NRM agencies and are located within that agency's office, and
- LG liaison officers employed jointly by regional NRM agencies and LGs, and located primarily within LG offices.

The most effective model appears to be the third, since it provides both an active link to the regional agency, and a connection with LG culture. However this observation is based on limited, fortuitous observations, rather than a systematic study. More work would certainly be justified to assess the current extent and success of joint appointments for local and regional NRM outcomes.

Commitment

> "Willingness on the part of council. This includes capacity of the LG in terms of staffing levels. That effects the outcomes. LGs without staff can be involved, but the degree to which they are able to really drive environmental initiatives is very much dependent on staffing levels. When a LG doesn't have any dedicated strategic operators, they get bogged down in the day to day priorities, and strategic work doesn't get done. Good past experiences on projects, and acknowledgment of that helps." *Western Victorian regional NRM manager*

The analytical category of *commitment* is defined as "the political and personal will and commitment to achieve NRM outcomes, including the support of council the community and/or a relevant plan or policy."

It is difficult for an outside agency to increase the level of political and personal will towards NRM. The quote above gives some of the few practical recommendations recorded in this study for enhancing commitment by a LG. Beyond having dedicated NRM staff – already discussed above – this manager suggests acknowledging the good past experiences on projects as a way of building up commitment. As with many of the other drivers of engagement that were discussed here, this

implies that engagement is built up over time, through good relationships and other positive experiences, and cannot be simply applied through short-term initiatives.

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Appendices

Appendix A – Analytical Categories

Analytical categories are the basic building blocks of scientific theories. They are simple concepts that go together to make coherent theories about phenomena. Good analytical categories are complete, mutually exclusive and meaningful. At times, broad categories are broken down into subcategories that add more detail to the concepts. The analytical categories reported here aim to fit all of the data and work in explaining NRM in action (see Kincaid 1996; Strauss and Corbin 1990 – in references).

Consistent with grounded theory methods, the analytical categories listed below have emerged from qualitative analysis of interview results. However the definitions also draw from formal published sources, especially the *Macquarie Dictionary*.

Access: able to be reached and open to influence (see data).

Already had it: the Outside Information was not needed because the agencies either didn't care, or already had this information available to them (see responses to Outside Information).

Between spheres: a force or stimulus whose origin and impact crosses spheres of government, including regional organisation. For instance, it may relate to funds sourced at state level, and distributed through regional organisations to LGs (see analytical themes).

Brief: short and concise statements covering the key information on NRM problems (see responses to Outside Information).

Bureaucratic system: Official government organisations and processes based on principles and rules (see antinomy).

Clear responsibility: Transparent, unambiguous authority in relation to NRM actions (see coordination).

Commitment: the political and personal will and intention to achieve NRM outcomes, including the support of council the community and/or a relevant plan or policy (see resources, coordination, engagement, resilience, weeds).

Conflicting pressures: a struggle or clash caused by the simultaneous exertion of two or more competing forces (see antinomy).

Connections: having practical and coherent relationships between NRM agencies (see coordination, engagement, water etc initiatives, weeds).

Connect local to larger: associating small scale NRM issues with their larger context (see responses to Outside Information).

Constraint: a force stopping or hindering effective NRM (see analytical themes).

Cooperative efforts: helpful willingness in working together to achieve NRM outcomes (see coordination, resilience).

Coordination: clearly ascribed roles where all players know who is responsible for what (see coordination, water etc initiatives)

Cultural details: the set of norms, mores and values that define a community (see antinomy).

Details: a small section of a larger NRM issue, considered as a separate unit (see responses to Outside Information).

Development: the act, process or result of bringing about a new situation (see resilience)

Development opportunities: favourable circumstances allowing actions, processes or results that bring about a new situation(see antinomy).

Diversity: the state or fact of having difference and variety (see resilience)

Driver: a force causing or helping effective NRM (see analytical themes).

Economic conditions: the local financial systems for producing and distributing goods (see antinomy).

Engagement: the degree of involvement in NRM projects and strategic NRM initiatives (see engagement, data). There are three subcategories to engagement:

- **High** – actively involved in a range of NRM projects *and* in strategic NRM initiatives including Boards of regional NRM committees, consultative committees working on regional plans, or other strategic initiatives that contribute to those plans;
- **Moderate** – actively involved in a range of NRM projects funded through national or state initiatives or forming part of the implementation of NRM plans; and
- **Low** – involved in none or very few NRM projects funded through national or state NRM initiatives, or forming part of the implementation of NRM plans.

Environmental features: the prominent and conspicuous parts of the environment, including ecosystems and their constituent parts, natural and physical resources, qualities and characteristics of locations and the social, economic, aesthetic and cultural conditions that affect or are affected by them(see consistency, resilience, antinomy.

Extensiveness-remoteness: degree to which a location is geographically large and isolated (see antinomy).

Face-to-face interactions: personal meetings between individuals in which NRM matters are discussed (see learning about NRM challenges).

Few staff, small community: a low population setting translating to a constrained LG workforce (see antinomy).

Get information from the expert: knowledge, tools or solutions are provided directly from those involved in producing them (see responses to Outside Information).

Good in Kit: the Outside Information successfully delivered the required information (see responses to Outside Information).

Initiatives: Programs, policies, or processes that take the first organised step in achieving an NRM outcome within a local area (see engagement, water etc initiatives, weeds, antinomy).

Institutional frameworks: organisations, customs or practices that support coordination of NRM efforts (see coordination, consistency, water etc initiatives).

Internet: the publicly accessible worldwide system of interconnected computer networks that transmit data (see learning about NRM challenges).

Knowledge: an understanding of how to proceed towards NRM outcomes, comprising both actions and the context in which they are performed (see resources, consistency,resilience, water etc initiatives, weeds).

Leadership: the role of guiding and directing NRM initiatives (see resilience).

Local government effectiveness: the capacity of the local authority to exert a powerful force for NRM outcomes (see antinomy).

Linked: the association between brief summaries and the deeper science from which they are derived (see responses to Outside Information).

Local politics: the principles, science, art or scheming of government that are specific to a local area (see antinomy).

Local priorities: features that are of greater value than others within a specific area (see antinomy).

Long time living locally: individuals involved in NRM programs have lived in the local area, and been actively involved in achieving cooperative NRM outcomes for many years (see coordination).

Money: cash available to invest in achieving NRM outcomes, which may be flexible, tied to specific initiatives, raised through rates or received through grants (see resources, resilience, weeds).

Needed: the Outside Information was inadequate to meet the information needs, even though the concept had merit (see responses to Outside Information).

Newsletters and regular updates: informal bulletins that are relatively current and widely available but not refereed or otherwise rigorously assessed (see learning about NRM challenges).

No gaps, overlaps: a lead agency is specified for each NRM role, and there are no significant double-ups in agency responsibilities (see coordination).

Own observation: Directly perceiving, regarding attentively and watching NRM phenomena in action (see learning about NRM challenges).

People: knowledgeable, skilled people with regular, up-to-date connections with environmental issues and broader communities of experts. They may be LG councillors, officers, managers, community members and may work on either a local or regional basis, servicing several LGs (see resources and coordination, resilience, water etc initiatives).

Perspective: The point of view of conceptual framework of a person that provides their insight into LG environmental issues. There are three subcategories to perspective:

Facilitating: Having a conceptual framework that accepts both other perspectives. Derived from work experience in LG Associations, or with both LG and another sphere of government, including a regional organisation or a regional office of a state agency.

Inside: Seeing LG environmental issues from a local perspective. Derived from having worked in LG and no other sphere of government.

Outside: Seeing LG environmental issues from a broader perspective. Derived from having worked in regional, state or federal government agencies, but not in LG (analytical themes).

Plans, strategies and policies: the formal written statements that articulate NRM initiatives, thus taking the first organised steps in achieving strategic NRM outcomes (see learning about NRM challenges).

Practical: consisting of, or involving action (see learning about NRM challenges)

Relationships: associations that people have with one another (see antinomy).

Reports and technical information: formal written statements relating details of what has been learned as a result of investigations into NRM matters (see learning about NRM challenges).

Right mode, right audience: information is suitable to those receiving it (see responses to Outside Information)

Roles: the formal, statutory responsibility for undertaking specific NRM actions (see resources, weeds).

Simple: easy to understand, deal with, and use (see responses to Outside Information).

Specific, applied: having a special, practical purpose for improving natural resource management (see responses to Outside Information).

Statutory Authority: a head of power or legal requirement for the local or regional organisation to take NRM actions (see resources).

Strategic: the skillful combination and application of long-term goals towards NRM outcomes (see consistency).

Technical, reliable: drawing from a rigorous scientific base, that may be relied on as a source of knowledge (see responses to Outside Information).

Time: either the available time or the right timing for undertaking successful NRM actions (see resources, consistency, water etc initiatives).

Volunteer workers: people who contribute their services without charge (see antinomy).

Well understood: agencies and individuals perceive the significance and nature of responsibilities, and know how to deal with one another as a result (see coordination).

Within spheres: a force or stimulus whose origin and impact is restricted to one sphere of government, including regional organisation. However it may extend to several agencies within a single sphere – for instance several or all LGs (see analytical themes).

Work: the practical, on-ground work that has a definite impact on NRM problems (see resources, weeds).

Appendix B – Codes used in interviews

The *Resilience* inside-out reports provide on-line links to direct quotes from practitioners interviewed for the project. The interviewees are identified in headers and quote references using codes indicating their:

- jurisdication;
- region within that jurisdiction;
- sphere of government and agency-type; and
- role.

The purpose of this document is to ensure that readers can determine the exact role of each interviewee, without being able to identify who the individual is. Note that the variability of interviewees and settings, and the priority of hiding individual identities means that the codes are not always applied exactly as specified here. Even when the codes are not applied exactly, the essential information on an interviewees role and location should be clear to readers who have taken account of the codes described here.

Headers

Each new interview included in the list of quotes is headed by a line containing codes that describe the role and location of the interviewee, while hiding their identity. When a group has been interviewed, the specific role of the speaker is often identified at the start of an individual quote.

Quote references

Where quotes are included in the text of the inside-out reports, the referencing is more descriptive, and codes are not used.

Jurisdictions

The following codes are used.

- **NSW** – New South Wales
- **Qld** – Queensland
- **NT** – Northern Territory
- **WA** – Western Australian
- **SA** – South Australian
- **Tas** – Tasmania
- **Vic** – Victoria

Regions within jurisdictions

There are 7 state-level jurisdictions. There were two types of locations within each of these. There was at least one interview with each LG, and one with a regional organisation that they work with on NRM issues within each of these. This was most often a regional NRM agency but was sometimes the regional office of a state or territory government agency. The codes used

are as follows. Each code refers to a pair of LGs and the regional NRM agencies that they work with on NRM issues.

- **NSWSth** – West of Canberra. Boorowa and Gundagai.
- **NSWNth** – Inland, on the border of NSW and Queensland. Moree and Gwydir.
- **QldSth** – Inland , on the border of NSW and Queensland. Balonne and Waggamba.
- **QldNth** – Northern Queensland, on the coast, south of Townsville. Burdekin and Bowen.
- **NTInd** – The region to the East of Katherine and the Tiwi Islands. Nyrrangulang Madrulk Ngadberre and Tiwi Islands.
- **NTLG** – South of Darwin. Katherine and Coomalie.
- **WACoastal** – Central coast of Western Australia. Carnarvon and Shark Bay.
- **WAInland** – (also 'Wheatbelt' when quoted in text) – The northern end of the Western Australian Wheatbelt. Morawa and Perenjori.
- **SAPort** – (also SA) – On the North-Eastern side of the Yorke Peninsula. Port Pirie and Northern Areas.
- **SAMDB** – In South Australia, and within the Murray Darling Basin. Coorong District and Southern Mallee.
- **TasNth** – (also Tas) Northern Midlands and Meander Valley.
- **TasSth** – (also Tas) Southern Midlands and Central Highlands.
- **VicWest** – More Western of the four LG agencies included in the Victorian sample. Northern Grampians and Loddon.
- **VicEast** – More Eastern of the four LG agencies included in the Victorian sample. Greater Shepparton and Campaspe.

Agency types

There are three agency-types represented in the sample. They are:

- **LG** – local governments;
- **RegNRM** – regional NRM agencies (for example Integrated Catchment Management Organisations, Natural Heritage Trust Boards or organisations); and
- **SGreg** – regional offices of state government agencies (for example the Katherine office of the Northern Territory Department of Primary Industries and Environment). When these are also the formal regional NRM agency, they are referred to as a regional NRM agency.

Roles

The following codes are used.

- **CEO** – Chief Executive Officer. Used if there was more than one CEO that fitted the rest of the codes. Otherwise 'manager' was used because there was always potentially more than one of these.
- **Mayor** – Mayor or president of a local government.
- **Cr** – other Councillor, or elected member of a local government.

- **Officer** – (or off) Officer
- **Facilitator** (or facili)– Regional NRM agency Facilitator – whether working within a LG or a regional agency.

Appendix 1

LWA, ANU43. Resilience, Inside Information.

Appendix 2

Appendix 2.1 - Survey

Introduce Su and Resilience

Su

- Working with local governments on environmental issues since 1990
- Doing independent research into local government and the environment since 1997
- Testing some theories or themes from previous research.
- Using the outside-in, inside-out model, with both LGs and the regional organizations they work with on environmental issues.
- Trying to work with the local governments that need NRM input the most – facing greatest range of NRM challenges,
- Trying to understand what works and doesn't work in engaging LGs in regional initiatives.

I am planning to touch-type your responses, and do mostly qualitative data analysis. If anything I produce could identify you or your council to a reader, I will obtain your approval before publishing it or passing it on.

Role

Name and position

Name, organization, job title.

Environmental strategist

Do you see your role as helping you to achieve any personal environmental goals?

Outside-in and inside-out perspectives

Thoughts on antinomy

Interviewee perspective

Perspectives on NRM – outsiders don't understand

What do outsiders not understand about the inside?

Perspectives on NRM – outsiders understand

What do outsiders understand about the inside?

Perspectives on NRM – insiders don't understand

What do insiders not understand about the outside?

Perspectives on NRM – insiders understand

What do insiders understand about the inside?

Important local environmental challenges – inside-out

What do you perceive to be the most important environmental problems in the local area?

Learning about NRM issues

How do you learn about those challenges?

Useful NRM information

What has been the most useful piece of information you have received about this issue in the past?

Important local environmental challenges – outside-in

Here is some outside-information that I have put together for you. It aims to extend the National Land and Water Resources Audit outcomes to make them more useful for local governments.

Have you heard of or read any of the Audit's findings?

This outside information includes: NRM summaries; useful maps; transparencies of LG areas; action-oriented information. It is all tailored to this LG area.

Consistent outside and inside priorities

Do the priorities you can see here match up with your local perception of natural resource issues?

Gap analysis

This survey is being developed jointly with the research team from the RIRDC General Call project. It aims to identify priorities for improving the delivery of NRM programs to local governments (and perhaps to local land managers).

This outside-information kit extends the Audit findings in five main ways, and I want to know if that is useful.

1 Highlights LG NRM issues?

How important is this selection of just a subset of the Audit maps to present to LGs?
How effective is this in presenting issues that matter to you?

2 Very brief summary

This information gives two paragraphs that summarise why an issue matters, and its status.
How important is a very brief summary?

How effective are the two paragraphs that are provided?

3 OHTs to locate own area

How important is it to be able to locate your area within this national context?
How effective is this approach, using overhead transparencies?

4 Science and action together

How important is it that scientific information links directly with actions?

How effective is this approach to doing that?

5 Face to face

How important is it that NRM information is delivered face to face?

How effective is this approach to doing that?

The next set of questions are in the same structure, but are more general.

6 Data

How important is it that local people are involved in gathering environmental information for national or regional reports?

How effective are current options for getting local input into national or regional databases?

7 Coordination

How important is it that the NRM efforts of different spheres of government are coordinated effectively, so that available resources are spent wisely?

How effective has that coordination been in the past?

How effective do you think it will be with the new NRM initiatives?

8 Consistency

How important is it that local government plans are consistent with regional and state plans, such as Catchment Management Plans?

How effective are current processes for ensuring this consistency?

What factors are driving or constraining the consistency of plans?

9 Connections

How important is it that sustainability information makes connections between issues?

How effective is current sustainability information in making those connections?

10 Resources

How important is it that local governments have the necessary resources for their NRM roles?

This would include a funding base, staff, and a statutory authority or ability.

How effective is the provision of these resources to local governments?

Various NRM initiatives (NAP, NHT)

Are you satisfied with the roles that LGs are being offered, and playing in ICM, NHT, NAP?

Other NRM benefits and shortfalls

What have been the benefits and shortfalls of other NRM initiatives.

Level of engagement

How engaged would you say your council has been in state and federal NRM programs?

Helping and stopping engagement

What things help or stop LGs from being involved with state and federal NRM initiatives?

Natural roles for LG in NRM

What are the natural, or ideal roles for LGs in environmental management?

Roles of other spheres

What is missing in the other spheres support of those roles?

Values

Imagine you are making a set of bank notes showcasing local environmental values. They might show either places of high value, or where a big investment is justified to fix a problem. What would be on your bank notes?

Resilience

Resilience is the process of adapting well in the face of adversity, threats or stress. It means bouncing back from difficult situations. Resilience is needed as natural resources degrade. What aspects of this place will help it to survive the impacts of resource degradation?