Organisational change for participatory science research

The Coastal CRC 1999–2006

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Organisational change for participatory science research: the Coastal CRC 1999–2006

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Summary

Coastal research has implications for all those involved in coastal decision-making. In 1999 the Coastal CRC began its research program espousing 'citizen science': the involvement of citizens in the science it was undertaking. But the researchers were drawn from a range of conventional science research organisations. Could the CRC instil the ethos of stakeholder engagement in its research? This study examines stakeholder engagement in the first year of the CRC and again at the research completed in 2006, primarily from the perspective of 36 CRC researchers surveyed. Stakeholder engagement, and even stakeholder-driven research, is now the norm within the CRC. This report looks at how this change in organisational culture was engendered in CRC researchers and stakeholders.

The CRC research was organised in two rounds of projects. In round one, researchers identified research needs. In the second round, the projects were identified around study areas, with stakeholders central to the identification of the research to be undertaken. Stakeholders became co-researchers, will become the owners of the products of the research, and often the funders of further research. This has radical implications for the conventional research stages of proposal through to dissemination, implementation and evaluation, turning research into an adaptive management collaboration with stakeholders.

This stakeholder focus includes implications:

(1)   for funders of research: to allow flexibility in time and methods to give stakeholders a genuine role in the research;

(2)   for researchers: to have the commitment necessary to overcome the many obstacles inherent in engagement in order to obtain the very real benefits that are often forthcoming; and

(3)   for stakeholders: to have the grounds to claim their appropriate place in the research, to ensure the results are relevant, useful and available.

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1   Introduction

In 2001 the Cooperative Research Centre for Coastal Zone, Estuary and Waterway Management (the Coastal CRC) conducted a study into stakeholder participation in the research projects that had been approved up to that point: the first of two rounds of projects. That study collected baseline data on levels of stakeholder participation in research, which is compared with participation in Coastal CRC research in 2006 in the current study. Although the Coastal CRC affirmed an interest in participatory methods through its Decision Frameworks and Citizen Science themes, in Round 1 there had been no formal method for encouraging the use of participatory methods in its research. In Round 2, the CRC restructured project organisation and brought in a range of mechanisms to encourage, facilitate and even compel researchers to engage with stakeholders. This study looks at engagement at the end of the research process and how it compared with engagement in Round 1 projects.

The 2001 baseline study developed a framework for assessing and quantifying attributes of participatory research, which was based on eight factors commonly cited as being potentially problematic in community engagement. This framework was used to produce a quantitative assessment showing the change in stakeholder engagement between 2001 and 2006. The process was expanded here to produce an assessment of the current state of engagement, enabling factors, constraints, potential improvements, pros and cons, and possible explanations for changes that have taken place. In addition to conventional analysis, these results are presented as a report card on the CRC's Round 2 engagement in comparison with Round 1 (Appendix 1), and simple checklists to guide stakeholders, researchers and funders in designing participatory research projects (Appendix 2).

Background information is given in Section 2, including some previous studies and CRC management documents that record the methods the CRC used in encouraging stakeholder engagement. Data was collected by interviewing CRC researchers, stakeholders and management. The details of these methods are given in Section3, which also contains information about the changes in CRC project structuring. The results of the interviews (Section 4) form the bulk of this report. They provide the details of how each aspect of the engagement was carried out by researchers. The main findings are given in Section 5 in the form of conclusions and recommendations.

2   Background information

Many reasons are given for using participatory research methods, but one of the most common approaches is to cite problems with the alternatives. The CRC's web site claims:

> *The adversarial, and often emotive, approach to decision-making on major issues… to date has failed to produce effective social, economic, political or ecological outcomes* (http://www.coastal.crc.org.au/citizen_science/).

The traditional approach to environmental research is the adoption/diffusion model, in which expert scientific researchers generate new technology and information, which is then disseminated to users through trials (Guerin & Guerin, 1994). Advocates of participatory research claim this approach is too uncritical, has been socially and ecologically harmful, is production-oriented rather than conservation oriented, may solve the wrong problems and doesn't take into account the knowledge of users or the social context of the application of the knowledge (Simpson, 2004).

2.1   Frameworks for participation

A framework for assessing the participation process was developed for use in health planning (Naylor *et al.,* 2004). This method divided the opportunities for participation into six factors:

- the identification of need;
- the definition of research goals and program activities;
- mobilising resources to fund and support the program activities;
- the methodology of the evaluation/ research;
- the indicators used to determine the success or effectiveness of the programs; and
- the sustainability of life of the programs.

'Participation' in each of these phases was assessed on a four-point scale ranging from expert-driven research to participatory research:

- consultation;
- cooperation;
- participation; and
- full control.

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The study concluded that the framework enabled the research process to feed back and evolve and to gauge the increase in community capacity over time. They found that the term 'participation' varied in meaning between interviewees and that funding agency guidelines challenged engagement. Evaluation of the participation was complex due to the multilevel nature of the project and they were unable to quantify the participation in this way.

Another framework (NRDC, 2002, see Figure 2.1) places a third of the research emphasis on the post-investigation phase to ensure that the research feeds back into policy and practice.
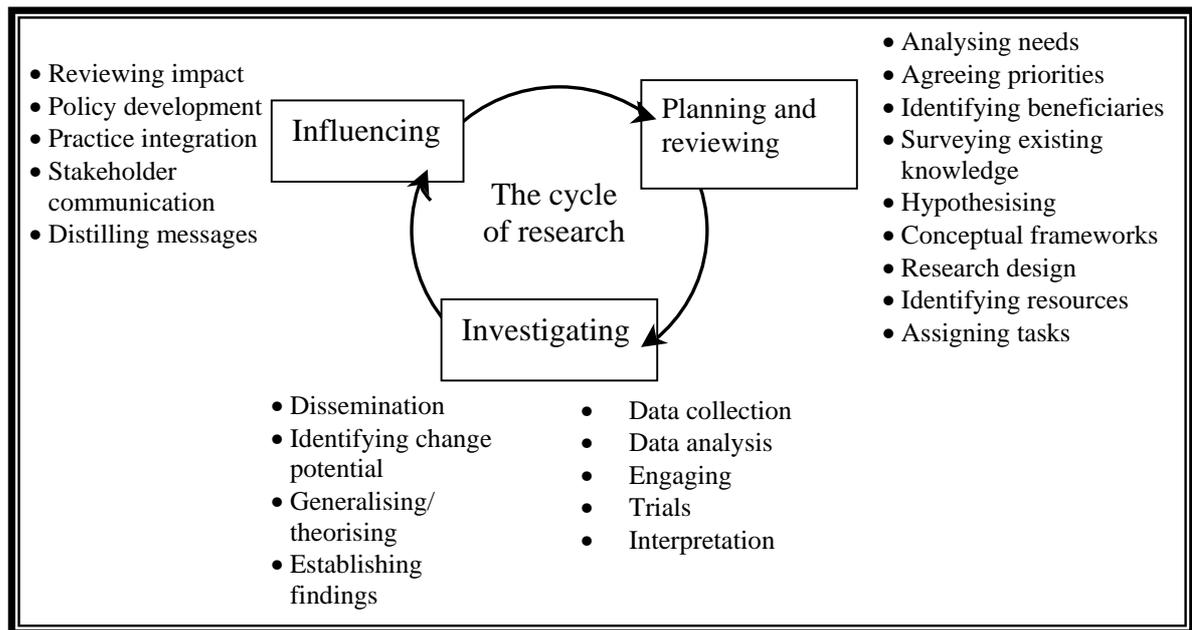
Figure 2.1. NRDC framework for participatory research (after NRDC 2002)

The framework for the current study is that used in the baseline study conducted 1999–2001 (Eisner, 2001, see Figure 2.2 at right).This was based on factors that are known to constrain engagement. This framework is used to allow a comparison between the projects at the start of the CRC and those concluded after seven years of operation. For details of the basis of this framework, see the report for the baseline study (Eisner, 2001).
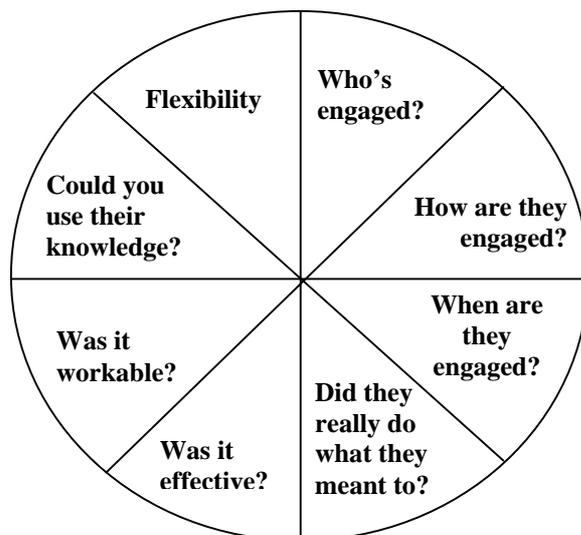
Figure 2.2. Coastal CRC baseline study framework for participatory research adopted in this study
(after Eisner 2001)

2.2   Why engage?

Numerous studies attribute a wide variety of benefits to engaged research, although many are expressed from a purely theoretical or speculative perspective. Table 2.1 identifies the benefits that have been found through direct evaluation of engagement activities, or through comparisons of engaged and non-engaged practices.

Table 2.1. Benefits of engagement identified in specific case study evaluations

Benefit	Source
Enables products to be oriented to on-the-ground problems	Vanclay & Lawrence, 1998
Researchers understand existing practices	Guerin & Guerin, 1994
Researchers are able to reinforce good practice	Guerin & Guerin, 1994
Users can promote needed innovation	Kyung, 2005
Increased user satisfaction	Kyung, 2005
Reduces tension and adversarial relations	Kaplan & McCay, 2004
Increases transparency and accountability	Kaplan & McCay, 2004
Takes into account the needs, constraints and practices of local people	Johnson *et al.*, 2001
Integration of socioeconomic and ecological values	Abal *et al*, 2001
Cost savings	Abal *et al*, 2001
Clear focus on outcomes	Abal *et al*, 2001
Internal engagement increases research productivity	Bland & Ruffin, 1992
Some (though not too much) industry engagement increases research productivity	Blumenthal *et al.,* 1996
Ensures research addresses stakeholder concerns	O'Connor *et al.,* 2000
Enhances the technical quality of the assessment	O'Connor *et al.,* 2000
Provides a forum for stakeholders to share ideas	O'Connor *et al.,* 2000
Facilitates dissemination	O'Connor *et al.,* 2000
Sensitises stakeholders to possible impacts	O'Connor *et al.,* 2000
Legitimises the process to third parties	O'Connor *et al.,* 2000
Improves quality of reporting	O'Connor *et al.,* 2000
Focusses on areas of greatest need	O'Connor *et al.,* 2000
Includes concerns that might have been ignored	O'Connor *et al.,* 2000
Improves analysis of potential impacts	O'Connor *et al.,* 2000

2.3 How people engage

Participatory research methods are commonly applied in the setting of national research priorities (Davenport *et al.,* 2003). Research users now often set these agendas. Some research organisations include stakeholder analysis in their research (Gass *et al.*, 1997). These enable researchers and policy makers to better grasp how their decisions relate to the total social and institutional environment.

Some projects establish an advisory committee to bring together the different sectors with an interest in the project. One example (O'Connor *et al.,* 2000) included industry, NGOs, government agencies and researchers and used initial workshops followed up by electronic or paper-based bi-monthly progress updates, draft scenarios to gauge impacts and draft reports with requests for feedback. Generally, typical engagement methods include media publicity, field days, seminars and publication of findings in newsletters and technical journals (Guerin & Guerin, 1994).

2.4 Effective communications

One review highlighted the importance of effective communications in the engagement process, and went into some detail over attributes that make communications work (Guerin & Guerin, 1994). In true participatory research, the users of that research are not a passive part of the technology flow process: contact has to be a dynamic, two-way flow of information. Participants need to create and share information with one another and interact meaningfully; they need to ask questions of each other. Face-to-face contact is important, and media is no substitute, with end users taking interest in specialist advice offered directly to them. Elitism can be dangerous: it is important to establish respect and empathy. It is also important to use a diversity of communication methods.

Information presentation is an important part of communications and needs to be done clearly, with limited volume and complexity. Researchers tend to generalise, but users are more receptive to information that is specific to their location, climate and time of year. Researchers also tend to favour formal means of communication and the written word, while users have a preference for more informal methods, verbal messages and images. If all that is required is to share information then mass media is useful, but if there is an element of persuasion or partnership-building involved, there is no substitute for personal interaction.

Relying on mainstream journalists can present problems, with reluctance to cover technical material due to difficulty in understanding, and journalists may pretend to understand when they don't. They are also restricted to writing in general terms for a wide audience. Communications can sometimes break down between researchers and communicators, even if they are specialist communicators.

2.5   Engagement constraints

There can be constraints on both sides of the engagement process. Researchers can be reluctant due to their perceptions of academic conventions on the dissemination of scientific information, due to constraints on the type of communication material that is recognised professionally (e.g. in an academic setting, only peer-reviewed journal articles count for funding, not reports to stakeholders), or due to time constraints. Generally, stakeholder participation does not help promotion prospects. It is also regarded as a distraction from their core business of research and/or teaching (Guerin & Guerin, 1994).

On the other side of the relationship, stakeholders may not trust the scientific community, may have poor access to advisory services, may not be actively recruited for the research, not be represented among the researchers, not understand the research process and may have language and cultural barriers to participation (Shavers-Hornaday *et al.*, 1997) .

2.6   What helps?

A number of factors are cited as helping with the engagement process. The credibility of those presenting information is important (Guerin & Guerin, 1994). Guerin and Guerin (1994) suggest the following factors that have been found to influence credibility:

- Practical recommendations
- Take into account economic, technical, social feasibility
- Make recommendations visible
- Having hands-on experience
- Being well informed on user's business
- Understanding the trends
- Being accessible and available

- Being honest and unbiased

- Respecting confidentiality

- Showing empathy

- Respecting community norms

- Being knowledgeable on your subject.

An expert system can help field staff with credibility and reduce information overload. There are many barriers to participation, and having a good understanding of these can help (Shavers-Hornaday *et al.*, 1997).

The participatory nature of the research organisation itself is also important, with leadership that is assertive about participation, is decentralised, has frequent communication and makes resources, especially people, readily accessible (Bland & Ruffin, 1992).

2.7   Who does what?

It is not always the researchers who do the engaging. Some make use of specialist communicators or extension staff or other field staff, who receive support from scientists and other technical experts in universities and research institutes (Guerin & Guerin, 1994). This can be useful because field staff are in constant contact with end users, particularly community leaders. Where professional communicators are used, it is important not to have so many as to break the effective direct communication between scientists and research users that is a prerequisite to adoption of innovation. The scientists should be from institutions where the new technology originates.

These intermediaries need to be people who have a good understanding both of the science and of the on-ground work. They need both training and contact with the researchers. There is a tendency for this role to be non-funded and in some cases it has been taken up by the private sector who have their own commercial interests (Guerin & Guerin, 1994).

The end users who elect to participate in research may not have the characteristics researchers are ideally looking for when they design their engagement process, and it may be necessary to accept less than ideal representation (Davenport *et al.*, 2003). Even if representation is good, there is insufficient stakeholder contact this way to rely on representation alone for getting the message out (Guerin & Guerin, 1994).

Leadership within research organisations plays a crucial role in influencing the culture of the organisation, particularly in terms of prioritising and enabling stakeholder engagement (Bland & Ruffin, 1992). Leaders need to make sense of the organisation's ever-changing situation, but also to translate this sense into the actions of organisational members and other stakeholders (Simpson, 2004).

Further research has been recommended to investigate the effectiveness and feasibility of incorporating an extension component into scientific research proposals (Guerin & Guerin, 1994). This is explored in the current study.

2.8   When to engage?

For many projects, it may be most beneficial to stay engaged with stakeholders all the way through the research process. This can include (Johnson *et al.*, 2001; Kyung, 2005):

- defining problems
- setting priorities
- selecting technologies and policies
- formulating research questions
- monitoring and evaluate impacts
- data collection
- interpreting the results
- identifying implications
- presenting the results to stakeholders.

There are two times when engagement is particularly crucial: the start of the project, when the impact of any resulting policies and regulations on people should be a central concern (Kaplan & McCay, 2004) and researchers need to ensure that end users *need* the results (Guerin & Guerin, 1994); and during the implementation of the results, to fix problems that occur and pick up on any flow-on innovations (Guerin & Guerin, 1994). Much current research stops before this point.

2.9   Adoption constraints

There are a variety of typical reasons why research doesn't get adopted (Guerin & Guerin, 1994). Users may not believe what seems obvious to researchers. They may believe it, and think it represents an improvement, but not use it anyway, because they don't think they'll benefit, it's not perceived as profitable or relevant, it's too hard or unpleasant to learn or use, or for no reason at all. They may have tried, had problems and given up. Another subtle but significant factor may be lack of engagement in the research process.

2.10   Citizen science research in the CRC

At the other end of the spectrum from traditional approaches is participatory action research (PAR). PAR involves users in the research process from the initial design of the project, through data gathering and analysis, to final conclusions and the development of recommendations arising from the research (Guerin & Guerin, 1994). Since PAR is conducted by non-expert researchers, often using facilitators, these methods are not suitable for much of the research conducted or commissioned by professional research organisations. Relatively little biophysical research uses PAR (Guerin & Guerin, 1994); most PAR is conducted in the social science research fields.

However, management of complex systems such as a catchment requires user participation in the research process (Johnson *et al.*, 2001). One study looked at how research organisations had adapted to constantly changing requirements and concluded that 'a dynamic style of organisation that is in a state of endless transition is the most appropriate response to contemporary demands for knowledge production' (Simpson, 2004).

The Coastal CRC proposed an approach to research called 'citizen science'. According to their web site:

> *Citizen science is a participatory process for including all sectors of society—the general public, government and industry—in the development and conduct of public-interest research in order to bridge the gaps between science and the community and between scientific research and policy, decision-making and planning*
> (http://www.coastal.crc.org.au/citizen_science/)

Citizen science was to be achieved through 'social learning; sound research; full participation; adaptive management; development of democracy and active civil society; collaborative planning and decision-making processes'. This was a fairly

revolutionary approach for a research organisation drawing its researchers from government agencies and universities. The principles on which this approach was based are:

- Research begins with stakeholders' needs

- Include all stakeholders

- Stakeholders are co-researchers

- Researchers are stakeholders

- Maximise access to information

- Maximise opportunities for participation

- Encourage multi-party communication

- Develop visions and objectives together

- Allow situations to develop organically

- Provide access to a wide range of knowledge, and to decision-making tools

- Build mutual trust

- Share information and networks

- Share responsibility

- Create transparent decision-making processes

- Aim for consensus and mutual ownership

- Promote cooperative rather than competitive structures

- Monitor and evaluate the collaboration

- Disseminate the results

- Apply the results

- Build on the achievements

- Provide feedback on the process

(from the Coastal CRC's urban research project toolbox, now hosted at Griffith University, <https://www3.secure.griffith.edu.au/03/toolbox/principles.php>).

The CRC also suggested a method for evaluating the engagement in the research. Since this study is attempting to do precisely that, Table 2.2 is derived from these guidelines and shows where the current study addresses these components. As this study focusses on projects and researchers, it does not include information that would need to be obtained from other stakeholders or at the activity level, although this would have been valuable.

Table 2.2. Citizen science engagement evaluation guidelines (Coastal CRC 2003a)

Evaluation guideline	Addressed in this study
What evaluation involves	
• Developing an evaluation framework	✓
• Developing data collection tools	✓
• Collecting and analysing data	✓
• Interpreting, sharing, reporting and responding to results	✓
What might an evaluation consider?	
• Participation level	✓
• Influence of engagement	✓
• Evaluation of individual activities	✗
More specifically, an evaluation might consider	
• Whether the objectives of the engagement were achieved	✓
• How well they were achieved	✓
• Which engagement techniques drew the highest response rates/highest level of participant satisfaction	✗
• To what extent target groups participated in the community engagement, e.g. in terms of numbers and the range of views expressed	✗
• Which techniques were most effective in clearly conveying information and the adequacy of the information	✗
• To what extent participants expressed their views	✗
• How useful the information obtained was	✓
• The impact community engagement had on decision-making	✓
• Adequacy of the timing, funding and other resources	✓
• Cost-effectiveness of the engagement	~✓
• If participation was representative of the diversity of views affected by the issues; if not, why not, and what can be done about it	✓
• If participants from all target groups were adequately represented, including those identified as having special needs (e.g. people with disabilities, from diverse cultural and linguistic backgrounds, including people from an Aboriginal or Torres Strait Islander background, women, young people, homeless people)	✓
• Whether there was an even gender mix	✓
• Whether people with special needs (e.g. disabled access, interpreters, child care) considered that their needs were adequately met	✓
• Whether people from all participant groups feel that they were listened to and their views adequately recorded.	✗

The CRC advocated the citizen science approach in order to

> *ensure that the social, economic and ecological health of this high growth [coastal] zone is maintained and improved; contribute to the development of a vision for the future of the coastal zone and enhanced skills for identifying and responding to the key issues.*
> (http://www.coastal.crc.org.au/citizen_science/)

They claim that this approach is 'vital to sustainable outcomes' and 'central to the ethos of the CRC' (http://www.coastal.crc.org.au/citizen_science/). Coming from primarily traditional academic and government research backgrounds, the CRC researchers had a considerable journey to undertake in adopting a citizen science approach over the seven-year life of the CRC. It is the success of that journey that this study attempts to assess.

2.11   The CRC process

Key CRC documents demonstrate ways in which the CRC attempted to encourage or embed stakeholder engagement. These documents show the commitment the CRC gave to stakeholder participation. The engagement requirements are specified in the following unpublished internal management documents:

- *Guidelines for developing activities, subprojects and regional projects*

- *Phase 2 project development* (project agreement guidelines)

- *Process for reviewing milestones and deliverables*

- *Terms of reference, industrial catchments: Port Curtis Advisory Group, 2003–2006* (Advisory groups' terms of reference)

- *Project advisory group – draft guidelines*.

Summaries of the engagement requirements specified in these documents are given in Appendix 5. The documents show that interventions included providing guidelines for project development and reporting, and by creating criteria for the assessment of projects. These methods provide powerful drivers for stakeholder engagement within CRC projects. Together, they provided a flexible approach that strongly encouraged substantial engagement in research, and provided a dramatic change from the initial round of projects, which did not have such requirements.

The CRC had a number of obvious, formal points at which it could influence the engagement process of its projects. These are shown in Figure 2.3 at right.

There are a number of other ways in which the CRC encouraged engagement. These included setting up and establishing relations with a number of stakeholder groups at the national level and in each of the study areas. It also employed communications staff, web designers and coordinators in each of the study areas and nationally to assist projects in their engagement process and to engage at more strategic levels.
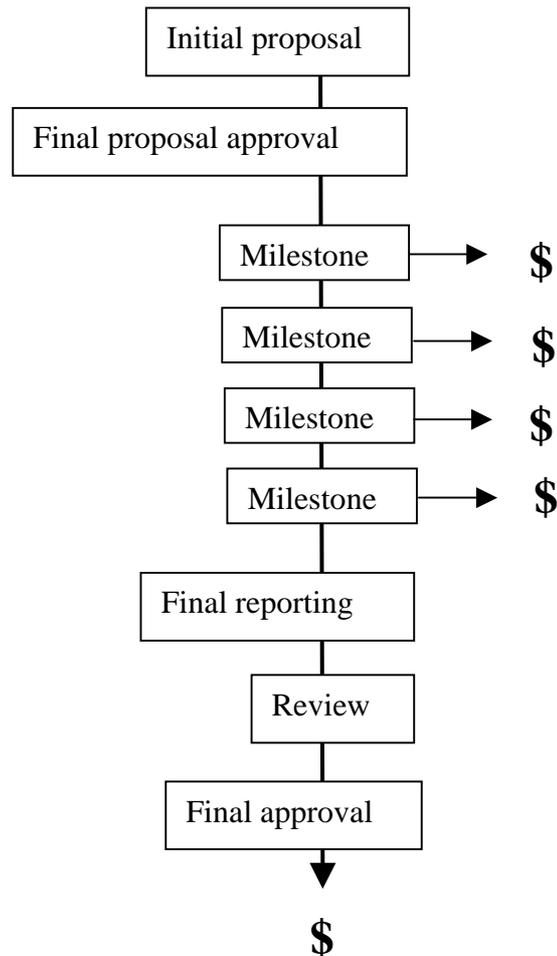
Figure 2.3. Potential intervention points for influencing engagement in Coastal CRC projects

The next section on the methods of this current evaluation describes how the research was conducted in order to assess stakeholder involvement, make a comparison between the two research rounds, identify enablers of and barriers to engagement and create checklists for improving future engagement in research projects.

3   Methods

During Round 1 (1999–2003), the research work of the Coastal CRC was organised by theme, with each theme containing a number of projects and each project containing a number of tasks (Table 3.1).

Table 3.1. Coastal CRC's Round 1 (1999–2003) research structure

Theme				Theme				
Project		Project		Project			Project	
Task	Task	Task	Task	Task	Task	Task	Task	Task

In the baseline study for this research an assessment of the stakeholder participation was made on a task basis.

For Round 2 (2003–2006), in order to be more outcome-focussed, the CRC restructured its research work around study areas, and the task level disappeared as a managed unit, and was replaced by subprojects and milestones (Table 3.2).

Table 3.2. Coastal CRC's Round 2 (2003–2006) research structure

Study area				Study area					
Project		Project		Project			Project		
Sub project		Sub project		Sub project		Sub project		Sub project	
Milestone / Milestone	Milestone / Milestone	Milestone / Milestone	Milestone / Milestone	Milestone / Milestone	Milestone / Milestone	Milestone / Milestone	Milestone / Milestone	Milestone / Milestone	Milestone / Milestone

From a project management perspective, stakeholder engagement can be coordinated at the project or subproject level—or at a level below the subproject level for large, complex subprojects. Some researchers were unclear about which project they were in, whether it was a project or subproject, or they regarded their work as a project even though the CRC regarded it as a subproject.

The approach we took in the current assessment was to start at the subproject level and then focus on a higher or lower level as was relevant to that project. For this reason, comparison with the baseline study is not a direct comparison of equivalent units. The number of respondents is large enough to allow for a comparison of proportions of work within the CRC at the two points in time.

3.1   Selection of respondents

A list of subproject researchers was sent to project leaders and the CRC business manager, who prioritised the potential informants based on their knowledge of the stakeholder participation within their research area. The highest priority informants were selected for a small pilot, during which they were asked who else we should talk to get the full picture of the participation in their research area.

If we were unable to get an interview with the first choice person in the time available, we went further down the list. For a couple of subprojects, we were only able to talk to people who were less well informed about the work and one subproject was not covered at all. In total we had 36 researcher responses from 27 projects, three of which had two respondents (Contaminants dynamics, Central Queensland information paper and Coastal wetlands in urbanised south-east Queensland) and three of which had three respondents (Governance and partnerships, Coastal water habitat mapping and Enabling adaptive management). The full table of projects and number of respondents is given in Appendix 4. In addition, one CRC management and two stakeholder interviews were conducted as a means of cross-checking, but results are not included as researchers were the intended target survey group.

3.2   Questionnaire design

The interview questionnaire was designed around the framework for analysing stakeholder participation used in Round 1 (shown previously in Figure 2.2), and was structured into 25 questions under four headings:

- Context
- Roles of engagement
- Bridges and barriers
- Reflections.

The questionnaire contained categories for classifying projects according to the stakeholder engagement analysis framework. The projects were classified with the researcher during the interviews on scale varying between 3 and 7 points, as shown in the centre of Figure 3.1 at right.
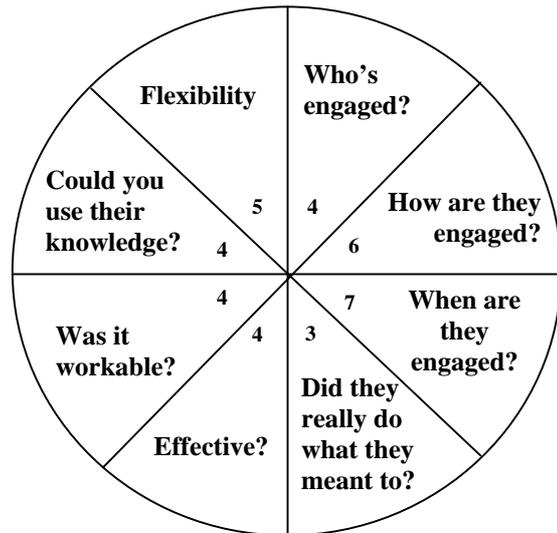
Figure 3.1. Engagement assessment framework showing classification scale

The questionnaire was developed through a review process with the project team and then with a CRC steering group. The project team met to revise the questionnaire again after the pilot.

The questionnaire was emailed to participants prior to the interview so that they had the framework and the classifications in front of them while we were working through the questionnaire (generally by phone).

During the pilot, one respondent filled in the questionnaire in writing and returned by email. After this, it was modified to make the questions and classification categories answerable in survey form.

The two informants who were not part of projects had their own individual questionnaires. All the questionnaires are provided in Appendix 3.

3.3　Survey method

The interview information was collected by a choice of three methods, according to participant preference: face-to-face, by telephone or in writing. Additionally, one of the researchers on this project answered about her involvement in another project. The interviews were conducted by a team of four interviewers. Table 3 shows how the surveys break down by survey method.

Table 3.3. Breakdown of survey methods employed

Method	Number surveyed
Face-to-face	18
Telephone	10
Written	7
Researcher self-response	1
Total	**36**

4   Results

The results in this section present the responses to the survey provided by researchers. These responses have been collated, are occasionally presented as statistics, and are a representation of what the researchers said about the stakeholder engagement in their projects. It should be noted that not all respondents answered all survey questions and, where relevant, this is reflected in the statistics for each question (e.g. 'n = 32' in a particular table or graph indicates that 32 of the 36 participants provided a response for that question.

The headings in this section generally correspond to the questions in the questionnaire (Appendix 3). Therefore, the framework in which this information is presented includes the following subsections:

4.1   Role in the research

4.2   Who were the stakeholders?

4.3   Who was actually engaged?

4.4   Disadvantaged groups

4.5   Mechanisms for including stakeholders in research

4.6   Level of stakeholder responsibility in the research

4.7   Involvement in different stages of the research

4.8   Intentionality of engagement

4.9   Inclusion of different types of knowledge

4.10   Flexibility

4.11   Cost–benefit equity

4.12   Enabling factors

4.13   Engagement constraints

4.14   Effectiveness

4.15   Benefits of engagement

4.16   Disadvantages of engagement

4.17   Potential improvements for stakeholder participation

4.18   What was different about participatory research in the Coastal CRC?

4.19   Changes during the life of the Coastal CRC

4.1   Role in the research

Respondents were asked about their role in the research. The majority of respondents were project leaders (or subproject leaders in CRC parlance). There was some disagreement between what researchers considered to be a project and the CRC's nomenclature. Some projects were internally structured so researchers considered themselves to be running a project or a theme within a subproject.

A couple of respondents were sole researchers, one had a research assistant, while others had PhD students and teams ranging from 2 to 10 people including planners, historians, sociologists, political economists, geologists, geographers, surveying engineers, chemists, hydrologists, modellers, ecologists, remote sensing scientists and applied physicists. In addition to the main CRC research partners, co-researchers came from a wide variety of partners including Brisbane Water, Geosciences Australia and the Defence Science and Technology Organisation.

One project had joint leaders and a number of the project leaders also had other roles including being researchers on other projects, being in a grassroots group therefore also being an external stakeholder, doing web design for other projects and having coordination roles with researchers and stakeholders.

Four respondents had higher-level roles in the CRC. These roles included the business manager, the coordinator for one of the study areas, a theme leader and a research/industry negotiator. Three respondents identified as stakeholders. One was a 'buddy': a member of a stakeholder group set up for one of the projects. Her involvement was intended to provide information relating to the regional NRM bodies and she had become involved through her role in WaterWatch. Another was the science coordinator of the stakeholder organisation with the highest level of interaction with the CRC. Another primarily identified as a stakeholder with a linking role between researchers and stakeholders, though the CRC would see him as a researcher.

Nine of those interviewed were on research teams, mostly having been nominated by their organisations, and their time on projects was their organisation's in-kind contribution to the project. One researcher had been employed by the project and another was employed as an operative, largely in a stakeholder engagement role.

4.2   Who were the stakeholders?

Researchers were asked who they regard as the stakeholders in their research to identify the major players who they felt had an interest in their research. It would also provide an indication of any differences between the stakeholders and those who were actually engaged (Section 4.3). Table 4.1 summarises the proportion of respondents nominating different community sectors as their stakeholders.

Table 4.1. Stakeholder groups involved in research, as identified by respondents

Stakeholders	Percentage and number of respondents (*n=32*)
Government – State – Local – Federal	 72 *(23)* 34 *(11)* 28 *(9)*
Regional NRM/ catchment groups	53 *(17)*
Community groups	53 *(17)*
Researchers	25 *(8)*
Industry	25 *(8)*

A hierarchy of engagement with stakeholders was evident in the responses, and this was specifically noted by one interviewee. The most frequent stakeholder groups were state government agencies, then regional natural resource management (NRM) bodies followed by local government. This is largely a reflection of the expertise and availability of personnel, particularly concerning established collaborative programs and working groups that can support research.

Existing CRC partners have an influence on the choice of stakeholders. Related to this hierarchy of preferred stakeholders is the recognition of two levels of stakeholders: direct and indirect. Direct stakeholders include organisations that have specific and immediate interest in project results, whereas indirect stakeholders have a general interest or provide assistance or information. This split could also be loosely described in terms of research users and those affected by the research outcomes.

Government agencies and programs

The primary stakeholder in research, according to respondents, is state government agencies. Often, several agencies are selected due to their legislative responsibilities and capacity to deliver NRM outcomes. Prominent state agencies in Coastal CRC research included those involved in

environmental regulation, the management of primary industries, natural resource and conservation and fisheries and parks. Particularly, agencies involved in the management of marine parks and fisheries are key stakeholders. One specific need for involvement of state agencies was based on the availability of expertise in the assessment and mapping of benthic (bottom of waterway) environments, such as habitat, fish and invertebrates.

The choice of agencies, in some cases, may depend on established multi-agency collaborative programs, such as for one project involving wetlands management. These programs have well-established research objectives, processes and networks that encompass a range of coastal and waterway management issues.

Local government agencies and their representative bodies are next most involved as key stakeholders. Coastal local government authorities are equipped with environmental managers and planners who are responsible for waterway management, including monitoring and water quality assessments. Local government's expertise in estuary management and intertidal zones is also perceived as advantageous for researchers. The involvement of local government in existing collaborative partnerships with other agencies may be another reason for their selection as stakeholders.

National agencies and organisations provide overarching policy direction and networks in coastal issues that benefit some researchers. The National Stakeholder Advisory Committee (NSAC), a stakeholder group established by the CRC, and the National Estuaries Network (NEN) provide strategic advice and facilitate collaboration with other researchers. A few relevant national agencies were involved in projects where their jurisdiction covers the management of marine parks and estuaries (e.g. Great Barrier Reef Marine Park Authority).

Regional NRM groups

Regional natural resource management bodies featured strongly as stakeholders. Their strengths lie mainly in having strong partnerships with state government agencies and research institutions. It is these high-level partnerships and their mandate to deliver regional NRM outcomes that are perceived by researchers as the greatest benefits of this collaboration.

To a lesser extent, the regional bodies are also a point of contact for 'grassroots' organisations such as WaterWatch and landcare groups. Consequently, regional bodies are perceived as a focal point for tapping into

local networks (e.g. WaterWatch groups that can provide specific data on water quality assessment).

Researchers

Interest in both individual researchers and research organisations by stakeholders is largely contingent on existing networks and the relevance of research programs. Other CRC partners and researchers are sought in preference to individuals or organisations that are disinterested in CRC activities. One reason for this would be because of previous work in regions that has been collated by CRC partners. This work can identify research priorities, networks and information that benefit other research projects. This commonality of research interests extends to seeking the involvement of organisations in existing collaborative working groups, such as for wetlands management. Their connection with other research projects was one potential mechanism for identifying stakeholders.

Spin-off benefits of research can become apparent in increasing the networks with other scientists. Researchers from one collaborative project noted that there was considerable interest from other scientists in their habitat mapping technology and information. This demonstrates the value of targeted 'promotion' of research results. Another project that targets their research outcomes uses a web portal to elicit interest from scientists as well as regional bodies, agencies and community groups.

Community groups

Despite having generally lower consideration as stakeholders, the diversity of community interest groups involved in research projects is wide-ranging. Local catchment associations and committees were a focus, mainly because of their vested interest in NRM issues. Environmental councils and groups, such as WaterWatch and Landcare, are beneficial for the sharing of data and information, and help with generating agreement and approval from the community of research in local areas.

'Coastal users' in general represent the range of people using coastal areas for recreational pursuits, and are acknowledged as stakeholders because of their desire for a healthy and productive coastal environment. Among this group are recreational fishers, surfers, holiday-makers, boating clubs and property owners.

Industry

Various industries are involved because they are land users who can have a
significant impact on the condition of coastal environments. Given the potential
impacts that shipping can have on the coast, port and harbour authorities were
the predominant industry-based stakeholder. Other general industries that
depend on water supply or their proximity to ports (e.g. oil and gas companies,
cement works and salt works) were also stakeholders. The fishing industry and
developers were also key stakeholders.

4.3   Who were actually engaged?

Researcher respondents were asked whom they actually engaged with. This
question was intended to find out who were actively being engaged and how this
differed from groups researchers defined as their stakeholders.

The specific stakeholders involved in projects reveals that multi-partner
collaborations are sought in preference to single-partner collaborations. It also
shows that there are varying roles for engaging different types of stakeholders.
Only two researchers of those surveyed did not engage other stakeholders. This
discussion reflects on the stakeholders engaged and some research project case
studies that demonstrate the extent of engagement. Stakeholder organisations
nominated in the participants' responses include:

- Defence Science and Technology Organisation (DSTO)
- Geoscience Australia
- Great Barrier Reef Marine Park Authority (GBRMPA)
- Fisheries Research and Development Corporation (FRDC)
- National Estuaries Network
- National Stakeholder Advisory Committee
- Australian Soil Science Society
- CSIRO
- Department of Natural Resources and Water (NRW)
- Department of Primary Industries and Fisheries (DPI&F)

- Human Dimensions in NRM group (HUMDIMNRM)
- Regional Groups Collective
- NRM SEQ Ltd
- SEQ Western Catchments Group
- Bulimba Creek Catchment Coordinating Committee
- Burnett–Mary Regional NRM Group
- Fitzroy Basin Association
- Far North Queensland NRM Ltd
- Keppel Bay stakeholders
- Port Curtis stakeholders
- Maroochy–Mooloolah Catchment Coordinating Association
- Maroochy community groups

- Environmental Protection Agency (EPA)
- Queensland Parks and Wildlife Service
- Department of Education and the Arts, Queensland
- Queensland Health
- National Action Plan for Salinity and Water Quality coordinators and working groups
- NSW Fisheries and Wildlife
- Parks Victoria
- Central Queensland University
- James Cook University
- Griffith University

- Mackay–Whitsunday NRM Group
- Sunshine Coast Environment Council
- Sunshine Coast community groups
- Glenelg Hopkins Catchment Management Authority (CMA), Victoria
- Gold Coast City Council
- Tweed Shire Council
- Noosa Council
- Byron Shire Council
- Livingstone Shire Council
- Fugro Survey Pty Ltd

State government

A range of state government agencies were engaged. Partnerships tended to be multi-agency collaborations rather than as individual agencies acting in isolation. Prominent partners for Queensland projects were the EPA, NRW and DPI&F. The Queensland Parks and Wildlife Service were one of the partners in a project. Parks Victoria and NSW Fisheries and Wildlife partnered as funding bodies for a project, while the Department of health and Education Queensland were similarly engaged. Coordinators of state programs (e.g. Rivercare) were also represented.

Local government

Local governments were engaged in some projects, and researchers collaborated with several councils on some projects. For example, one researcher involved the Noosa, Gold Coast, Tweed Heads and Byron Bay local governments and their planners in project activities.

National organisations

Several federal agencies were involved in projects. The CSIRO and Geoscience Australia were among several stakeholders who provided funding and developed scenarios to be tested by one project. The Defence Science and Technology Organisation (DSTO) were interested in security applications for a project around Sydney Harbour. The GBRMPA were stakeholders for two projects, which was effected through the Local Marine Advisory Committee. The CRC's National

Stakeholder Advisory Committee provided input, often at a more strategic level than the project level. NAPSWQ coordinators, both federal and state (e.g. Rivercare), were also noted as involved stakeholders.

Catchment management groups

Researchers see value in engaging several catchment groups based on different approaches to NRM. One project involved three catchment groups (Western Catchments, Far North Queensland, Glenelg Hopkins CMA) that differed in their structure: one was a statutory body, another had a statutory regional plan, and the third was a voluntary group. Other researchers engage with several groups where relevant to their research, such as the Bulimba Creek Catchment Coordinating Committee and the Regional Groups Collective that brings together the interests of all Queensland's regional bodies.

One researcher expressed concerns that some regional bodies are engaged in preference to others—especially the Fitzroy Basin Association (FBA)—because of their status as a preferred region in which pilot studies are undertaken. While this is understandable given Fitzroy's status as a Coastal CRC focus catchment, it may be a potential problem if other regional bodies are not also engaged, where the aim is to obtain wider community representation. Indeed, the FBA were stakeholders for seven of the twelve researchers who liaised with regional bodies.

Researchers

Scientific researchers from various organisations were engaged as one of several collaborative partners on projects. These included, in general, government agency staff (e.g. Fisheries Research and Development Corporation), universities (e.g. Griffith University, James Cook University) and CRC researchers (e.g. 'Science to enable the adaptive management for sustainability' or SEAS program). Government agency groups, such as HUMDIMNRM (Human Dimensions in Natural Resource Management), proved invaluable for some research.

Community groups

The more directly contributing community groups engaged were those that could provide information or data to supplement research; for example, groups in Maroochy such as Waterwatch and the Sunshine Coast Environment Council. There was also some interest in the assistance provided by recreational groups,

such as recreational fishers, divers, conservation and environmental organisations, a historical society and a local maritime college. Indigenous community representatives were also stakeholders at public meetings.

Industry

Some industry organisations demonstrated interest by providing funding for project outcomes they wanted. One organisation—Fugro Survey—took on a lead role in seabed mapping and classification, which added to their surveying expertise. Other industries were engaged in various capacities, such as commercial fishers; tourism; the water industry; port and harbour corporations; and cable, oil and gas companies. The roles of industry groups and organisations evidently varied from leading research projects to being only recipients of research results.

Techniques used for engaging those stakeholders

Workshops are generally used at various stages of research to seek partnerships in projects, provide feedback on research and inform about project results. Direct engagement of potential stakeholders through presentations has also proved effective. For example, regional bodies have adopted approaches espoused by research projects as a result of presentations. Other techniques to seek interest and inform about results include scientific publication and conference presentations (e.g. the Soil Science Society), and a television campaign (Healthy Waterways).

A researcher described how one project had directly addressed the question of how best to ensure accessibility to and availability of information to the community. This was done through community engagement activities and education programs, free summary information and a web page with visual graphics which were developed in conjunction with the Fisheries Research and Development Corporation (FRDC). This project drew on well-resourced communication activities to provide very timely information to coastal communities through a computer network.

Several CRC projects have developed 'toolkits' to facilitate the sharing and spread of research findings. Informing stakeholders through a range of communication techniques has led to the inception of other projects. The FRDC project resulted in another technical project to develop tools that benefit state government agencies.

Extent of engagement with stakeholders

Different stakeholders are given varying degrees of involvement in projects depending on their potential ability to contribute to achieving project outcomes. Organisations and people who can undertake scientific research and are in a decision-making position are engaged strongly. State government agencies and resource managers such as regional bodies are preferentially selected for their influence on undertaking research and in how results are communicated to society.

Community groups, industry organisations and the public, though, tend to be engaged primarily as 'end users' of project results. Often, public meetings and workshops are a forum to keep the public informed as to project progress and to disseminate findings from research. The community's role in influencing the direction of projects is usually limited, although there are a few examples of projects that specifically seek community-based decisions and consent. An FRDC project in the Recherché Archipelago, Western Australia, involved the community in deciding which areas to map. Another project liaised with landholders to gain permission to study sites on their properties; bird groups provided information on wetland species; and fishing groups that provided information about fish stocks in wetlands.

4.4   Disadvantaged groups

There was an interest in the degree to which disadvantaged groups were engaged as a way of telling the extent to which the CRC research was able to get 'out there' and access, and make itself accessible to, even the most inaccessible elements of society. Minority groups were involved to varying degrees in research projects. The involvement ranged from researchers who actively sought representation of these groups in research activities, to passive involvement where, for example, people attended workshops of their own volition. Figure 4.1 shows the range of stakeholder groups involved.

Groups represented among stakeholders
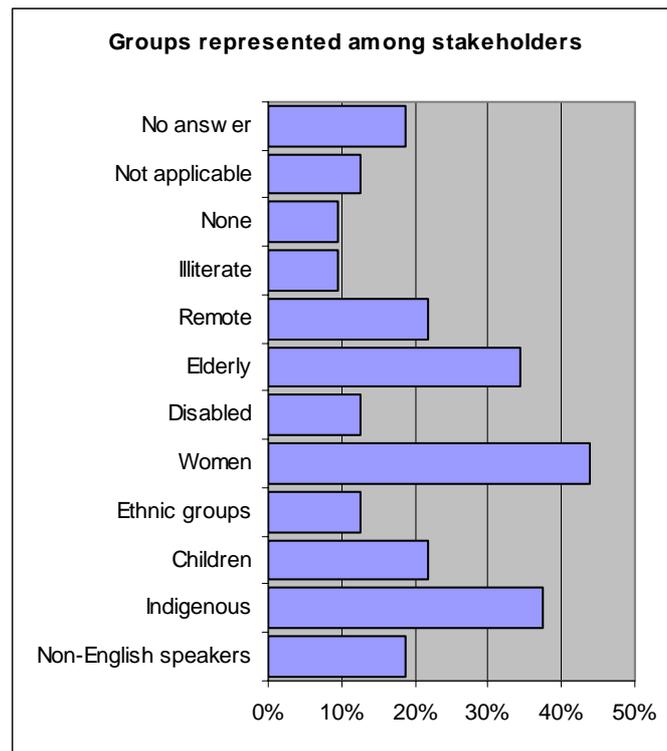
**Figure 4.1. Stakeholder representation of disadvantaged groups,
as identified by respondents**

Degree of involvement

The extent to which stakeholder groups were involved depended largely on
whether representation was essential for research. Some groups were
actively sought because of existing networks that were relevant to research
(e.g. Indigenous Facilitators Network). Other groups were represented only
because they had their own motivations to attend workshops or meetings.
That is, they were not actively sought by researchers.

If these groups were associated with existing stakeholders, then their
involvement was noted. General opportunities such as 'think tanks' and
workshops were provided for these groups to become involved. If they attended,
then they became recognised as stakeholders. The issue of whether researchers
specifically targeted groups becomes apparent in this discussion, and about
25 per cent of respondents noted this situation of 'passive involvement' of
groups. One researcher noted that their project focussed on working within the
existing institutional network and did not attempt to address the inequality of
involvement in the regional processes.

Indigenous

There is particularly strong interest to involve Indigenous groups in research. Indigenous representatives were actively sought for contributions to a chapter of a book, *Community, environment and history: Keppel Bay case studies.* Another representative was involved as an opening speaker. An FRDC project initially attempted Indigenous representation, but this was not successful. However, they will be seeking similar representation again for a larger project. Other projects have found that there needs to be sufficient time allocated to liaise with this group.

Women

Representation of women was noted, though in most cases they were not actively sought. There is a gender imbalance in some stakeholder groups, such as officials on boards where men comprise the majority of representatives. However, women are strongly involved in education programs, such as the North Keppel Environment Centre. Women are also prominent in lobby groups and as researchers in some areas. In one research project, it was noted that groundwater scientists were mostly men, while research into benthic metabolism involved mostly women. Many researchers felt that the gender balance in their research was good.

Elderly

Examples of active involvement of the elderly included a series of interviews and production of a video about the history of involvement with fishery. Another history-related project involved a 73-year-old woman as a co-researcher.

Ethnic groups

Specific ethnic groups, mostly related to international collaborative research, have been sought. Some South Sea Islanders worked on a project that related to colonisation. Another project had visiting Chinese scientists who looked at issues of before and after dam building, for a joint project on the Yangtze Delta. A review of a Norwegian research centre was another situation involving ethnic groups. One researcher mentioned that liaison with ethnic Australian groups was undertaken.

Remote area communities

Remote communities have been represented, though to a limited extent. These groups may be located in regional centres (e.g. Esperance), or in more remote areas where they could travel to regional centres for involvement on projects.

Children

In a few cases, children were targeted through education activities. These ranged from formal programs (e.g. Reef Guardian) to displays at fairs and schools. One project even involved a child doing a voice-over for a game (Aussie Osprey), which aimed to break down the nature/environmental/cultural divide.

Other disadvantaged groups

Disabled and illiterate groups were not explicitly targeted, though may have been present at public meetings. Illiterate people were represented through the involvement of Indigenous people. Non-English speakers were sought for one project and avoided for another.

4.5   Mechanisms for including stakeholders in research

Researchers were asked which methods they used to involve stakeholders. The range of methods used varies widely, from formal meetings, workshops and publications through to informal methods by email and telephone. These responses show that the mechanisms used depend on the purposes and need to include different stakeholders at different stages of projects. Table 4.2 summarises the types of mechanisms used for communication with stakeholders. These figures represent the methods spontaneously reported by researchers and do not necessarily indicate of the true extent to which different mechanisms were used. For example, it would be reasonable to assume that all researchers used email and telephone communication at various stages, even though the statistics don't reflect this.

Table 4.2. Mechanisms used for communicating with stakeholders

Mechanism	Percentage and number of respondents (*n=32*)
Meetings	66 *(21)*
Workshops	53 *(17)*
Email	38 *(12)*
Presentations and activities	28 *(9)*
Telephone	22 *(7)*
Interviews	22 *(7)*
Publications	22 *(7)*
Electronic media	9 *(3)*
Web sites	6 *(2)*
Conferences	6 *(2)*
Think tanks	3 *(1)*

Meetings

Regular formal meetings were the main means of communication with stakeholders. The frequency of meetings varied, with 'regular', quarterly or six-monthly meetings being predominant. Established vehicles for communication, such as the National Estuaries Network (NEN), were at fixed six-monthly intervals, whereas liaison between key partners, such as in the project start-up phase, occurred quarterly or even more frequently. Group meetings were the most common type with regard to the number of stakeholders involved. One project, though, largely used one-on-one liaison with stakeholders (with the Fitzroy Basin Association concerning preparation of the *Central Queensland information paper*).

In most cases, meetings were instigated by researchers as a part of project leadership. These were both formal meetings, and informal meetings such as at the supermarket or on the beach. Opportunities were also taken to observe at other stakeholders' meetings as a way of achieving engagement with interested and potential stakeholders. For example, observation of council meetings for Port Curtis, Brisbane City Council, Ipswich Council; and attendance at meetings of regional bodies and grassroots groups, as well as 'citizen senates' in south-east Queensland.

The nature of discussions was varied, and an overview of case studies shows that meeting topics ranged from issues that required decision-making, where stakeholders provided feedback on project direction, through to information sessions to advise on project progress and results. Specific projects communicated with stakeholders by:

- presenting information at NEN meetings

- gauging their needs and interests and the research applications they needed

- seeking feedback on draft products and acting as a sounding board

- seeking guidance in the general direction of the project with regards to the types of information to provide, NRM issues to address and how to present this information

- discussing the definition of a project and how the outputs might be useful

- holding a public meeting of about 80 people from regions and government to decide on what areas to map next.

Workshops

Technical advice and project direction was provided by occasional workshops with stakeholders. While generally less frequent than periodic meetings and organised on an 'as needs' basis, workshops attracted a wide range of stakeholder interests. Workshops were also highly effective in maintaining stakeholder interest. Local government representatives in one project were concerned about the lack of consultation over a plan, so a workshop was used to address and resolve any issues.

Some projects organised up to four workshops for consultation with various stakeholders. These included:

- The Monitoring and Evaluation Working Group (MEWG) held two workshops: one with experts for validation and one with regional body coordinators to demonstrate a concept and check its usefulness to them. This work was then applied to a new area, in Tasmania, where another (local) workshop was held.

- Scientists were regularly used in 'expert panels' for decision-making, and dissemination of results and information.

Opportunities were also taken to attend workshops organised by others through existing forums (e.g. National Estuaries Network, Coastal CRC annual retreat, community groups and government agencies). Workshops provided opportunities for input to the direction of projects (e.g. National Stakeholder Advisory Committee at macro level, for broad research direction across projects), determining stakeholder needs and format of project outputs (e.g. a wetlands project), periodic project reviews from users' perspectives, and presenting findings. Special interest topics were also covered by workshops, such as wetlands and contaminants workshops, which attracted considerable industry and government interest in Port Curtis and south-east Queensland.

Email

The use of email was apparent both for instigating contact with stakeholders and for regular liaison during the project. The vast majority of email contact was sporadic and between individuals. However, the establishment of email groups proved effective to notify stakeholders with information alerts, and to seek input to reports and project outputs. These included the HUMDIMNRM email group, and an e-distribution list of about 20–30 people to involve universities and landcare groups in a literature review.

Presentations and activities

Providing information through presentations was effective mostly to inform the community about project results and products, but also to advise stakeholders. Typical presentations were made at public open days, information sessions for schools and a history fair.

The need for using presentations to engage the community is best exemplified by an FRDC project in the Recherché Archipelago:

> *Empowering regions rather than centralised government departments comes out of the realisation that information produced at state level is not available to regional people and regional people react strongly to state decisions because of a lack of communication and information, and involvement in decisions. There is much isolation in communities, which probably contributes to a reaction against a central government telling them what to do. So, how do we communicate information so that [it is] accessible and available for everyone?* (Coastal CRC, unpublished internal project document)

One of the ways to communicate was to set up community engagement activities and education programs, with free hard-copy releases of summarised information.

Telephone

Communication and informal discussions between individual researchers was also frequently handled through telephone calls. Teleconferences were also used where remote stakeholders were unable to attend face-to-face meetings. Contact with potential stakeholders to involve them in projects was often initiated with phone calls.

Interviews

As a way of eliciting feedback on various aspects of projects, researchers carried out structured interviews of stakeholders. Both face-to-face interviews and survey were used. Some of the information gained through these included determining social indicators, establishing a benchmark of social characteristics and evaluation of a model.

Publications

A range of publications was used to present progress reports and results to the wider community. Material ranged from glossy brochures outlining project objectives, to articles in newsletters, newspapers, magazines and bulletins. Substantial publications like brochures were professionally produced and communicated (e.g. with input from a science journalist). Widespread media networking was apparent in the publications accessed: *Catchword*, *Oz Geonews*, CRC newsletter, Greening Australia publications and a coastal community newsletter.

Audiovisual media

The media were engaged to enable effective public communication. Examples included the Healthy Waterways television campaign, radio interviews, and the production of a video concerning demonstrations against high-rise buildings.

Web sites

Web sites were seen as an effective communication tool. For instance, the CRC web site has had many responses from Australia and overseas. The Recherché Archipelago project set up a web page with visually stimulating information about the project. This web site was developed in response to complaints from stakeholders that images (seen as essential to the information message) were too big to fit on regular computer screens. Plate 4.1 below illustrates the issue.
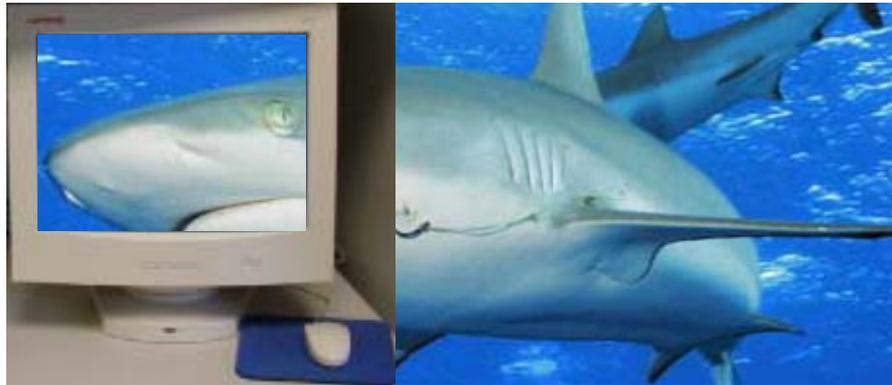
**Plate 4.1. The impetus for a Recherché Archipelago project web site
('images were too big to fit on regular computer screens')**

Conferences

Conferences were perceived as a legitimate forum for professional scientific communication. For example, the Dialogue and Knowledge Exchange project published at two major research symposiums (with wider audiences including other regional bodies), and made presentations at two international and several regional and national conferences.

Think tanks

Think tanks, while not widely used, were one way of involving stakeholders. One project used think tanks extensively and had five such sessions with various stakeholders.

4.6　Level of stakeholder responsibility in the research

Traditionally, researchers have retained control over the content and process of the research with the role of stakeholders as passive recipients of the resultant products. In the Coastal CRC, the wide range of responsibility that stakeholders assumed spanned from full control of research that was contracted out to the CRC through to the traditional role merely as recipients of information sessions. Specifically, responsibilities included the development of research proposals, project management, provision of funding, on-ground field research, provision of information and data, delivery of research outcomes and opportunities for general consultation and feedback. Table 4.3 summarises the broad responsibilities that stakeholders had in research.

Table 4.3. Responsibilities of stakeholders involved in Coastal CRC research

Responsibilities	Percentage and number of respondents (*n=32*)
General feedback	41 *(13)*
Project management	34 *(11)*
Information provision	31 *(10)*
Field research	25 *(8)*
Proposal development	22 *(7)*
Delivery of outcomes	22 *(7)*
Funding of research	16 *(5)*

Proposal development

Stakeholders had varying contributions to decision-making as a part of developing project proposals. At the broadest scale, they provided input to deciding on projects during the set up of Coastal CRC project rounds (first and fourth years of the CRC). Other general contributions were realised in the development of research proposals.

More specific contributions were apparent in the input that stakeholders had with each other's projects regarding methodology and areas of research so that the relevant areas were adequately addressed. Contributions also included industry partners and other stakeholders being responsible for selecting relevant study sites, identification of questions to be answered through research, and the development of scenarios for modelling (e.g. Fitzroy Basin Association). Members of one research team were able to provide input into the variables that could be measured and how measurement could be done. One assessment project was directed by stakeholders who specified locations for algal bloom and

seagrass research, as well as determining that sea grass density should be measured.

Project management

Once projects had been established, stakeholders were allocated responsibility for providing project management and sustaining impetus. As the 'gatekeepers' of projects, stakeholder representation on steering committees enabled overall direction to be maintained. Complex management processes were kept in check by specifying the stages in research to be taken. In one case, for instance, starting with a collaborative 'think tank', researchers produced a report and took it back to the regional body. Researchers asked stakeholders what should be done next, and the regional body then asked researchers what could be done to improve relationships with their stakeholders. This resulted in researchers suggesting a capacity audit.

'Buddy' groups set up within projects enabled regular meetings between stakeholders to take place, which helped to direct the research focus. In some situations, the theme leader had a role in coordination between subprojects and the project manager. Other notable projects where stakeholders provided direction were coastal lobby groups of South Sea Islanders who provided input over the long term, and research in the Recherché Archipelago, which was jointly managed with the community. A wetlands project engaged stakeholders from the beginning and they influenced project direction. There was ongoing engagement and an iterative process of consultation. This process culminated in a workshop that made recommendations to the minister to form a national coastal council comprised of coastal community representatives.

Funding

Provision of some research funding from stakeholders was specifically directed towards filling in knowledge gaps where additional research was required. The Keppel Bay NRM Group funded extra research for a project, and the Fitzroy Basin Association provided additional funding and scenarios for modelling in response to a project proposal.

Field research

At the operational level, the recognition of stakeholders directly involved in research covered both those employed as field researchers and those who gave permission to access study sites. Stakeholders involved at this level were not

responsible for project decision-making, as they largely carried out tasks that were allocated (e.g. research assistants). The variety of tasks for fieldwork included scoping of research issues, identifying barriers to research, and data collection. In a modelling project, south-east Queensland stakeholders had responsibility for finding ground-truth sites, but this was undertaken slowly because it was not core business for them.

Associated with the field research, and recognised as stakeholders, were landholders who either offered their properties as study sites or who granted permission for researchers to travel through their land to gain access to study sites.

Information provision

Stakeholders were called upon to provide information that would assist with setting research priorities (i.e. to develop proposals), supply data during the course of research, and contribute to data verification.

While stakeholders at this level were not directly involved in decision-making, the background information provided to project managers helped to set directions, such as determining study site locations. In a social research project, involvement was crucial to help develop models of stakeholders' relationships with their natural environment and to identify the ways in which they would be impacted by environmental changes.

The supply of data to researchers was a benefit of involving technical stakeholders. Historical data on fish catches was supplied for a project that involved a fishing group. Another project had equal partnership with stakeholders during a pilot study that could not have been done without the stakeholders' endorsement.

Verification of data was another aspect of information provision. Interest included: verifying models that were developed and advising on their accuracy; providing validation and assessment of the credibility and reliability of information acquired; and providing feedback on a literature review.

Delivery of outcomes

Assistance with the delivery of research products, identifying applications and promotion through publishing was enabled by engaging with specific stakeholders who provided input as to how delivery was undertaken and who were in a position to make this possible.

The outcomes of research included the delivery of products through training and information sessions. Stakeholders had direct input into how these products were developed (both at the start and end of projects) as well as how to ensure that the products were adopted by end-users. Project outcomes were useful to meet users' needs and were delivered in a timely manner. Besides delivering products, publishing research results was another strong type of outcome. The diversity of publications included a book chapter, professional journal papers, conference presentations, articles in the CRC newsletter and community newsletters and, for an estuary-mapping project, an article *Oz Geonews*. Another outcome was the fruition of follow-on consultancy work.

General feedback

Actively participating stakeholders without decision-making powers were involved at various stages of projects and were able to provide feedback. However, it was at the discretion of the CRC researchers as to whether these were considered to affect project outcomes; there was no obligation to accept this type of advice. Negotiation with some stakeholders, particularly Indigenous groups, occurred on the process of engagement as well as with some industry stakeholders on issues of confidentiality and representation.

More general engagement of the wider community (typically end users) was undertaken, with a range of interest groups and associated communication mechanisms represented. Community workshops aimed to elicit general feedback on research progress and results, with a six-monthly or annual interval between these meetings deemed appropriate. As consultative and participative sessions, these included schools and invited interest groups, such as local marine advisory committees. Consultation in some instances was achieved through the National Estuaries Network.

4.7   Involvement in different stages of the research

The typical stages of the research process (Figure 4.2 at right) were presented to the researchers and they were asked to identify the stakeholder engagement at each stage. Some thought about this quite carefully and listed who was involved and how. Others simply said they used the methods they had already described throughout. So it seemed possible that some of these researchers did not include all of these stages in their research. When this was noticed this, those researchers were asked if they had included all the stages and sometimes they had not. Therefore statistics may include some errors of commission from early interviews.

Problem identification

Data collection

Data analysis

Interpretation

Dissemination

Implementation

Evaluation
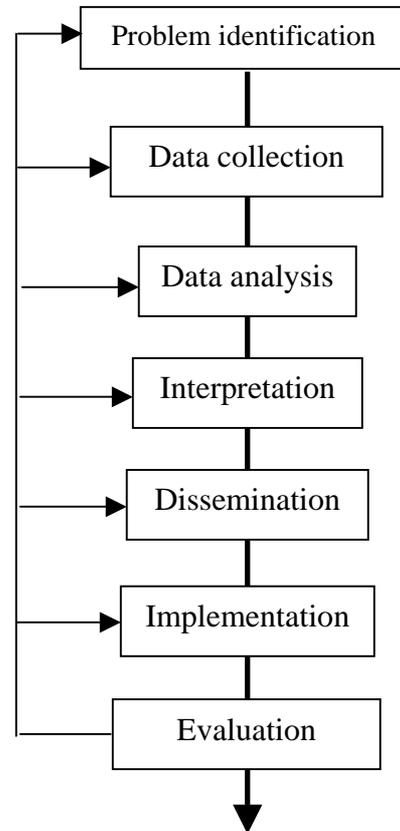
Figure 4.2. Typical stages of the research process

Overall processes

Some of the projects had consistent engagement techniques, such as meetings, workshops, reports or advisory groups that provided feedback throughout the whole research process. One project found this necessary to take historic and economic factors into account. Another had a PhD student living in the study area to help provide continuity of interaction. A new research project coming out of the CRC work is being set up in this way, with public consultation, public meetings, a steering committee, science advice and stakeholder committee that feed into the project planning team. This will enable it to include social and historical factors and to have communication strategies built into the process.

The level of stakeholder involvement differed among projects, and among different parts of the projects. There were challenges to involve stakeholders in some aspects due to differences in expertise.

Other projects had particular phases that involved stakeholders. For example, one highly technically driven project came out of opportunities provided by emerging technology and didn't involve stakeholders in problem identification. However, this was not a barrier to enthusiastic adoption and there was a high level of involvement from that point, on with continued collaboration planned into the future.

A more typical approach was to have highest levels of engagement at the start and the end of projects, with the bulk of the research carried out by research teams with more limited engagement. However, one researcher had no stakeholder involvement at all as he did not find any stakeholders with an interest in his work.

Problem identification

Problem identification (together with the dissemination phase) was the most popular stage to involve stakeholders. For many of the projects this engagement had happened prior to the start of the project, as several projects followed on from Round 1 projects. Other sources include the National Land and Water Resources Audit, the State of Port Curtis conference, non-CRC workshops and planning processes and PhD research. Another project was adopted by the CRC from universities and was initially technology driven, but became very stakeholder driven. Another approach was for researchers to identify the problems on the basis on their involvement in community groups on other projects.

For several of the projects, engagement was at a level higher than the project level. For some the problem was identified at a national level, perhaps involving the CRC's National Stakeholder Advisory Committee, or at a macro, societal level or involving workshops at a higher level of the projects than the researchers' involvement. Stakeholders helped define the focus of some of the research. The input was in terms of general direction rather than the details of project planning. They had input into goals, what the project would achieve and, to some extent, how to achieve these goals. Others prioritised what was important and what they required to come out of the projects or took part in general project planning.

Some researchers described their research as 'stakeholder driven', with stakeholders approaching them to provide products in certain areas, for example marine habitat mapping in Cape Byron and the Cockburn Sound, or wetland conceptual models. Another project was very open to what the research might tackle, and this was decided with stakeholders.

Who was involved?

Sometimes consultation was limited to local experts with coastal interests. Others had wider involvement, including local and state government, scientists and regional bodies. In some cases the problem came from the regional body. For others it was shaped by industry and the community (e.g. commercial and recreational fishing groups). This included joint workshops with the aquaculture industry and the local community. One researcher said the problem had initially been identified by the CRC itself.

Engagement methods

Some projects had high-level or extensive engagement at the problem-identification stage, especially at the start of the two rounds of the CRC. Some researchers concentrated on meeting with boards and CEOs at this stage. One project had a two-day meeting to identify the problem. Others used dialogue, workshops and questionnaires. For another project the research was like a consultancy, which involved delivering according to set terms of reference.

Potential problems

Some of the researchers had joined the project in a later phase due to staff turnover and were unclear about how the problem was identified. Others claimed that most of the research is researcher driven. At the other end of the spectrum, research could be a kind of service provision or consultancy, which raised issues of independence. One researcher objected to the term 'stakeholder' and claimed there had been none involved in the problem identification. Later, over coffee, when asked how he came to find his overseas case study, he acknowledged it was identified by his industry partners.

Data collection

There was variability across projects for the data collection component, with some only involving the research team and others involving stakeholders. In some cases the involvement was high, but only for a few individuals. Involvement was low for the majority of stakeholders.

One project involved all their stakeholders in data collection. Another particularly sought individuals to become involved and couldn't have managed without 20 active volunteers; ten of these were fishers who already collected data themselves. Other projects used local people to collect data. One had some involvement from a commercial partner. For most, it was state agencies and

regional bodies who got involved, with some involvement by the port authorities and the Regional Collective Group (RCG, for regional NRM bodies).

The processes included interviews, workshops, researcher meetings, presentations, public meetings and the hire of local boats. Collaboration worked through standard protocols and information was shared through regional body web sites.

Some stakeholders provided background and historical information and interpretation; for others it was ideas for case studies and contacts. Some were information providers only, whereas other projects sought their views; for example, which estuaries should be mapped. The stakeholders chose 160 out of 450 possible estuaries, within a set of agreed constraints. Picking study sites was one of the more popular methods for involving stakeholders in the data collection. Marine users provided boats and data. State agencies provided satellite imagery. For a social science project, the regional bodies carried out social capacity mapping, while the researchers did the rest of the data collection.

With non-professional researchers there is an issue with data quality, and some projects decided not to use the data they had been provided with for this reason. Others decided only to use data and not opinion as they felt it would affect the credibility of their research.

Data analysis

Most projects did not involve stakeholders much in the data analysis. Both the analysis and the interpretation was usually done by researchers, with stakeholders commenting and providing feedback rather than doing it themselves. One exception to this was projects that had external researchers as stakeholders. Another exception was social research, which could have heavy stakeholder involvement in the data analysis.

Interpretation

Social research also tended to have heavy stakeholder involvement in data interpretation and included boards and the RCG, though other research also involved stakeholders.

Stakeholders provided background and historical context, and Indigenous groups checked that the research reflected their perspectives. Commercial fishers and community provided information on caged tuna fishing. Stakeholders were involved in interpretation at wetlands workshops, which were a common tool for

enabling feedback and discussion. The CRC science coordinator assisted with getting feedback from the National Estuaries Network. Stakeholders were also included in developing a tool for interpretation of wetlands research.

Often interpretation was the exclusive domain of the researchers, with stakeholders limited to giving feedback or not being involved at all. As with the data analysis, an exception was cases that involved external research partners such as CSIRO, NSW and Victorian state agencies. Also, local experts were involved in some projects.

Dissemination

Together with problem identification, dissemination was the most common point at which to involve stakeholders. There was some confusion over what people meant by 'involvement' at this stage. Some people only regarded stakeholders as involved if they assisted with the dissemination process and so said that this was done by the team. This could account for only a little over 70% of projects involving stakeholders at this stage. For others the involvement was significant, while some projects were not yet at that stage.

The CRC had a strong role in dissemination though their web site, and at least one project relied on this method. Regional bodies also played a major role, in some cases doing the dissemination for a project. Their Regional Collective Group was also involved, as were the boards, the multi-agency Regional Coordination Group, the 'regional arrangements' projects and planning team and the Queensland Integrated Regional Information System network that used to be state agency-based and is now run by the regional bodies. See Appendix 6 for an explanation of these groups.

State agencies and councils were involved and Moreton Bay Partnerships (the partners involved in water quality in south-east Queensland). Other researchers were also frequently involved in dissemination. One project sought a local, university-based publisher for the work since there was an existing relationship, it had a strong local profile, and it was motivated to market locally what was essentially a local product.

Some projects involved all their stakeholders, including local communities and commercial interests. Some felt it was important for equity to provide the same information to all parties. One approach was to seek contacts for interested parties and send the report to all of them. This project had a list of a few hundred people. Others specifically targeted people who could use the information within communities and research organisations. Another target for dissemination was

schools, with both primary and high schools involved. Specific events were also targeted such as the 10th anniversary of Keppel Bay Environment Centre and the Queensland Environmental Expo for teachers.

A common dissemination method was through workshops or less formal groups. One project had a launch at an existing event of a stakeholder organisation. Others made use of academic conferences. For one project it was felt that a demonstration roadshow was necessary, while others tapped into the meetings of existing processes such as the Coastal Indicators Working Group, the National Estuaries Network or local marine advisory committees. Another strategy was to present to boards of interested bodies.

Stakeholders were involved by passing things through their networks, for example papers, reports, brochures or by word of mouth. The CRC was also involved by engaging a science writer, Ecoteam, which produced user-friendly materials. The CRC also assisted by having a centralised portal for their research through their web site, though researchers sometimes made information available through regional body web sites and sometimes stakeholder organisations wanted their own web site to host the material.

Some research regarded dissemination as part of the evaluation cycle that happened with the team and the stakeholders. Another approach was to involve stakeholders in testing products, which also has a dissemination component, or in the development of a pilot study with stakeholders, which became their dissemination process. Researchers also used target-setting workshops. One example from schools incorporated real-time data logging for interactive models into the curriculum as part of the project's dissemination process.

There were a variety of timing issues with dissemination. For one major stakeholder, the project didn't fit with their time scales so the project moved to another study area. Delays were also experienced because results needed to be approved by the CRC before dissemination and that happened late in the process. For others, the whole dissemination process, though really needed, was in jeopardy because of the need to finish before the end of the life of the CRC. Some research will only be partially presented as not everything was completed in time.

Some researchers stressed that information was to be disseminated to stakeholders, rather than involving them in the dissemination process. Another issue is that when research is disseminated to a particular group, they may have a specific interest in one part of the research, which needs to be distilled for them.

Implementation

In some projects stakeholders were dominant at this stage, with one researcher asserting that stakeholders usually do implementation. Some results were already operating on the ground, while others weren't at that stage yet, possibly through delays experienced with stakeholder timeframes. Some were even unsure yet how to use their research, with implementation sounding very tentative:

> *There may be management recommendations coming out of this project…if so, there may be implications… if so they [stakeholders] may be engaged.*

Regional bodies were often involved in implementation, including Fitzroy Basin Association, the Queensland Integrated Regional Information System (QIRIS) and catchment management authorities in Victoria, with interaction through board meetings, the RCG and their web sites. Grassroots groups have been less involved.

One project is going to be implemented through local governments, with others involving state agencies including the Water Resources Institute. Some implementation will happen at the federal level including the Commonwealth Environment Research Facilities hub, the Department of Environment and Heritage and consultants. Some overseas applications are happening through the web.

Others said implementation was not applicable to their research. In one case this was because elements of their research were still 'blue sky' ('pure' research with no immediately practical application), and will take another five years or more to be applicable. They gave the example of using acoustics to identify fish schools. Others also said it was too early for their project.

One project has produced a game that is being used in schools. Another will do a roadshow, if time permits. Others are focussing on policy change. Some researchers used workshops for implementation, or just implemented as part of the process of doing the research. Others had field testing or pilot studies. Stakeholders were also involved in determining who would use the products.

Products that are in use include the Port Curtis Integrated Monitoring Program, a wetlands map being used by the port authority, and pristine estuaries reference sites being used by estuary managers for monitoring modified estuaries and selection of sites for water quality monitoring. The EPA is developing policy to enforce the use of a hydrodynamic model in defined circumstances. Some

implementation has led to additional research starting up and users want to include products on their web sites.

Evaluation

Some researchers were unsure about whether their research included evaluation, said it wasn't currently planned or funded. One researcher was highly critical of evaluation, saying the results were unreliable. He gave an example where farmers were quoted as being very negative about something that he knew was well received.

For much of the research, evaluation was an ongoing part of the process throughout the life of the project, and was conducted with stakeholders and researchers, and as the research developed outputs at the end. Some described this process as 'extensive', especially the social research. This included providing feedback on the usefulness of results and the testing of products. For others, involvement was limited to reporting.

The evaluation process included the CRC, Land and Water Australia, state agencies, communities, commercial interests, regional bodies, experts, National Estuaries Network (NEN), the National Scientific Advisory Committee (NSAC) and Moreton Bay Partnerships. One researcher had this to say about their evaluation process:

> *All stakeholder groups had the opportunity to evaluate and comment on the models as true reflections of social impacts and relationships with waterways. Government stakeholders who had asked for methods for measuring social impacts were asked to evaluate findings.*

4.8   Intentionality of engagement

Organisations often run into problems achieving their goals because the people in those organisations often don't do what they say they do or what they think they do. In the baseline study of this project, this was assessed by looking at the difference between what was aspired to in terms of the need for the research and concrete milestones and deliverables that ensured that these aspirations would eventuate.

This was more difficult to assess on the basis of interviews at the end of the research projects. Researchers would need to be able to accurately recall their initial aspirations for stakeholder engagement. Since this seemed unfeasible,

this study takes a slightly different approach to the problem. It asks for the initial perceived need for the research and how researchers ensured the research would meet that need.

Issues

Some of the projects had trouble with this disagreement between theory and practice: there was a lack of ground-truthing or the work was researcher-focussed and did not ensure usefulness to stakeholders. Some of the researchers didn't know how this was addressed. They had come into the project part-way through and were just following the brief. Some seemed uncertain about what had happened ('I suggested that…', 'I believe that…'). For others, these intentions remained at the planning stage, having created "a wealth of new, relevant science and information but still much to be done to get this incorporated into informing improved planning and management". This places them in some doubt given the late timing in the process (four months after all project deadlines). Others ran into trouble with political or management agendas. Still other factors included difficulty of stakeholders articulating their needs and staff vacancies.

Methods

Of the majority that actively ensured usefulness with stakeholders, some projects relied on previous research, possibly from Round 1, existing common natural resource management actions, or linked in with other CRC projects. Some projects were stakeholder-driven, having proposals or the whole project developed with stakeholders. In these cases, researchers regarded the CRC's role as that of a service provider. Others worked in joint ventures as partners with stakeholders. One approach was to negotiate the project tasks and deliverables with stakeholders. Others were in continuous dialogue: genuine interaction which started with researchers being asked to tell what they could do and grew in sophistication over time, both technologically and in stakeholder capacity.

Others kept stakeholders up to date with email lists and workshops to ensure their work was useful and complimentary and regarded commitment to taking up research as evidence that usefulness had been ensured. Many made use of the CRC's annual retreat. Another approach was to build this into the monitoring process and include specific questions about usefulness and applicability when engaging stakeholders. One researcher presented their concept at a National

Estuary Network meeting, which led to new locations becoming involved in the research.

Who was engaged?

Some projects cast the net wide to include a range of 'possible' stakeholders or informally based their contact on existing networks. For some this included Indigenous stakeholders and local people. Others set up project reference groups. Another approach tended to concentrate at higher levels of decision-making with boards, CEOs, state agency managers, NSAC, NEN and other organisational leaders. For one project the enthusiasm of the CRC's regional coordinator was instrumental in facilitating interaction with a number of stakeholders.

End users were commonly involved, including state agencies, regional planners, universities, the Department of Environment and Heritage, local government and Moreton Bay Partnerships. Where the research was highly technical, sometimes it was the technical people who would take the lead.

Timing

Most projects had ongoing feedback processes throughout their projects, though for some this contact was during the planning and product design phases. For others, contact timing was more specific. Approaches included negotiations at the start of the round, 6-monthly meetings, responding to stakeholder requests during implementation, and evaluation phases involving stakeholders and 2-, 5- and 6-year reviews with stakeholders in addition to continuous dialogue.

4.9   Inclusion of different types of knowledge

Working with a wide diversity of stakeholders, researchers were challenged with finding ways to incorporate into their research the variety of ways of understanding the world that stakeholders hold. But there were some real benefits to finding ways of achieving this.

Why incorporate non-researcher knowledge?

Researchers found incorporating other types of knowledge added other dimensions to their study, making the research more interesting and meaningful and giving it a broader perspective. Local knowledge provided a greater

understanding of the environment and was a good source of background information.

Some types of project needed this non-expert input to do the study. Researchers identified a number of benefits of including these non-research-based ways of knowing. They found it useful in getting started, when there wasn't yet much other information to go on. They could check out the relevance of their work for areas other than their study areas, and find out how much of the state was like the areas they were studying. They could also get a historical perspective, finding out what has changed and what has stayed the same. For example, Indigenous knowledge provided very useful information about spatial and temporal change in shellfish and fish. This interest may become a new joint research area with the Indigenous community.

Researchers found that, where there was relevant knowledge to be incorporated, it was important to include these kinds of information in order to improve the science and make it more relevant to people. It also saved money, meaning that less field testing was required. This knowledge integration tended to be particularly relevant to applied research, with inclusion for pure research less obviously beneficial.

Sources of information

Anecdotal information was useful, particularly for specific events such as flood height and water movement, which could be incorporated into calculations. Local knowledge helped explain how systems worked, but it didn't take long before the researchers knew more than most locals. Professional fishers were the exception, with trawler, purse line and abalone fishers all seeing the ocean bottom differently.

Traditional owners, professional and recreational fishers and local communities around study areas have all provided input, some with a wide spectrum of interests. Researchers also received many communications about their research, which provided a wide diversity of knowledge and viewpoints. The postgraduate students on the projects enabled them to get a younger perspective. State government agencies also provided a diversity of approaches and information bases, which were some of the best integrated within the research.

Researchers discovered that Indigenous classification of marine habitats was done by fish catch and got information from people who ran boats in tidal areas with big sandbanks. Local information on site locations was useful and there was potential to use data collected by locals, for example, rainfall data.

Some researchers regarded knowledge from other disciplines, for example social science and economics, to be other knowledge systems, while some projects dealt only with biophysical scientific information.

How to integrate across knowledge systems

Firstly, researchers found that it was important to think about who else might have knowledge to contribute. Some took the approach of getting all the possible input and being open to all types of knowledge, whereas others sought the stakeholders most relevant to their interest area. One approach was to attend the meetings of community groups, and research students on the team extended the network to their peers. To access local knowledge, a key strategy was to engage local researchers. In the end, the diversity of knowledge needs to be distilled to a coherent overall position, which is inevitably the author's own explanation of their comprehension of the collected information.

Processes

The most common approach to integrating the incoming information was the use of social processes. It was critical to provide sufficient time and opportunities for the differences to immerge. Even reticent sectors were eventually willing to share information. Also, with persistence, initially resistant industry stakeholders could be drawn in by repeatedly asking, 'Why?' to challenge or clarify established beliefs. Researchers would almost always eventually put more time into the process than they had initially anticipated.

One approach was to allow discussions among the stakeholders to resolve the perspectives to be included. This could be developed further, with stakeholders supporting each other in the development of information-sharing resources, such as web sites. There is also a need for an iterative process between the researchers and the other stakeholders, where perspectives are shared and increasingly integrated with each iteration. These processes included the projects' own 'buddies' and also wider stakeholder and community groups. Additionally, direct interaction between the researchers and the stakeholders was important in developing relationships and facilitating these processes.

Another approach used by a number of projects to bring all the information together was a technique from social science called 'grounded theory'. This method involves recording the information provided from all the different sources and compiling it into a cohesive picture of what occurred by bringing related information together from the different sources until you have a fairly complete

and structured description of the situation. This requires checking mechanisms, since it would be easy for misinformation to prevent an accurate picture emerging. One such mechanism researchers used is called triangulation, where multiple types of sources are used to corroborate information before it is relied upon. For example, if interviewees describe a particular event or location it would also be checked from written records, photographs, or with different types of informant. One project checked information from community-based informants with state government agencies to check for accuracy. Grounded theory was also the approach used in the current evaluation study.

A related approach was the use of stories. This was a particularly favoured way of working with Indigenous people, but anecdotes from many sources could find their way into even heavily science-based calculations. So the stories were translated into 'science' and then the science back into stories through these interactions.

Part of the process was to convert such snippets of information into useful forms, for example, memories that a river didn't used to be muddy into pictures of environmental change. A highly visual project which produces images of marine floors found a good fit with local knowledge.

Plate 4.2. Sample mud map produced during a community meeting

Tools

Another popular approach was the use of maps, which can be created from scratch with knowledgeable locals, such as fishers, over a beer or two. Here the use of technology can help facilitate the communication, for example, each of the different views becoming data layers so that each perspective can be visualised by all. This strategy is a technological integration of science and non-science, rather than integration of other knowledge into the science.

A number of other tools were also used for knowledge integration. Firstly, the different forms of knowledge need to be identified. These need clear means of presentation that are targeted for their intended audience. Sometimes these were intended to persuade sceptics of their perspective. They may be historical materials illustrating that events have happened in the past. They may also incorporate information from a variety of disciplines.

The resulting materials were integrated using various forms of communication. These included email discussion forums, think tanks, fact sheets that list other sources of knowledge, reports, software and providing contact information. Web sites and online databases that allow locals to enter information were also used as inclusive ways of bringing information together. This could then be mapped to local data sets and displayed. Such visualisation can be important for knowledge sharing and was a common feature where research results can be displayed back to stakeholders for checking. For example, this was a useful approach in marine habitat mapping.

Another approach was to incorporate information into a model (see Plate 4.3). As new information comes in the model is adapted. For this to work the model has to be empirically based rather than a theoretical model. Information can also be included in literature reviews or as part of reports.
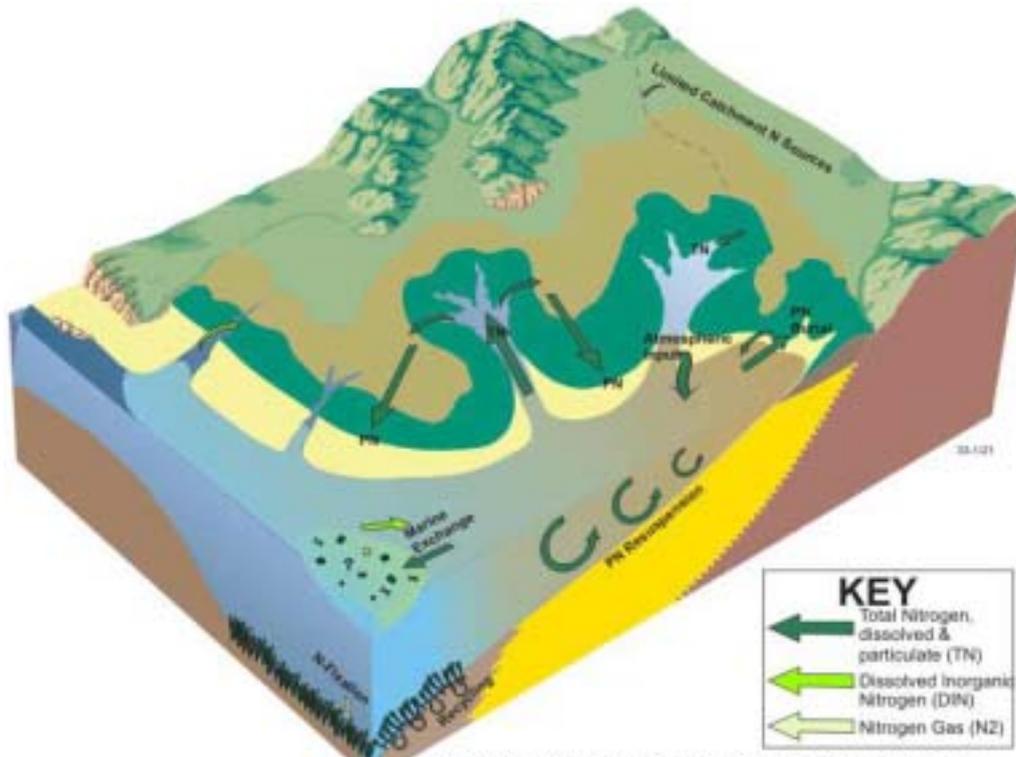
Plate 4.3. 3-D visualisation of environmental processes and systems in a catchment model

Unincorporated knowledge

Sometimes integrating non-researcher knowledge was inappropriate or too difficult. Pure research may not have obvious stakeholders, or it may be very difficult for stakeholders to be meaningfully engaged as the research is highly technical or mathematical. In such cases, sometimes the only contact was through the media.

In some instances researchers felt it would be inappropriate to their research and didn't try to include outside knowledge. For example, within a strict scientific framework, the burden of evidence may be too high for community-based information. One researcher commented that such information is highly subjective and needs validation, which they did by going back to the archives from the 1800s, or using old photos. Some decided not to use most of the information and just use what can be readily incorporated, for example, in aiding the informed selection of sites.

There were three other reasons given for not including external knowledge. One was lack of access to people who might have that knowledge or stakeholders offering no information. One example of this was a study that included Indigenous knowledge in the original case study area in Rockhampton, but then expanded to new study areas and was unable to find traditional owners to

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include in the new areas. A second difficulty was capturing that knowledge in a way that could be incorporated into the research. The third reason cited was the difficulty researchers had in comprehending very different ways of knowing. Information they could not understand was not incorporated into the research. One researcher found the whole concept difficult to comprehend, and too ambiguous.

Challenges to integrating diverse knowledge

Researchers faced a number of challenges in this process. The number one problem is the time it takes to do it well, balancing this with the demands of the rest of the research and the requirements to meet the deadlines of the funding bodies. Some felt that it was simply too time-consuming to be feasible within the constraints of the project. Another issue was the risks stakeholders perceived in sharing information. One risk was loss of 'commercial in confidence' information that they regard as their intellectual property. This view was expressed by external stakeholders and research partners. Another risk was the implied commitment to the information they were sharing: its accuracy and the implication that actions would be followed through. It was felt this had implications for their future control over their operations and finances. One researcher felt that such integrated research was disadvantageous as a career move, since most of the well recognised journals favour more discipline-oriented research, thereby reducing their publishing opportunities.

Another problem was the potential for a clash of views between researchers and stakeholders. For example, researchers may feel informants are exaggerating. Another example is the potential to cause offence in the interpretation of people's stories. For instance, one community project to build a wharf that didn't reach the water was written up humorously by a researcher who was then the object of anger by those for whom this had been an important project.

Another problem was when researchers had solid, objective evidence that a serious problem exists that needs to be addressed, but nobody wants to know. For example, in researching beach erosion, there was a tendency for nobody to believe there was a problem until the erosion was already visible. To the researcher it almost seemed that "when people put their feet in the sand, their brains switch off" (Plate 4.4).

Plate 4.4. Beach erosion? What beach erosion?

What's needed for knowledge integration?

One factor that really helps with being able to work together across knowledge systems is experience: it gets easier with practice. It also helps to think it through carefully in advance to ensure close alignment of the concepts involved. This will include ensuring that stakeholders are engaged whose interests closely align with the research in question. The closer the alignment, the easier it is to integrate the information. Information from related disciplines (i.e. sciences) is easier to integrate than unrelated disciplines. It is more challenging with knowledge that comes from quite different perspectives.

Another factor that would help would be to have a dedicated, local person on the team, preferably a social scientist, so that the considerable time involved doesn't detract from the time available to the rest of the research. Once stakeholders have been invited on board researchers need to spend the time necessary to really include them. This can even take days at every meeting, particularly with Aboriginal elders.

4.10   Flexibility

Genuine engagement with stakeholders requires flexibility to adapt to their changing needs as the project progresses. Researchers were asked how their research was able to adapt to stakeholder needs. The responses show the degree of flexibility taken by researchers, and some constraints to adaptability. The changes that researchers were able to make can be discussed in terms of the rationalisation of engagement processes, rationalisation of project structure and co-location with stakeholders. Table 4.4 summarises the broad types of adaptation undertaken.

Table 4.4. Types of adaptation employed or needed to engage with stakeholders

Type of adaptation	Percentage and number of respondents (*n=32*)
Degree of flexibility	
– Were more flexible	76 *(24)*
– No need to adapt; already flexible	9 *(3)*
– Were constraints to flexibility	9 *(3)*
– Not relevant	6 *(2)*
Rationalisation of engagement processes	38 *(12)*
Rationalisation of project structure	25 *(8)*
Co-location with stakeholders	25 *(8)*

Degree of flexibility

General comments about adaptability reveal that most researchers were flexible enough to accommodate stakeholders' needs as much as possible. Adaptability ranged from very flexible where there were no impediments; through partially flexible where some aspects could be adapted and others could not; through to inflexible because of time and resource constraints. Some difficulties in being able to adapt could be attributed to milestone reporting requirements, for example, as cited in the Knowledge integration and exchange project.

Rationalisation of engagement processes

Some changes were needed to the processes of how stakeholders were engaged, with the main issues being how new stakeholders were integrated, the communication methods used for engagement and the number of meetings required for effective engagement.

New stakeholders were able to be integrated with minimal disruption to project objectives. For the most part, it was a matter of being open to changes in taking

on new stakeholders and accommodating their requirements. Recognition and acknowledgment of the needs of stakeholders to have input to the engagement process was crucial in achieving integration. The importance of new stakeholders is reflected in researchers' realisation of needing to be flexible and in undertaking negotiations with them at the start of the process. Stakeholders were able to come in on projects when they were interested, and there were proxies who stood in for stakeholders who could not always attend regular meetings. A project that was initially nationally oriented changed focus to then incorporate local stakeholders in Port Curtis. The project aims remained fixed, but the methods of engagement were flexible, in part through additional resourcing or workshops.

Communication methods were also changed to fit in with stakeholders. Where existing formal 'steering committee' arrangements were not going to be effective in accommodating the engagement of interest groups, even though this arrangement was desirable, there was still a change to more informal meetings and contact. The buddy system, where there needed to be more intense involvement in local processes, was perceived as inadequate in one case. A desire to have less 'hands-on' involvement meant a greater focus on email lists for communication. This withdrawal from intense involvement worked well for the Port Curtis Integrated Management Plan, where ownership of the project by the local community was necessary.

There was considerable flexibility for fitting in with stakeholders' workshops and meetings. Indeed, this was the preference. Additional workshops were scheduled by researchers to provide opportunities for community groups to have input.

Rationalisation of project structure

Adaptability to involve stakeholders also meant making more significant changes to the structure of projects so as to fit in with stakeholders' needs. Constant adaptation throughout the life of projects was apparent, where the ability to incorporate stakeholders was built into project design. Action research cycles (observe–reflect–plan–act) were used, so adaptation during the project was made easier.

Projects were able to respond not only to new stakeholders, but also to new funding opportunities and new study areas. Budgetary constraints also necessitated changes in cutting back on project objectives. Renegotiation of project milestones in these cases was generally relatively easy.

One project was established on the basis of the 'hard to tackle' concept of integration, and it took a long time to narrow down the focus to something achievable. While being adaptable, another project suffered a setback when their project leader left.

Co-location with stakeholders

Being in the same place as stakeholders was a motivation for researchers. While there were changes to the sites involved in projects, there was also strong evidence of wanting to meet with stakeholders in their own area, and opportunities were provided for this. This varied from meetings on landholders' properties (e.g. Kilcoy, Logan and Maroochy) to participating in meetings in regional centres (e.g. GBRMPA's local marine advisory committee process). Benefits included a greater understanding of issues from a local perspective, which satisfies the need to develop a rapport with stakeholders.

4.11   Cost–benefit equity

There are cost implications of environmental research. Someone has to pay for the impacts of implementation and someone benefits from it. These are often different sectors of society. For example, benefits may accrue to the broader community with the costs sometimes worn by private individuals. Table 4.5 shows who the researchers anticipated would benefit from and pay the price for the implementation of their research.

Table 4.5. Beneficiaries and cost-bearers of coastal research findings, as seen by respondents

Sector	Benefits	Costs
Regional bodies/catchment managers	17	6
State agencies	12	9
Community	11	0
Natural resource managers	11	0
Academic community	9	3
Local government	6	3
Everyone with NRM interest	5	0
Industry	3	2
EPA	3	1
Infrastructure/property owners/ developers	3	1
Land managers	2	3
Environmental educators	2	0
Federal government	2	0
Marine park managers	1	2
Grassroots groups	1	1
Planners	1	1
Recreational fishing groups	1	1
The environment	1	1
Urban people	1	1
Coastal users	1	0
Consultants	1	0
Defence	1	0
Insurance	1	0
Local government association	1	0
Port authorities	1	0
School children	1	0
No one	0	9
Case-by-case basis	0	4

4.12   Enabling factors

The various factors that enabled researchers to carry out stakeholder engagement centred on specific institutional capabilities and a range of issues related to research relevance, communication, networking, resourcing, professionalism, management approaches and research applicability.

CRC structure

The CRC was perceived as being well connected—having a strong network—and of delivering good science. This made for a good model to engage stakeholders outside existing networks. The general networks of people, and their willingness to participate, were also features of the CRC that promoted engagement. Stakeholders received particular support from CRC researchers and the National Estuaries Network. The tendency of institutions not to interact was overcome by the CRC's approach to assist people.

In addition to existing networks and good institutional structures within the CRC, there was clear support from higher levels of management. Within this structure, information about who the stakeholders were was readily available to researchers. Having a history of active engagement, there was willingness by stakeholders to participate, and a high level of trust. The CRC's view of the importance of engagement was reflected in the exceptional support provided. Engagement was seen as having been done 'remarkably well.

Regional bodies

Engagement was also achieved through regional bodies and catchment groups. These groups acted as gatekeepers, and researchers were able to seek input from regions to their research.

Previous relationships and linkages

Stakeholders' existing relationships and networks with CRC researchers and other organisations considerably facilitated engagement. Previous personal relationships with groups and individuals (e.g. from environmental advocacy work) meant there was already a high level of trust and credibility with these relationships. Relationships with key people and familiarity with other players made it easy to build relationships. Good networks and linkages established in Phase 1 helped, but in some instances this was still a challenge.

With these existing networks came existing forums, such as regular meetings, which could be exploited to progress research. Researchers' existing positions on committees proved beneficial and enabled wider engagement of stakeholders. In one case, these included the Consortium for Integrated Resource Management (CIRM), the Reef Scientific Advisory Group, the International Water Centre and the Moreton Bay Partnerships Scientific Advisory Group. With wetlands research, there was advantage in a key researcher being split between the CRC and the Environmental Protection Agency, as he explicitly regarded his role as a linkage between the two groups.

The continuation of previous research was another factor that contributed to engagement. A significant amount of research followed on from Round 1, as well as from other research projects (e.g. research funded by the Australian Research Council).

Appeal and relevance to stakeholders

Research that was of interest to stakeholders was clearly a significant factor in achieving engagement. The relevance to and alignment of research with stakeholders' needs was one reason for strong engagement. Stakeholders expressed interest by approaching the CRC to request involvement in projects, and maintained continuous involvement throughout the duration of projects.

Having good tools to offer was another encouragement to engagement. Research outcomes that were directly applicable as solutions helped to keep up interest. Being able to give research results to stakeholders also helped to maintain interest; they didn't want to hear "we're still collecting data" or "we're going to do this". There was an overall appreciation of and enthusiasm for academic research on the part of stakeholders.

Building relationships

Relationships need to be continually nurtured with stakeholders, and it was recognised that this can take years to effect, so that stakeholders understand what is achievable through research. It is not possible to 'go in cold' and expect to achieve effective relationships unless they have already been built up over time. Good relationships are only possible with regular contact. In the preparation of the *Central Queensland information paper*, relationships were built through a consultancy and business partnership.

Communication

Communicating and interacting with people was demonstrated by informal phone and email contact as well as through formal face-to-face meetings. There was value in having a dedicated person on teams, for one project a full-time position, who could handle outward communication. A communications person could organise meetings, whereas the researchers would provide quality control of information that was communicated.

Where institutions tended not to interact with each other, the CRC fostered communication to overcome this barrier. One subproject coordinator had a good model that he employs in all his projects, which maximises communication and interaction between researchers. People skills could also be key; for example, a project in Gladstone had a great communications person as project co-researcher.

Networking opportunities

Engagement of stakeholders was sought through networking opportunities. Existing forums for networking were used, including other stakeholders' workshops, meetings and events. Networking was also apparent in the informal interactions at seminars and community events. For instance, a chance meeting occurred at an event with the Tweed mayor, who expressed keen support for the work proposed.

Organised meetings with stakeholders were also a means of engagement. This was used in some instances as the principal method for engagement.

Workshops

Workshops were perceived as significant in engagement. Through a regional coordinator, the CRC organised stakeholder workshops and stipulated (by setting into milestone requirements) that researchers attend workshops. In terms of the diversity of topics discussed and the greater opportunities for personal interaction, workshops were seen as more interesting than conferences. There was greater breadth and perspectives of information presented, some workshops included children giving presentations and, because information had to be pitched at a reasonably basic level, there wasn't much energy required to follow presentations. Setting aside part of the research budget was seen by a researcher as important to fund attendance at workshops.

Resources

Resources provided by stakeholders included funding, equipment, technology, written material and their time, effort and information.

Funding was particularly provided for attendance at workshops and meetings, such as payment of airfares. For example, Geoscience Australia, a research partner, provided extra funding to go to meetings. The Monitoring and Evaluation Working Group ensured that they had funding for workshops built into project budgets. A similar situation was apparent for a project, where it was ensured that budgets accommodated funding for workshops.

Equipment was provided in the way of vehicles for travelling to meetings, tables for display booths, graphics technology and computers for presentations. Communication technology included the use of phones and computer equipment for emails and Internet access. Written material was also provided or lent (e.g. from Livingstone Shire).

Reputation

People's personal reputation was considered important in establishing research credibility. There was a perception that the CRC, as a research group, already had a reputation as producers who delivered on time and to budget, and produced useful products.

Commitment, goodwill and support

A highly professional approach to engaging stakeholders was evident in most stakeholders' firm commitment to research. There was also goodwill on the part of researchers who wanted to become involved and attend meetings. At the national level, there was the support of the National Stakeholder Advisory Committee. Generally, all partners showed motivation towards project work. The CRC and its partners (e.g. Geoscience Australia, National Estuaries Network) were noted to be very supportive of projects through the provision of resources, and managers were able to give help where it was needed.

Perseverance

The CRC's persistence in achieving engagement was notable—they kept 'chipping away' to achieve partnerships and results. For example, there were persistent efforts by a local CRC coordinator to engage with the Fitzroy Basin

Association, as the researchers were located in Canberra and Hobart while their project was in Rockhampton.

A realisation that research needs to be developed properly over time was important. Having the patience to allow projects to develop to fruition over sometimes lengthy periods was a hallmark of established relationships.

Expertise/experience

People's skills and experience in various aspects of research were important to achieve outcomes.

In the early stages of projects, facilitation skills and researchers' experience in interacting with user groups enabled strong engagement with stakeholders. Having access to people with a good understanding of the politics involved was also beneficial in getting research done.

From the perspective of end users, where project results were to be communicated, there was recognition of a high standard of science writing, journalism and design within the CRC.

The key people were those who could provide help when and where needed. This included the 'right people' and organisations with expertise in particular areas, the right connections and the ability to support projects, as well as managers who could help when required. One researcher received surprising credibility simply by 'fitting' people's image of a 'typical scientist' with his Russian accent (Plate 4.5).

Plate 4.5. The 'typical' scientist

Good planning and organisation

Engagement was supported with good planning and organisation of projects. Research needs were identified through planning (e.g. marine park planning), and sufficient resources and time were built into milestones and budgets to accommodate engagement.

Attitude and enthusiasm

The success of stakeholder engagement was due in part to professional attitude and having enthusiasm for research. The willingness of stakeholders to become involved was coupled with the willingness of researchers to engage and serve stakeholders' needs. Considerable self-motivation was apparent in researchers' desires to push the involvement of stakeholders and in targeting specific information. Realisation that stakeholder engagement was critical for the success of projects also helped as a motivational factor.

Access to useful organisations

The value of networks proved advantageous for gaining access to relevant organisations. The National Estuaries Network was a linchpin in helping stakeholders to find the right people and organisations, and an Indigenous organisation was available specifically to act as facilitators to engage with the Indigenous community.

Politics

Being able to understand and deal with the politics of the various players involved was a factor that influenced engagement. Various aspects of politics were experienced in the course of projects, with power play a particular issue in local government. Personal politics between individuals or organisations was also a challenge, and having the skills and experience to deal with this was advantageous. Depending on the news of the day, research could be a hot topic politically—and be swamped with media and international interest—or it could be ignored due to lack of political interest.

Flexibility

It was important to have the ability to be flexible, particularly when dealing with different stakeholder groups who had particular needs in the engagement process. Applying the plan–act–reflect cycles of adaptive management (Figure 4.3) to research proposals was obvious evidence of this flexibility.
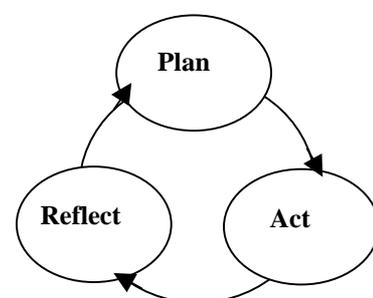
Figure 4.3. The adaptive management cycle

Implementation

There was a conviction that the implementation and take-up of projects by stakeholders was the only way that research would work. Emphasising the application of research outcomes and deliverables, and the potential for commercialisation, were motivating factors that ensured the involvement of stakeholders. Using well-developed science to develop usable products was a key driver of another project. A benthic habitat mapping project achieved genuine breakthroughs in research and had major outcomes with an automated process that was a combination of hydro-acoustic underwater video, satellite imaging and aerial photography.

4.13   Engagement constraints

Difficulties experienced by researchers included issues of time constraints, geographic location, interest and relationships of stakeholders, staffing, project resourcing and politics.

Time constraints

The limitations on researchers' and stakeholders' time were a considerable constraint to effective engagement. This was apparent in the wider context of rolling out and delivering on projects, as well as in maintaining personal contact with stakeholders.

Approval and establishment of projects took considerable time—up to one year—that left little time to undertake the proposed research. Stakeholders (e.g. regional bodies) also took time to reach agreement on projects. These issues contributed to some researchers being rushed to be able to complete projects on time and deliver on all outcomes. Some researchers felt that it would be a 'miracle' to get work completed on time, particularly as it takes a long time to roll out good research.

One researcher's time was limited in Round 1 because of involvement across a number of projects, which meant considerable report writing that took time away from other work. Time spent selling research projects to stakeholders was also limiting. A lack of understanding of the project planning process by researchers was another difficulty that hindered effective research, as was the time spent in changing and developing new project milestones (to expand into a new area). The impending closure of the CRC meant that effective delivery of

some elements of the program would be lost. Researchers in this situation (with, for example, only one year to do the research) felt that there was not enough time, particularly to fit in with the political agenda.

Engaging stakeholders took a long time, particularly when their input was sought and they were busy; stakeholders might have seen engagement as a lower priority. There were certain requirements of some stakeholders where their representative needed approval from senior managers to participate in the research on behalf of their organisation (government or industry). This was very time-consuming.

Needing to meet stakeholders face-to-face in regional centres and remote areas was a major time constraint. Where meetings necessitated overnight travel, for example, researchers' interaction was limited to fleeting visits. When organising time for interviews, particularly in more remote areas, it was not always possible to g *et al*l stakeholders involved when visiting a region or town. Consequently, researchers ran out of time to engage with everyone who was interested. In another case, workshops were organised at the last minute, which meant there was a lack of people attending and the community didn't feel very connected to it—they viewed it as just another meeting.

Geographic location

Projects that had a national focus found it difficult to effectively engage stakeholders, as it is was difficult to identify appropriate stakeholders and communicate with them across large distances. Researchers within a project who were spread out physically believed that made it more difficult to communicate effectively and maintain cohesion. For south-east Queensland, projects were spread out and not linked so they were treated separately. In some projects there was conflict over the desirable size of research groups, and whether they should be local or Australia-wide.

Meetings with stakeholders were made more difficult because of the distances involved in travelling and their physical location. Interstate travel was frequently required, and researchers noted that visits often had to be very short due to time constraints. Research sites were 'far flung', even across states within the same project (e.g. the Environmental planning for NRM project involved partnerships with regional bodies in far north Queensland, south-east Queensland and Victoria). In another project, where sites were spread from the Gold Coast to Gladstone, frequent travel was required between Sydney and Gladstone.

Because of the remoteness of some locations, relationships with stakeholders were often reduced to being based on emails and phone calls.

Stakeholder motivation and involvement

The level of stakeholders' interest in research was reflected in the extent of their involvement and willingness to contribute. There were barriers to effective engagement where stakeholder interest in projects waned.

Some barriers to engagement were a legacy of situations that limited stakeholder contributions, such as people who were too busy to attend formal meetings (which meant that informal communication was necessary), limited availability of staff and projects that were physically spread out (which affected the logistics of contact).

Other barriers related directly to stakeholders' limited willingness to be involved, which affected relationships. A lack of feedback from stakeholders could stymie engagement. Difficulties in funding for getting stakeholders on board were apparent, and some projects had a legacy of poor relationships with stakeholders. In the situations where engagement wasn't possible, the majority of work had to be carried by local CRC personnel.

Specific examples of where engagement was difficult included:

- Engagement of some federal partners was not possible because of their unwillingness to pursue the ideas involved.

- Some industry stakeholders did not see themselves as partners or as having a stake in the CRC, and perceived the CRC as free research providers. The CRC tried hard to get them involved, but they were really only interested when the research had a direct and specific impact on industry development and core business (e.g. application to environmental impact statements). When the research produced outcomes, industry did want them. Industry supplied information when it was at no cost to them.

- You never know what they will say. For example, a stakeholder representative said (not politely) that researchers should stay out of deep water and stick to shallow water and estuaries. This was politically motivated, as mapping was perceived to affect fishers' current open access to the area.

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Diversity of stakeholder interests

The wide range of interests meant that it was sometimes difficult to address and deliver on all of the stakeholders' expectations. Differing agendas between researchers and stakeholders, and the variety of stakeholders' needs, made it problematic to accommodate all interests. In these situations, it was possible to focus on only one component because the research aim was to achieve simple, quick and unambiguous answers in complex systems. The diverse nature of subprojects meant that there was no single body of stakeholders that was appropriate for all research groups, which had implications for coordinating engagement.

Extent of consultation

The problems with getting people involved were due in part to a lack of appreciation for scientific knowledge on the part of some stakeholders. It was often difficult to get people involved in highly theoretical research because it took too long to become acquainted with the concepts. Sometimes there is a bit of anti-science perception that scientists are just out there following their own interest. A lack of openness to new knowledge was evident in that some people only believed in their personal experience and were not receptive to other evidence; they had "short memories" and this left researchers frustrated. One comment was "Stakeholders need to be open to new knowledge and new ways of managing—some think [they] don't need new knowledge".

Miscommunication between researchers and stakeholders was a problem, as was over-consultation with some stakeholders (on the part of the CRC). The apparent strategy of having many people studying regionalisation led to some areas being overstudied. For example, the Fitzroy Basin Association had nine research proposals at one meeting.

Relationships/engagement with stakeholders

There were problems with maintaining relationships with stakeholders, due to both institutional arrangements and personality clashes.

There was frequently tension between state and local governments, which meant there was a struggle for people not to lose their cool. People were cynical about the power of research to change institutional arrangements and there were within-government difficulties and demands, such as managers wanting to see research papers and outcomes beforehand (even though this was CRC

research). Involvement in projects required higher levels of approval than normal, which may have led to frustration. It was sometimes also difficult for scientists to listen to what they saw as 'superfluous information' as they aren't usually known as good communicators.

Being unable to engage stakeholders, either because the research was not on the political agenda or there was no mechanism for engagement at the political level, was also a source of difficult relationships. Some researchers expressed light-hearted jealousy over the relative wealth of industry researchers, especially when they travelled business class and university/ government researchers travel 'economy' (Plate 4.6).

Plate 4.6. Ah, the benefits of being an industry researcher!

Personality clashes also created tensions, with mistrust of government stakeholders, conflict between the CRC and some stakeholders, and dysfunctionality within some stakeholder groups (e.g. disagreements as to the support of projects). As one researcher put it:

> *A good part of communication is working through the different roles of people to come up with a good product, and the joy is when you see regular communication and see information moving and doing work. However, the flip side is frustration.*

Staff turnover

The transition of staff within organisations interrupted the progress of projects. This occurred where negotiations had been carried out with key people (e.g. a subproject leader), then they left, which meant that it took time to get new people up to speed with projects. Similar situations happened with transition in staff and changes in regional bodies' needs, which resulted in discontinuities for both researchers and stakeholders. Another situation was where people who were the original motivators and were committed to projects had retired. Organisational restructures also meant changes in partnerships. These situations create problems with trying to maintain relationships with particular interest groups.

Project coordination and management

Setbacks with projects occurred where project coordination and management was disjunct. Stakeholder groups and buddies relied on having a dedicated convener, otherwise engagement was problematic. There were cases where responsibility for coordination was unclear, such as misapprehensions that other stakeholders were responsible for certain work. Lack of alignment with other aspects of CRC projects (e.g. community and local government partners) also obstructed engagement.

Resourcing

The closure of the CRC was cited as a cause of the lack of resources available for uptake. Also, the CRC didn't have much free cash, and a general lack of funding that could be used to support engagement was a downside. This was demonstrated with the need for money for plane trips, although in some cases there wasn't a large proportion of money set aside for engagement. A need to provide technical information in an accessible form was also a major cost. Challenges were encountered in the need to secure extra funds to manage projects and, in some cases, despite the CRC's involvement in looking for external funding, this support didn't eventuate. New work was also taken on by researchers without being able to attract additional resourcing to handle it. A three-year project became a two-year project after it was set up, then it took another year to find out that the researchers didn't get funding.

Politics

Barriers to engagement included organisational politics, where particular stakeholders perceived that they should be managing the new project but couldn't because of their stakeholder role, and because others were managing it. In some cases, internal processes meant that some representatives had to have their responses checked by senior managers prior to giving it back to a researcher. Political barriers, though, were seen as only short-term impediments, and that it was necessary to 'just hang in there.

CRC strategies

A few CRC strategies and processes hindered progress, such as project approval which sometimes took up to one year. The CRC also sometimes over-specified projects which disallowed flexibility in negotiating. Any big changes to projects required board approval and the support of the CEO, which could also affect engagement.

4.14   Effectiveness

Researchers were asked how effective they had found their engagement methods to be in achieving the aims of their engagement. Most simply responded that they had been effective, very effective or exceeded expectations, citing positive feedback, ongoing engagement, use of products and development of new study sites as evidence. Others minimally got the information they needed.

The success was dependent on stakeholder interest in the project, with 'general' stakeholders making it a lower priority and their interest was not always needed for the success of the project. Others needed wider ownership than they had. One researcher felt they didn't know whether the engagement had been effective while another felt it would have worked if it had been carried out properly.

There was a learning curve, with engagement becoming more successful as researchers and stakeholders became more experienced. In the end, some felt it could have been more effective at gaining trust and being more sustainable.

The biggest barrier to effectiveness was lack of time. Some had a lack of researcher time on the project, others ran out of time towards the end of the life of the CRC, feeling the real gains will come later. These time limitations, particularly, made it difficult to fit in with regional body time frames. Another limiting factor was sensitivity over state government data.

4.15   Benefits of engagement

Engagement with stakeholders brings both advantages and disadvantages. This discussion outlines the benefits of partnerships in several areas: resourcing, implementation, networking, knowledge, and the relevance and applications of research.

Improved resourcing

Additional funding through stakeholders such as natural resource management groups was a considerable benefit. For example, in one project there were huge benefits from forming partnerships in New South Wales, in sharing the workload and gaining resources to make a computerised version of the research outputs. Using the local resources of stakeholders was also beneficial. For example, using the ship *Rum Rambler* was great way of engaging with local coastal interests and disseminating information.

Effective implementation of research

Implementing research projects often could only be undertaken with other partners. Collaboration tended to focus the direction of research work, and determined the way research was undertaken. Research needed to be based on identifying the community's real needs and the problems to be addressed, from a variety of perspectives. It also allowed for genuine ownership of outputs, which led to better implementation overall. For example, researchers didn't need to go out and 'sell' the research, as the users were already engaged.

Improved networking

Establishing networks and engaging stakeholders was considered fundamental, as often the stakeholders were the genesis of research (e.g. Conservation and Land Management, Western Australia). Stakeholder engagement was considered necessary, whether the research was technical or not. Networking enabled accessing the knowledge and experience of others, being able to ask questions, and to disseminate findings.

Workshops were useful in building networks and developing relationships, which made ongoing communication and interaction easier and more effective than dealing with strangers. Benefits were realised with international interest that raised the profile of research projects, such as a review of a Norwegian research centre, a seabed classification project and joint work with Chinese scientists on dam-building on the Yangtze delta.

It was noted that there isn't any point in undertaking research without regional and local stakeholders. In applied science, as most of the CRC's research was, researchers need to know there is a social context and value for everything before it is done. The value of networking is friendships, information transfer and maturation of people's knowledge of systems, which are good outcomes for working eight hours a day. Such was the benefit of networking that momentum on some projects would continue after the CRC closes.

Gain knowledge and skills

Both researchers and stakeholders were able to gain new knowledge from each other. Partnerships were extremely beneficial from an educational perspective, and learning was seen as a two-way process. Researchers gained a perspective of regional and local knowledge, and stakeholders were educated about the science being used and the environmental impacts of human activities. Partnerships were also useful to raise the profile of research and the CRC.

Benefits for researchers in terms of the knowledge gained included input from other researchers, instigation of new projects from collaboration, an understanding of the general processes (which were good for knowing how to implement future management of projects) and understanding the issues that interested people. Access to information, local knowledge to help select suitable study sites and getting feedback on models and indicators were also advantages of collaborating with stakeholders. From a personal development perspective, there was development of researchers' communication skills—of having to communicate work to a range of people from different backgrounds and having to think about how to deliver the project's message.

Relevance and applications of research

Determining the type of research that was relevant to stakeholders' needs, and being able to disseminate the outcomes of research through applications were definite benefits of engagement. The value of having input from stakeholders is that their specific needs could be identified, so that research outcomes and products could be developed that would have direct relevance to their needs and therefore would be useful.

By having close and consistent involvement by stakeholders, it was possible to foster a sense of their ownership in projects. This was critical to ensure that the products developed were functional and had a greater chance of being taken up by stakeholders. For instance, engagement assisted in the preparation of a final report for a general audience, as this was exclusively aimed at answering stakeholder-specific questions. Also, different stakeholders may have very different ideas and expectations for projects, and engagement ensures that the research will be useful to the people who matter. Without this support, researchers are 'in a vacuum and products will sit on the shelf'.

4.16   Disadvantages of engagement

The disadvantages of engagement include the problems encountered with resourcing, management, the time involved, unrealistic expectations, conflicting perspectives and politics.

Insufficient resourcing

The lack of funding meant that effective delivery of outcomes (particularly outcomes that stakeholders expected) became a lower priority for some projects (i.e. doing the research was a higher priority). High transaction costs were also a drawback. Consistently adequate support to conduct research would also have been preferred. Improved quantifying of funding for stakeholder engagement to be included in initial project proposals would help overcome this.

Difficulties with management and administration

Projects tended to be hard to manage, due in part to the administrative requirements (seen as "a nightmare" by some researchers). Where changes were needed in project deliverables, for example, shifting milestones, a great deal of justification was required. Various other management issues were cited as a disadvantage, including the time taken to achieve results, remoteness of stakeholders and changes to staff. Trying to manage the large number of players in projects led to resource-related and psychological burdens, regarding both the time and travel and angst involved.

Time involved

Time was by far the biggest issue. The range of activities to be undertaken within projects was considerably time-consuming. It was difficult to meet all expectations, and there were too many requirements of researchers. The time taken to travel to meet stakeholders as well as other project administration requirements was a definite disadvantage.

Unrealistic expectations

Stakeholders tended to create expectations of researchers that were difficult to meet because of limited resourcing and the lack of time. People had to deal with mismatches of expectations between researchers and stakeholders.

Feelings about asking project partners to contribute too much were mutual; stakeholders would ask researchers to do something extra, while researchers would expect stakeholders to attend meetings or provide feedback within short time frames. Researchers felt that they might become 'captured' by stakeholders, or over-reliant on them for input, thereby placing unnecessary demands on them. Stakeholders could feel that they had been used, since researchers were seen to 'bail out' at the end of projects. On the other hand, it was expressed that some stakeholders needed coercion to contribute where contributions were not always forthcoming.

Conflicting perspectives

The difficulties encountered with dissimilar expectations are grounded in the conflicting perspectives of researchers and stakeholders. Stakeholders were characterised as not always being right, not asking the right type of questions, and of being secular and institutional. Trying to get more people to understand the research was sometimes difficult, and a conflict of views sometimes led to tensions.

There were also concerns about exposing people to 'unpalatable truths' that might lead to negative attitudes (Plate 4.7). This would have the effect of bringing interpersonal issues into the open. It was not possible to tell what the reaction of stakeholders would be with some issues. In one case, fishers were invited to dinner with a politician and swore at researchers. But by the end of the night fishers were offering their boat time and asking for more than researchers could deliver. Fishers wanted to get involved as individuals and as a group.

Plate 4.7. Disputed truths can cause tensions and hostility

On the other hand, researchers indicated they have had a negative reception and have been 'run out of town'. There has been serious threatening behaviour towards interest groups because of bad communication with the community.

> *Sometimes people will talk for the whole meeting because they have an axe to grind and feel like they haven't been listened to before…When you engage, you open the door to everything, not just the good stuff, and this can be time wasting.*

Politics

Dealing with the politics of organisations and local groups is another source of angst, particularly where one group is pitted against another. However, it was noted that politics is a fact of life. One researcher commented that it was generally possible to reduce political turmoil by providing good, defensible information.

4.17   Potential improvements for stakeholder participation

From their experiences with what helped and hindered the engagement process, researchers were asked to make suggestions for improving the process in the future. These improvements include clearer definition of projects and interest groups, determining the level of stakeholder commitment, resourcing, communications and delivery of research outcomes.

Clearer definition of stakeholders

Projects would benefit from a much clearer definition of stakeholders and their responsibilities and roles. The National Estuaries Network was seen as an excellent stakeholder group. A clearer definition of stakeholders would help to improve the research undertaken, as was exemplified by two projects that were combined where the stakeholders were different. The regional bodies would have been the natural stakeholders but were in the process of becoming established and were unprepared for involvement.

Involvement of more stakeholders outside Queensland would be preferred for certain research projects. Better identification of the centres of power in stakeholders would help to reduce uncertainties about responsibilities for project management and would be likely to speed up some processes. Researchers need to be able to 'talk turkey' with stakeholders and not just beg for money. Defining stakeholders would improve access to key people who understand the dynamics of organisations, and who have local knowledge and contacts to facilitate engagement. Targeting stakeholders who have particular interests in this way would be more effective than engaging groups through workshops, which are often too broad in the diversity of interests represented.

Stakeholder commitment and support

Improvements should be made in the levels of commitment and support of projects by stakeholders. Generally, there needs to be strong commitment on both sides—researchers and stakeholders alike. For example one project lacked partner commitment and another had reasonably good participation, although their national partnerships needed more 'clout' to achieve results.

Aiming for participation that is inclusive and based on trust and respect was more effective than following adversarial-type partnerships that foster competition between partners. Such inclusive participation helps in bringing together the needs of scientists and partners with those of resource planners, managers and other interest groups. It also assists in developing skills to facilitate scientists and stakeholders working together. Indeed, there should be more effort to reconcile the interests of these groups, as engagement is not core business for academics.

Not only was more targeted interaction with stakeholders touted, but also some felt there should be more interaction and engagement in general. The possibility of doing 'free' analyses and research for stakeholders was perceived as a way of improving engagement (although that would benefit only stakeholders and not researchers, at least in the first instance). There is a need to have ongoing engagement, rather than the 'fly-in, fly-out' approach previously taken, although there were concerns of losing momentum and energy with this more continuous approach.

Concerns with achieving commitment from government stakeholders were strongly expressed by one researcher:

> *We don't get good people high enough in the state government system, and we're left with some bad people in state government who are a nightmare to work with. We see little difference and the same faces when we interact with state government, and they have never changed their opinions or learned. There needs to be a 'clean out' of bureaucracy—good younger people are held down because there is not enough movement through the system. State government is not connected with regional NRM processes—and they don't want to be—and they see this engagement as a threat to their own powerbase.*

Clearer definition of projects

Projects would benefit from more obvious definition and scope, so as to avoid them becoming 'dumping grounds' for research that doesn't fit anywhere else. The CRC did a lot of work that was considered as 'bits and pieces about different

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things' and had a lot of stakeholders all over the place. Greater focus on longer-term policy initiatives would have been better, because research that involves specific questions based around specific policy-driven issues or needs would achieve better engagement with continuity.

Basing the design of research on a longer time frame would have benefited one project, where a more long-term study would allow greater involvement of stakeholders. This would be particularly evident with their anecdotal information, which would be useful in building up a historical picture of the site and the environmental relationships.

Project outputs could be targeted for take-up by other projects, rather than splitting researcher time between projects, which uses up too much of the researchers' time on project overheads. Other improvements would be to integrate work more with project milestones, and for reporting to be no more frequent than six-monthly.

Flexibility

Adaptive management was acknowledged as a means of being able to accommodate changes in projects. In situations where the knowledge of stakeholders had grown, researchers changed their engagement approach to suit. Situations were identified, though, where better adaptive management would have proved beneficial. An improved capacity of researchers to respond to changes in staffing would be an advantage, particularly where the level of trust between partners depended on continuity of frequent contact. Succession planning for when people leave would be one way of managing this. There was a need to balance adaptability and deliverables through effective project management, which is an issue that should be recognised at the start of projects. This would satisfy funding partners' requirements for deliverables within a flexibility that could adapt to changing stakeholder needs.

Timing of processes

More time would have been preferred to complete research and achieve all project objectives. Building additional time into the design of projects would have allowed more effective stakeholder engagement and communication, and greater opportunities to form networks and consolidate relationships with stakeholders.

The timing of activities could have been better managed to coincide with stakeholder activities, such as regional plans. Decision-making and approval of projects should have been more expedient to allow time for research. However,

there can be a tendency for the time taken to expand to fit or even exceed the available time.

Control of research

There were concerns about the degree of flexibility shown by the CRC in accommodating a range of issues—expressed as a "tough call"—in that they were flexible for some issues but not for others.

Similar sentiments were expressed about government control over what could be researched in the policy area by government researchers, as research that is critical of policy is not encouraged. A lack of support to attend international conferences was also apparent with government, which leads to "difficulty with trying to do research in public service and trying to be a professional researcher".

Resources

More resources in general would be required, mainly to have greater capacity to deal with the diversity of stakeholders and to maintain physical contact with them. More funding needs to be provided to allow for stakeholder participation, travel and people's time to be bought; more resources should be put into products and delivery of research, and for more interaction with networks (e.g. National Estuaries Network). Having an organisational allowance to facilitate networking would be desirable. New projects could have multiple community and regional workshops written into the budget—not just for the transfer of information but for genuine consultation in asking what they want to do.

Communication and research support

It is essential to keep stakeholders informed and interested at all times during research, so continuous communication is crucial. Understanding through communication what stakeholders are doing, and their needs, is important in being able to maintain interest and to 'move forward together'. One project partially achieved engagement through an e-distribution list, which was pitched at a wider audience including universities and landcare (20–30 people) to get input to a literature review. However, the list was used only once, and it would have been preferable to communicate more and to have built in more time for it.

Delivery of results and applications

Participation could be improved where presentations to stakeholders include visualisation aids, such as animations. There is also a need to include and demonstrate on-ground applications for research, for example digging holes, checking water levels, testing soil samples and determining carbon levels.

4.18   What was different about participatory research in the Coastal CRC?

Most CRC researchers work for partner research organisations and also conduct research in a non-CRC context. A comparison of the CRC's processes for engaging stakeholders with those of these other projects allows approaches to be identified that could facilitate improved engagement of stakeholders. Engagement is approached from the perspectives of the diversity of stakeholders integrated, the effectiveness or strength of stakeholder integration, working relationships between partners, how efficient CRC research processes are, extent of the knowledge base and promotion of research applications.

Diversity of stakeholders

Researchers were cognisant of the range of stakeholders that they could engage. The very strong client focus of projects was apparent in the efforts to foster interest from a diversity of stakeholders. Not only were traditional stakeholders with direct interest in research projects engaged, but also those with indirect interests, which increases opportunities for identifying wider applications for the research. One respondent mentioned the enormous diversity of research interests represented. The excellent brokerage role of the CRC and representation of stakeholders within agencies and networks is seen to contribute to generating a diversity of interests. International stakeholders, too, were impressed with the amount of networking and number of stakeholders available.

Effectiveness of stakeholder integration

The strength of stakeholder relationships was apparent in widespread recognition that the CRC perceived engagement as important and had an effective process for this. Integration was much more explicit than for other CRCs and other research projects, and the planning and structure involved in integrating stakeholders was clearly defined and easily executed.

The integration of new stakeholders can benefit from having an existing group of stakeholders that can be tapped into. Stakeholders are given opportunities for input into research projects, and there is strong involvement for people in institutions to collaborate on inter-institutional research. One researcher found that while the CRC was very technical, it found a niche between two projects by encouraging participation, and the work now strongly engages stakeholders. An apt comment was "if you want to be successful, surround yourself with successful people".

With strong integration of a wide range of stakeholders, interest in research can be maintained long after work has finished. For example, the development of OzEstuaries indicators had huge stakeholder representation, and the researcher still fields enquiries about the work.

In an Australian setting, the aim or intent for stakeholder engagement was higher than in most other institutions, although it was not always achieved (due to resourcing, politics, etc.). However, one researcher commented that by international standards, the extent of stakeholder integration was just average— it is what everyone would usually do in some other countries.

Working relationships between stakeholders

Once stakeholders are engaged in CRC projects, working relationships between researchers are generally harmonious. The integrative nature of the CRC is expressed by one comment, "As a research organisation, people are more likely to come to you to ask for things".

However, some perceive that relationships are sometimes strained, due to a range of issues. For example, there can be difficulties in the relationship between public servants and academics. Relationship problems sometimes occurred when partner institutions employing researchers were not as interactive or cooperative as the researchers would have preferred. Intellectual property issues sometimes caused tensions. There were also many competing scientists trying to out-do each other within the CRC, but they linked well in their individual groups. Also, some institutions in the CRC are financially under-resourced, and are protective of their time.

There was, for some researchers, a reluctance to become involved, due to the belief that they were not in the CRC to provide a service. Ultimately, however, these researchers enjoyed the experience of being involved.

Efficiency of processes

There were mixed opinions about the processes followed for project establishment and reporting. In some situations, there was less 'red tape' and bureaucratic processes than in government agencies and consequently the CRC was less political. However, in other situations the CRC was seen as more political and added another level of bureaucracy because of the contract negotiation and reporting processes involved.

The CRC expected considerable effort from researchers to negotiate contracts and report regularly. This appears to have been a significant, ongoing issue for a number of researchers. One said that writing an Australian Research Council proposal was more difficult but in the CRC the project approval and review processes were unclear and not straightforward. Report writing was very time-consuming, and seemingly unjustified because of the lack of financial gain or other perceived benefit from it.

Others were generally satisfied with CRC approaches. Having a formal process for integrating stakeholders was better than the word-of-mouth approach taken by others outside of the CRC. For example, the publication *Flotsam and jetsam* was recognised as a useful tool for gaining involvement. The CRC's role in brokering relationships was seen as excellent, particularly with the greater focus on stakeholders and the community (e.g. Moreton Bay Partnerships). Depending on the project, there is more flexibility for integrating stakeholders than in other research organisations.

Extent of knowledge base

The knowledge and expertise of the CRC was initially seen as very technical and science-focused by one researcher, although community science and participatory methods became strongly apparent during the life of the CRC. Different projects emphasised different aspects of technical and social sciences, where some non-CRC projects concentrated only on engagement or only on archival materials. There was satisfaction with the CRC promoting the idea of knowing what people want and in 'getting out there'.

Obstacles were encountered, though, with difficulties in the CRC understanding social research. CRC research was seen to be dominated too much by biophysical natural resource management issues. Perhaps because of this barrier, relationships with the CRC were minimal for some social researchers. Concerns were also raised about the lack of understanding of proposed innovations in planning and social research.

Application and promotion of research

A strong research focus was appreciated, and the orientation towards commercial applications of research engendered strong interest in the CRC from stakeholders. This interest was summed up by the comments that "research with no applications are not worth their salt" and "if a nation doesn't do research it has no soul".

The promotion of research through publishing does not interest commercial partners, but when promotion of applications is combined with academia, research can achieve significant outcomes. Consultants tended to publish more, particularly with case study-oriented material. However, the publishing avenues offered did not seem useful for academics. Coastal management journals were not regarded as 'top notch' journals.

4.19   Changes during the life of the Coastal CRC

Twelve of the researchers (38%) had conducted projects in both rounds of the CRC. This enabled them to say what they thought had changed about stakeholder engagement methods. Changes to CRC processes with the inception of Round 2 led to improvements in the involvement of stakeholders. Issues apparent are the degree of involvement, changes to CRC support processes and strategies, and the support of stakeholders.

Degree of involvement

General comments on the amount of change, which can be described in terms of the strength of stakeholder involvement, were varied. Engagement for some was perceived as stronger in Round 1, with involvement declining in Round 2. One project concentrated on modelling research in Round 2, and stakeholder involvement was less pronounced. Yet there were some indications that involvement was much more effective in Round 2.

Where involvement was absent in Round 1, researchers were unfamiliar with the engagement processes, and had to practise to make involvement work in Round 2. Stakeholder involvement was strongly encouraged, even made mandatory, in Round 2 projects. This led to one opinion that there was more practical, 'hands-on' work for Round 2. Engagement was also perceived as a phase of data delivery to stakeholders.

CRC support processes and strategies

Some changes in CRC processes to support stakeholders have been welcomed. The idea of 'buddies' has meant that networking increased and more people became aware of CRC stakeholders. This has improved overall the engagement of stakeholders in projects. Also, consolidation of researcher time on a single project in Round 2 was more efficient.

An example of where CRC support for projects fell short, though, was where stakeholders for one project asked big picture questions such as 'Do flows affect fish stocks?' or 'Does clearing mangroves impact on mud crab numbers?' These questions require large-scale projects to answer, which are too big for the CRC to manage. This has led to some stakeholder disappointment. However, stakeholders are generally getting wiser about the limitations of what can be done.

Support and involvement of stakeholders

Engagement of stakeholders, for the most part, improved in Round 2. In one case, there was generally no direct contact between researchers and stakeholders in Round 1, as this was handled by key project team members. One problem with Round 1 was apparent with 'egalitarian' funding, where a lot of researchers with a little funding were doing a lot of work.

The establishment of regional bodies presented identifiable stakeholders that researchers could involve for Round 2. The immediately available pool of stakeholders improved the ready and more complete incorporation of stakeholders from the outset of projects. The nature of involvement of stakeholders changed from the presentation of information sessions to active participation.

There is still, however, a need to more fully incorporate senior representatives of CRC partners (especially state government agencies) in initial planning and implementation. Promotion and perception of some projects improved in Round 2, particularly for citizen science, which was taken more seriously.

These changes have not been without adverse impacts, though. There were difficulties with the CRC establishing stakeholder groups in three catchments that ultimately did not work out. This included some difficulties within the organisations selected to provide the primary stakeholder input in South East Queensland and the Fitzroy during Round 1. In SEQ the organisation was

somewhat structurally dysfunctional and in the Fitzroy it lacked capacity. In Port Curtis there was difficulty establishing a group at all.

Influence on these changes

Researchers were asked what they thought influenced any changes they perceived in engagement methods between rounds 1 and 2. Issues that influenced the changes in Round 2 projects include CRC strategies and processes, the expectations of stakeholders and delivery of research outcomes.

CRC strategies and processes

The changes in some CRC strategies resulted in both advantages and disadvantages for various researchers. Among the causes of these changes were remapping themes, and strengthening the integration of stakeholders, particularly by expanding the scope of integration to include external people. This resulted in a wider client base. Buddy groups were perceived as beneficial, and the approach taken in Round 2 focused more on extending science to the end users. For example, some wetlands projects were integrated and emphasis was placed on defining the key messages and how to get these out to users. Changes in the CRC board and executive management also precipitated changes in Round 2.

For some, the time spent getting the CRC going in Round 2 meant that there was less time dedicated to stakeholders, despite the ethos of stakeholder integration. Another perceived problem was that the CRC board was dominated by state government interests, resulting in self-serving decisions which the CRC 'went along with'.

Stakeholder expectations

The expectations that stakeholders had about the CRC in Round 1 affected working relationships and the support provided for projects. Some stakeholders had the wrong expectations about the role of the CRC, and treated researchers as consultants. Consequently, there was the presumption that the researchers would assume full responsibility for running projects. On the other hand, one stakeholder group took on the role of managing CRC researchers rather than working with them, which did not benefit the project.

A significant realisation was that for effective delivery of outcomes in a regionally focussed program, there needs to be 'ownership' and close involvement of the potential end users such as resource planners and managers. There was tension

in the CRC model between 'what the partners/scientists would like to do' and 'what the resource planners and managers need', so there is a need to bring these groups together early in projects and maintain contact. This leads on to the need to research what stakeholders are doing as a means of preparation for setting research objectives and direction. Without having some idea in advance of what stakeholders require, they can't be approached with the question 'What do you need?', as the answer is likely to be 'What can you do?'. Greater ongoing dialogue is needed with stakeholders to determine their needs.

Delivery of research outcomes

The delivery of research applications from Round 1 projects also affected the involvement of stakeholders, particularly to strengthen and broaden engagement. Publicity of research was needed, and the CRC made a concerted effort to encourage researchers to deliver. Scientists need to consider the end users more because research is publicly funded. As an example of how the delivery of research affected projects, the citizen science toolbox project delivered definite outcomes and gave the program more credibility. The change of theme leaders also helped push this focus.

5   Conclusions and recommendations

stake·hold·er (stāk'hōl'dər) *n. One who holds the bets in a game or contest.*

This report presents the views of the researchers on the engagement processes within CRC research, its pros and cons, bridges and barriers, what made a difference and what could work better. In addition, the engagement indicators used at the beginning and end of the Coastal CRC research program give an indication of what has changed and how much, and evidence from CRC management tools and documentation indicate some possible explanations for these changes.

5.1   The engagement assessment framework

The eight indicators that were used to measure attributes of engagement can show the progress the CRC has made in its engagement processes over its seven-year life. Those indicators are:

1. The power level of those engaged

2. The intentionality of engagement

3. The degree of responsibility-sharing with stakeholders

4. The stages at which stakeholders were engaged

5. The flexibility shown in adapting to stakeholder needs

6. The incorporation of different knowledge systems

7. The workability of engagement processes

8. The effectiveness of engagement processes.

There was a concerted effort put into engagement in the second half of the research program, much more focussed and intentioned than in the first. This is evidenced by:

- Specifying the engagement required *within* projects in:

    o Project guidelines

    o Project agreement guidelines

    o The milestone review process

    o The terms of reference for advisory groups

- Management support given to the engagement process by

    o Assisting in engaging stakeholders through study area coordinators

    o Assisting with communication processes by engaging professional communicators and web designers

- Restructuring the project management process around study areas to consolidate stakeholder interests across the research.

An assessment of the Coastal CRC's performance against the eight engagement indicators, as expressed by researchers surveyed, is presented as a report card in Appendix 1, and is discussed below.

5.1.1   Power level of those engaged

One of the aims of deliberate stakeholder engagement is to give a say to those with an interest who would not otherwise have had one. In this assessment stakeholders have been loosely classified as decision-makers, community leaders, the general public and the disempowered. Naturally, the boundaries between these categories are blurred.

Figure 5.1 presents an analysis of survey respondents' views on the Coastal CRC's performance against this criterion, both at commencement in 2001 and just prior to the CRC's closure in June 2006.
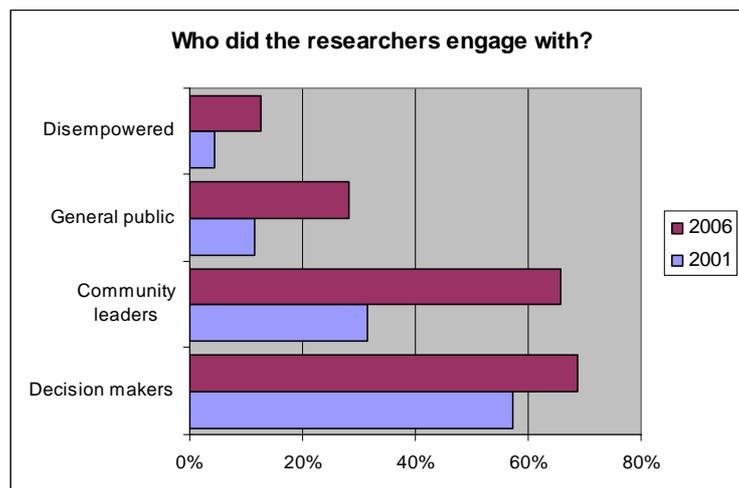
Figure 5.1. Who did the researchers engage with?

Engagement in all categories increased, the most remarkable being the doubling of working with community leaders. This is likely to be explained partly by the increased targeting of that sector by CRC researchers and management but also

by the rise of the regional bodies as a natural resource management institution during this period. In Round 1 the Fitzroy Basin Association was the only regional body that was functioning and though it was widely engaged the capacity to be involved was limited due to number of personnel (two at that stage) and the experience of the organisation. There could be some argument as to whether regional bodies belong in the 'community leaders' category, since they have government funding which they allocate, and in this sense are decision-makers, and since it is unclear to what extent they represent 'community'. Notwithstanding these factors, since they are non-government organisations and have community groups among their constituents, they were considered community leaders. This is one example, however, of where the boundary between categories is blurred.

Also of note is that the engagement of the general public more than doubled, though it was still only half that of community leaders. Again, this is largely due to targeting, but also being at the end of the research, the final results are available to the public. Decision-makers remained the most popular sector to involve, largely due to their capacity to utilise the results of the research.

The CRC originally envisaged, through its citizen science theme, that the community, or general citizens, would become involved in the science of the CRC. In Round 2 of the research project approval process the CRC introduced stakeholder analysis as part of the research design process. Through this, and through experience from Round 1, it became evident that the most productive stakeholders to involve were those who had most capacity to use or contribute to the research. For general community members, the research is only one of many competing interests, they are not paid to contribute and they usually don't have the level of specialist knowledge needed to be closely involved in the research process. For these reasons, general community stakeholders have less involvement in the research.

5.1.2   Intentionality of engagement

This refers to the degree to which intentions to engage stakeholders were followed through, or actioned. A common problem with social actions is that people often express aspirations or intentions to do things which they ultimately don't do. They may even think they did things that they didn't do. It is this that this section attempts to assess.

Figure 5.2 presents an analysis of survey respondents' views on the Coastal CRC's performance against this criterion, in 2001 and again in June 2006.
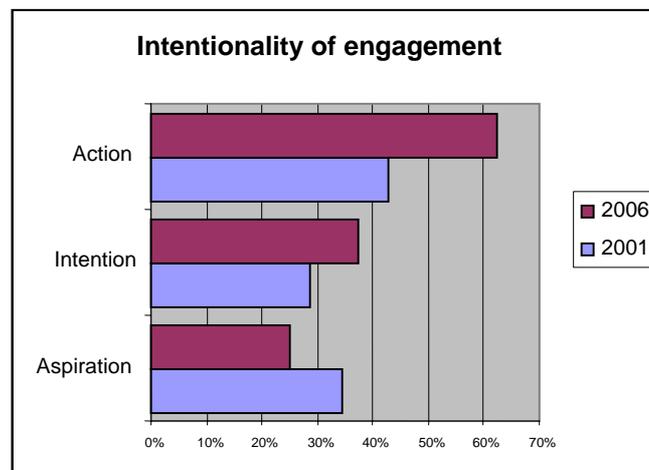
Figure 5.2. Intentionality of engagement

Actioning of intentions is difficult to assess, particularly from the point of view of those who are being assessed. Probably all we can say from these results is that the proportions of what researchers aspired to, they were able to action. This is a little different from the Round 1 assessment, which was undertaken in advance of the research being carried out. In that case the comparison was between what was hoped for in terms of the aims of the research and what was promised in deliverables.

There has been roughly a 50% increase in the proportion of engagement intention that has been actioned. This is a very significant increase and undoubtedly the CRC's determination to achieve engagement played a role. However, looking at the picture at the end of the research process instead of the beginning one would expect to see most of the engagement intentions having been actioned. It is a concern that a significant proportion (~35%) remains in the intention (or planning) phase. With only two months to go before the end of the organisation there must be significant doubt that these intentions will be realised.

5.1.3   Responsibility-sharing with stakeholders

The degree to which researchers share the decision-making power with those they engage can be classified according to a scheme developed by the Community Engagement group at the Department of Natural Resources and Water (NRW). This scheme is based on six classifications ranging from information sessions to community managed schemes. Using those classifications, Figure 5.3 presents an analysis of survey respondents' views on the Coastal CRC's performance against this criterion, in 2001 and again in June 2006.
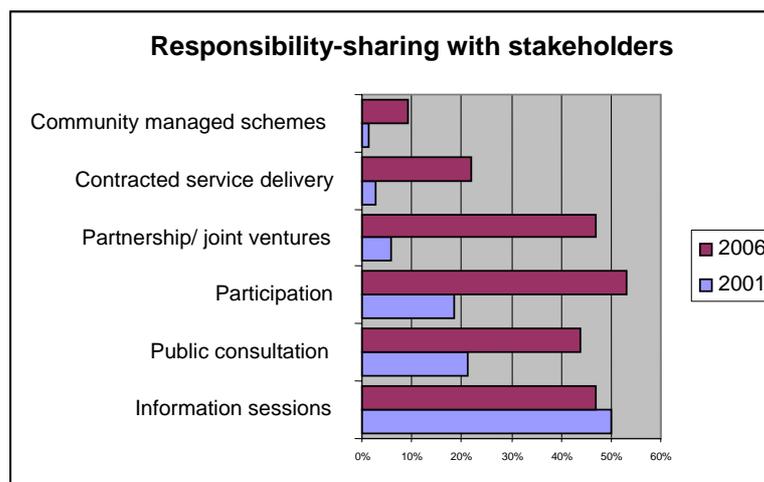
Figure 5.3. Responsibility-sharing with stakeholders

In the previous assessment the majority of the engagement planned was in the form of information sessions, with the proportion of projects dropping as the level of responsibility in the hands of stakeholders increased. There is a dramatic difference in the pattern of engagement five years later. Joint ventures, direct participation, public consultation and information sessions were all similarly popular, with nearly half the projects using all these mechanism.

The other notable change was the rise to over 20% from almost nothing of contracted service delivery. But the surprising thing about this is the direction of the contractual arrangement. They were almost all contracted from stakeholders to the CRC. When this scale was devised it was expected that these services would be contracted out. This means that the stakeholders retained control of this sector of the research. Undoubtedly this has come about through increased engagement of peer external researchers and regional bodies who have funding to undertake research.

The overall change of profile of the engagement is likely to have been influenced by the more mature stage of the relationships begun in Round 1, the increasing capacity of the stakeholders to participate and the CRC's requirements in Round 2 to have project-level engagement strategies (e.g. buddy groups) and management's ongoing support for engagement processes.

5.1.4   Research stages and stakeholder involvement

One aspect of the process that was problematic for engagement in Round 1 was that projects were developed largely without external stakeholder involvement. This then made it difficult to get people on board when they hadn't had a say and didn't necessarily want or believe they needed the research. The process was conducted this way in Round 1 partly because it was initially necessary to get the researchers on board with the process and for them to feel like they had a genuine say before they would own the research sufficiently to be strongly motivated to participate. The researchers could be seen in this way as the CRC's first and most important stakeholders.

Figure 5.4 presents an analysis of survey respondents' views on the Coastal CRC's performance against this criterion, in 2001 and again in June 2006.

Stakeholder engagement in research stages
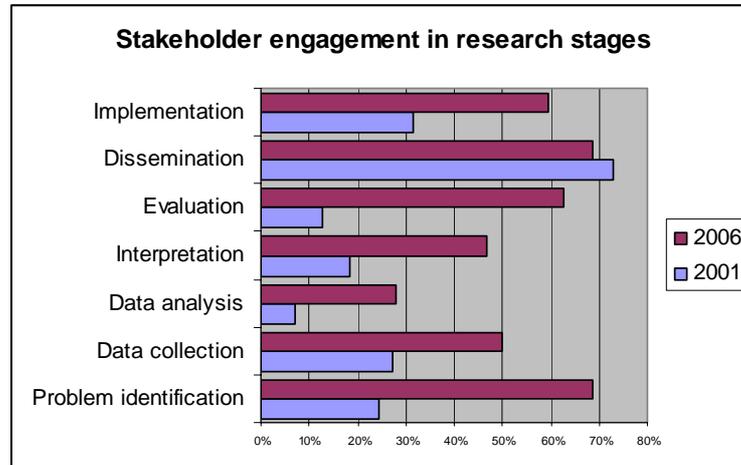
Figure 5.4. Stakeholder engagement in research stages

The most remarkable aspect of the change in the points at which stakeholders were engaged in the research is that the shape of engagement patterns has gone from one peak (during dissemination of results) to having a second, equally high, peak during the problem identification phase. All stages apart from dissemination have increased their participation two- to three- fold. Engagement during dissemination has gone down slightly, but that is seen to be a result of the

change of interpretation of 'engagement' by some researchers to mean that stakeholders undertook some responsibility for dissemination.

The nearly three-fold increase in involvement in problem identification was no doubt due to the reorganising of the CRC's research program around the study sites to enable better stakeholder involvement in problem identification and research gap identification for that area, and their insistence on stakeholder involvement for project approval. Also, by Round 2, there may have been some attrition of researchers who did not want to engage.

5.1.5   *Flexibility*

One of the issues with engaging external stakeholders is that they have their own time frames, workloads and other considerations to take into account when they become involved. A research process needs to be sufficiently flexible to be able to adapt to these changing requirements to stay meaningfully engaged with stakeholders. This is a problem with research that typically has a proposal approved which specifies the process and which must be followed to receive funding. This problem was observed during Round 1 research projects.

Figure 5.5 presents an analysis of survey respondents' views on the Coastal CRC's performance against this criterion, in 2001 and again in June 2006.
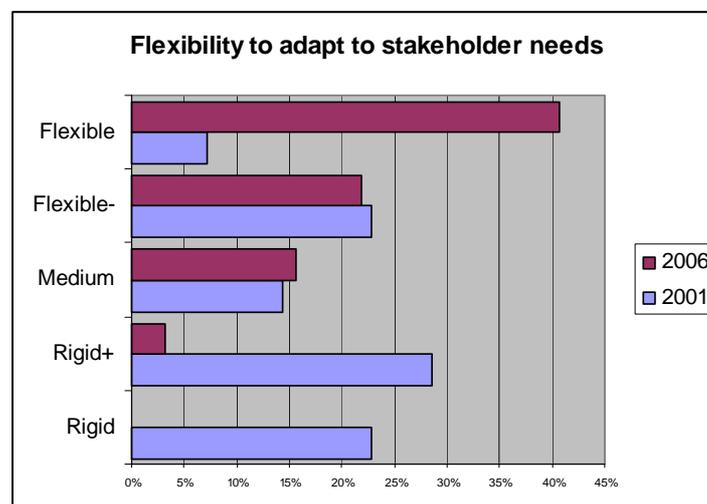

Figure 5.5. Flexibility to adapt to stakeholder needs

It can be seen that there has been a dramatic change in this regard between the two rounds. The process during Round 1 was mostly fairly rigid with few highly flexible projects. In Round 2 this is the opposite way round, with most projects

being very flexible, the numbers tailing off towards the more rigid end with none being regarded as really rigid.

This change has been a learning experience shared by CRC management, researchers and stakeholders. The CRC became involved in the project development process with researchers and stakeholders. Researchers gained a better understanding of the degree to which changes to original agreements could be renegotiated with the CRC, and the relationships built with stakeholders and their ownership of projects established during the proposal stage meant there was a greater tendency to maintain involvement and support. There is a considerable—but often hidden and difficult to quantify—overhead to research organisations and researchers who operate in a flexible way.

5.1.6   Incorporating knowledge systems

When researchers include diverse people in their research they have to deal with the challenge of incorporating the views of people who have very different ways of seeing the world.

Figure 5.6 presents an analysis of survey respondents' views on the Coastal CRC's performance against this criterion, in 2001 and again in June 2006.
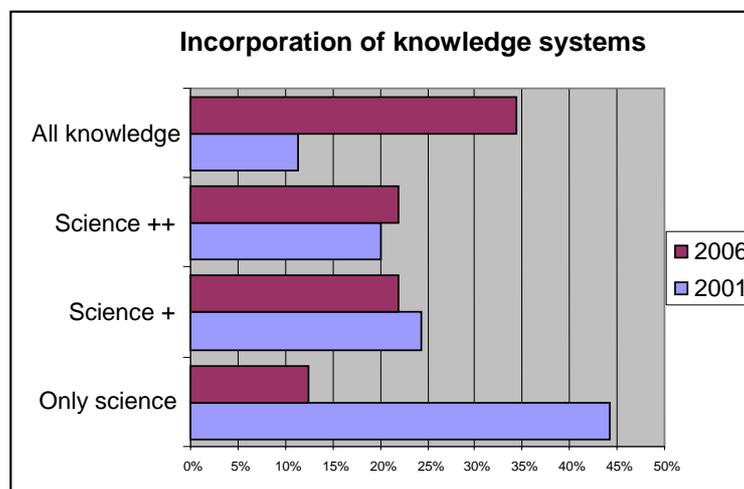
Figure 5.6. Incorporation of knowledge systems

Many of the initial research proposals in Round 1 were exclusively 'science' (i.e. biophysical science) based and did not allow scope for including non-science-based knowledge. The dramatic change between this and the research in 2006 is the swing away from pure science (a quarter of what it was) and towards incorporating all other views into the research (three-fold increase).

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This is likely to result partly from necessity. Once more diverse people are engaged, a way needs to be found to incorporate what is being said. Another factor expressed by researchers and stakeholders was the benefit of experience.

5.1.7   Was it workable?

There are many factors that can make engagement go wrong. Practical difficulties can result from lack of resources, problems with planning, personality factors and a host of other challenges.

Figure 5.7 presents an analysis of survey respondents' views on the Coastal CRC's performance against this criterion, in 2001 and again in June 2006.
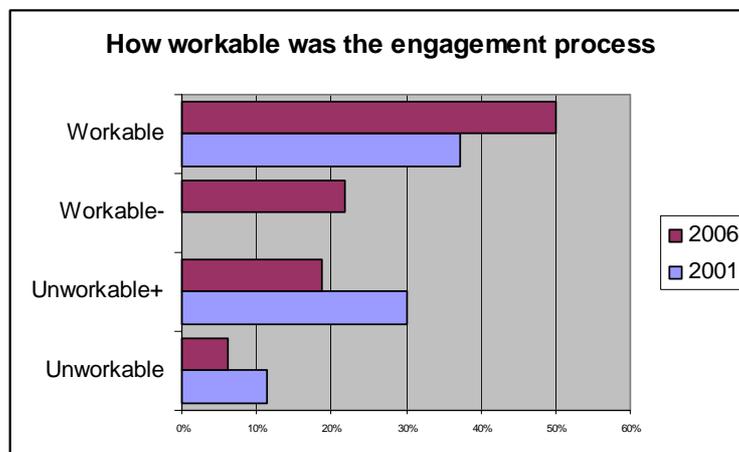
Figure 5.7. How workable was the engagement process?

Over the six years between the assessment points there was about a 40% reduction in projects for which these sorts of problems made the engagement fairly unworkable, and the proportion of projects where the engagement worked reasonably well has almost doubled.

This undoubtedly has many contributing factors. These include that the engagement strategy was well thought out, planned and resourced from the start; that stakeholders were consulted from the start; reduced reliance of particular stakeholder groups and their increased capacity to participate; and the increase in experience on all sides—researchers, CRC management and the stakeholders.

5.1.8   Effectiveness of the engagement strategies

Figure 5.8 presents an analysis of survey respondents' views on the
effectiveness of the Coastal CRC's engagement strategies, both on
commencement in 2001 and again near closure in June 2006.
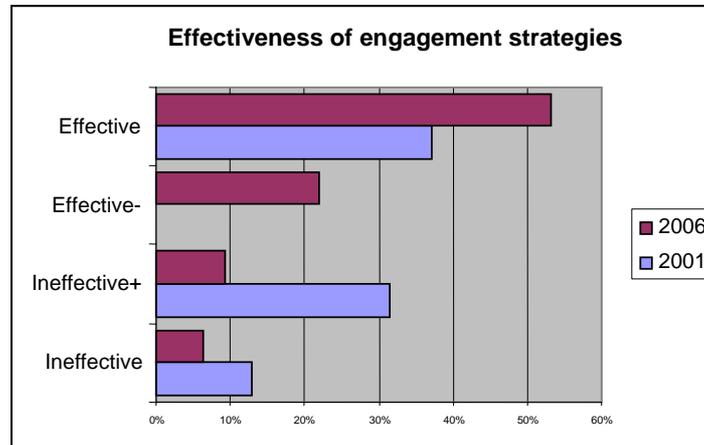
Figure 5.8. Effectiveness of engagement strategies

Even if an engagement strategy is workable and is able to be carried out as
envisioned, it may not be effective at achieving its aims. Between the two
research rounds the proportion of projects with issues of flawed effectiveness
have more than halved. Again, increase in experience on all sides is likely to
have played a role, as is having professional staff to assist with the process. It
would be good to have a better understanding of which methods were effective
for which purpose, but that is beyond the scope of this study.

5.2   Analysis of researchers' responses

The rest of this section relates to information in the results section of this report which comes from researcher interview responses.

Were the stakeholders engaged?

Researchers responded differently to the questions, 'Who were your stakeholders?' and 'Who did you engage?' The main difference was that they gave more detail in answer to the second question, for example, naming particular government departments instead of 'state agencies' or naming specific non-government organisations (NGOs). They frequently thought of groups that hadn't been originally included as stakeholders. Occasionally, the list of stakeholders included sectors that weren't engaged. This may have been partly due to issues of accessibility. For example, politicians or industries might have been seen as stakeholders, but wouldn't have prioritised being involved in the research themselves. In both cases the stakeholders included, roughly in order of frequency, state government, regional NRM bodies and community groups, local government, national/federal organisations, industry and external researchers.

Disadvantaged groups

About 60% of projects were accessible to some disadvantaged sector of society. The largest proportion of these included women, Indigenous people and the elderly. The next largest cluster (around 20%) included remote people, children and non-English speakers.

Inclusion of women did not mean merely that women were included (that is, a 'yes/no' scenario, with no quantitative indication of the number of women included), but that the gender balance was good at least in parts of the stakeholder representation. Of the 36 interviews conducted, ten respondents (28%) were women; two of these were stakeholders; two were at more senior levels (one of these in two roles); and four were at more junior levels. Only one was a project leader. Of the 26 men interviewed, five were at more senior levels. The current study was conducted by four women, with the writing being shared between a man and a woman.

The proportions of projects including disadvantaged groups could not be compared with Round 1 research because in Round 1 some of the information was collected from proposals and this question was not adequately addressed in

proposals. Most projects did not explicitly target disadvantaged groups, and the most targeted stakeholders were employees of government and NGOs which would not on average tend to have a high proportion of these groups. Their representation tended to be the extent to which they came to general community consultations, which have ended up being a smaller proportion of the engagement than was originally expected. The exception was Indigenous representatives, who were explicitly and successfully targeted in a number of projects.

Mechanisms for including stakeholders

Researchers had lots of meetings with stakeholders. Especially notable are the number and proportion of the use of two-way means of communication such as workshops, email, telephone and interviews. These were usually ongoing throughout the research, ensuring that research stayed in touch with needs. Informal meetings were also important which were facilitated by the long-term building of relationships and being accessible to stakeholders by spending time in their area and at activities in which they were involved.

Going to stakeholders—attending meetings of their organisations—was an important way of maintaining contact. The role of the CRC in organising workshops, stakeholder forums at the catchment and national level and in supporting communications made an important contribution. Electronic media (generally email for staying in touch and organising, and web sites for sharing information) have become indispensable. Traditional academic publications and conference presentations are still regarded as necessary, but no longer sufficient. The use of think tanks was another engagement method.

Enabling factors

The CRC making stakeholders a priority, creating an atmosphere where engagement was important, doing a lot of the work and supporting the processes all helped to create a pro-engagement organisation. Restructuring to enable accessibility of research prioritisation to stakeholders in Round 2 was another important factor. The establishment of the regional bodies during this time frame also helped. Having built relationships with key people over time and having relevant and valuable research to offer sustained interest were major contributors. This was ensured by including potential users from the start and encouraging their ongoing involvement throughout the research development process. Explicitly including this adaptive management approach to research

was another factor that enhanced the responsiveness of the CRC's research to its stakeholders.

Ensuring adequate resources for engagement, and being able to secure additional resources as required was important. Stakeholders would often come to the party with additional resources, as they had ownership of the research. Stakeholder engagement is highly resource-intensive; some researchers estimated 20–30% of the budget and time needs to be allowed for this purpose, though they suggested it could be something of a bottomless pit if allowed to be. Knowing this in advance would allow for better planning and perhaps allocation of specialists on research teams to work with stakeholders.

Having the experience and expertise to engage well certainly helps, as does the commitment to and perseverance with the process. Researchers repeatedly said that involving stakeholders was simply an essential component of research. Research organisations can certainly help with these aspects. They can also be a part of creating networks with key organisations that can provide access to the people with relevant interests.

Engagement constraints

Time limitation was by far the biggest factor in constraining research. Usually researchers did not begrudge the time but had only discovered the extent of the time demands during the research. They also felt torn between this and their core research, for which there is much better professional recognition. The time required was exacerbated by the distances between researchers and their stakeholders. This poses possible solutions of having a research team member located at the study site (and having team tele-meetings); researchers travelling to engage; stakeholders travelling to engage; or engagement at a distance. These options could be considered and costed in research planning. Having a local researcher allows the additional benefit of including someone who has specialist engagement skills.

Stakeholders are sometimes disinterested. There is the question of whether research should be conducted if it is without stakeholder interest, but many researchers say they have found out from experience that the stakeholder is not always right. Sometimes public interest research can be crucially important but stakeholders can be "self-interested, short-sighted, mistrustful or just wrong". It can take dogged perseverance on the part of lone researchers pursue the research to the stage where stakeholders can finally see the benefit.

Interactions with stakeholders can also be very difficult. They may have their own political agenda and this can be disruptive. It takes time and 'thick skins' to work through and overcome these issues. Sometimes it is useful to have back-up study sites in case stakeholders pull the plug. Also stakeholders are often less focussed on the research topic, which of course can broaden research, but also takes time and can be a distraction.

Back-up plans are also useful to have in the event that key researchers or stakeholders leave. Succession planning should mean that outcomes are not dependent on any one person and there are sufficient people familiar with the work on both sides that it can continue without the main players. Research was disrupted during the life of the CRC by the leaving of researchers and/or stakeholders and by the restructuring of researcher and stakeholder organisations.

Not everyone felt adequately resourced, and time in particular ran out at the end of the CRC term. This is likely to be mainly because projects overran, partly due to underestimating the time and money needed for engagement, and the time taken for project approvals.

What would work better?

Researchers were expected to conduct a stakeholder analysis and follow stakeholder analysis guidelines as part of their Round 2 project development process, but it may be that this happened only to a limited extent. One of the consistent messages was that a better stakeholder analysis would have helped with the engagement process. Since this was expected by CRC management, it seems likely that researchers didn't fully appreciate the value of this until they ran into problems during the projects, and so did not fully comply with this expectation.

One explanation for this might be that stakeholder analysis, though not inherently difficult, is outside of most researchers' specialty and experience, and is 'deprioritised' as too hard or irrelevant. An approach that could improve this would be to allocate some time of experienced social researchers to go through a stakeholder analysis process with projects as a first step in the development process. If lack of motivation is the problem then giving researchers assisted experience and demonstrating the benefits of better analysis could help. This could sometimes be achieved by including small pilot projects into the start of projects so they start the main project with some existing experience.

The distinction between research and consultancy, and who has control, needs clear discussion in the early stages. Seeing the research through to implementation (on the part of researchers and research organisations) would also improve stakeholder commitment and instil greater trust in researchers.

Structuring the CRC's work around themes in Round 1 and around catchments in Round 2 made the definition of 'projects' somewhat confused to researchers. Time was inefficiently spit, outputs not always well integrated, the view too short-term and with insufficient policy focus. These problems were less pronounced in Round 2 and this was partly helped by the application of adaptive management, though researchers acknowledged they weren't always able to adapt and felt CRC management was sometimes a factor.

Allowing adequate time and ensuring timing compatibility with stakeholder time frames would be beneficial. This has been a learning process for all concerned and warrants documenting in more detail. It is human nature to deal with more urgent things first, and CRC research may have suffered from this tendency. But stakeholder support is crucial and it just takes time to build. All those involved in CRC research say they are left with a better appreciation of this issue.

Benefits of engagement

The main message about the benefits of engaging is that researchers now see it as essential to their research—they simply would not achieve what they had without it. But another major consideration was that many of the researchers acquired resources for their research through stakeholders, often direct funding and creation of new projects. It would be valuable to quantify this, as on this conservative measure of the benefits of engagement alone, it was highly valuable.

The networks researchers built through their stakeholders improved the whole process, but in particular, relevance was ensured and implementation was much more effective. Engagement was also valuable for building skills on both sides, particularly communications skills for the researchers. It was more satisfying for researchers to see their work being used and appreciated. It would now be very difficult for them to go back to working without stakeholder involvement.

Disadvantages of engagement

Researchers often found themselves short of time and other resources, with engagement being very resource-intensive. It also created demand that could not always be met and occasionally got bogged down because of a clash of

interests, sometimes resulting in researchers being on the receiving end of stakeholder anger. Overall, though, these were considered a standard part of the process, and well worth persevering for the benefits that flowed when resolutions were achieved and stronger relationships were forged.

Cost–benefit equity

Researchers were able to see many benefits of their research, but it came less naturally to see cost implications: they identified twice as many benefits as costs. This may be the case, but it seems likely that there are considerable cost implications to implementing research recommendations, or it would be far easier to get recommendations adopted. This is a skill which is needed by researchers and research funders in order to improve adoption and resource availability in an increasingly market-driven funding environment. Two groups (land and marine managers) were more often identified with costs than benefits. If this is the case, there may be cost barriers to implementation.

Engagement processes—how does the CRC compare?

In the researchers' view, the Coastal CRC had a high level of commitment to its stakeholders and strongly promoted engagement with a diversity of stakeholders compared to other Australian research organisations. The CRC was supportive of engagement processes and the research had a strong end-user focus.

All of this increased in the second half of the CRC's tenure. The refocus on catchment-centred research together with their stakeholders from the point of problem identification created a whole-of-research approach that was stakeholder inclusive.

Requiring projects to involve stakeholders and checking that this was happening at approval, milestones and review ensured the process continued throughout the research. Although all of this was at a high level by Australian standards, several of the researchers pointed out that the level was generally higher overseas.

The research funding process

Traditional research funding takes a hands-off approach. It picks the best projects, funds them and gives them a tick at the end for completion. Funding organisations are generally small, with staff mainly skilled in administration and biophysical science research. It is difficult to ensure that research is very

engaged when it is funded in this way, particularly during a transition period when trying to effect a change in the engagement culture of research.

Figure 5.9 compares the typical stages involved in traditional research funding processes with those that might be included in a funding model that actively encourages engaged research.

**Typical research
funding process**

**Possible engaged
research funding model**

```
┌─────────────────┐                    ┌──────────────────┐
│  Call for EOIs  │                    │ Identify general │
└─────────────────┘                    │ problem area with or │
        │                              │ by key stakeholders │
┌─────────────────┐                    └──────────────────┘
│     Review      │                            │
└─────────────────┘                    ┌──────────────────┐
        │                              │  Apply for EOI   │
┌─────────────────┐                    │ with stakeholder │
│  Invite full    │                    │    analysis      │
│  applications   │                    └──────────────────┘
└─────────────────┘                            │
        │                              ┌──────────────────┐
┌─────────────────┐                    │     Review       │
│     Review      │                    └──────────────────┘
└─────────────────┘                            │
        │                              ┌──────────────────┐
┌─────────────────┐                    │  Initial funding for │
│     Grants      │                    │  development of full │
│   allocated     │                    │  applications with   │
└─────────────────┘                    │    stakeholders      │
        │                              └──────────────────┘
┌─────────────────┐                            │
│      1st        │                    ┌──────────────────┐
│    payment      │                    │ Review of research │
└─────────────────┘                    │ and communications │   Maintain
        │                              │ plan with stakeholders │  flexibility
┌─────────────────┐                    └──────────────────┘
│   Milestone     │                            │
│    payment      │                    ┌──────────────────┐
└─────────────────┘                    │     Grants       │
        │                              │   allocated      │
┌─────────────────┐                    └──────────────────┘
│     Final       │                            │
│    report       │                    ┌──────────────────┐
└─────────────────┘                    │ Payment on research │
        │                              │ and communications  │
┌─────────────────┐                    │    milestones       │
│     Final       │                    └──────────────────┘
│    payment      │                            │
└─────────────────┘                    ┌──────────────────┐
        ↓                              │ Final report on  │
                                       │ implementation and │
                                       │ evaluation process │
                                       │ with stakeholders  │
                                       └──────────────────┘
                                               │
                                       ┌──────────────────┐
                                       │     Final        │
                                       │    payment       │
                                       └──────────────────┘
                                               ↓
```

**Figure 5.9. Typical stages of the traditional research funding process compared with possible
stages of an engaged research funding model**

If an engaged research funding model were to be applied, scientists wouldn't initially have all the skills or motivation for truly engaged research. In order to make it happen, funding organisations need to have checks in place at each step of the way to ensure that engagement happens and they should have the capacity to support this with skilled staff. There also needs to be direct interaction between the funding body and stakeholders for review processes and networking roles.

This makes the funding aspect a larger part of the process than is currently typical. There are cost and time implications for the research process, but this will be more than compensated for by having the implementation of research built into the process, with no need to go and do the typical hard sell of the dissemination phase. There will be considerable cost savings in the reduction of unused or underutilised research. There will also be sources of additional resourcing through the partnerships forged by this process.

CRCs have been in a unique position to adopt these sorts of practices. One down side of CRCs is that innovative organisations and processes have considerable time overheads in setting up and in the learning processes on all sides—management, researchers and stakeholders—and a CRC's lifespan is usually limited. It would be beneficial if conventional research organisations took up some of the approaches applied in CRCs.

5.3   Additional research

Several unanswered questions have come out of this study. This investigation was carried out primarily from a researcher perspective, but another, equally important perspective is that of the stakeholders. It would be useful to formally investigate those views, particularly the sectors that were less readily engaged.

Since planning the time needed for engagement was the most consistent problem it would be useful to look at that issue in more detail, in particular to develop a clear understanding of the amount of time usually needed and the variability and causes of variability. This would provide for better research planning and funding.

It would be helpful to quantify the resources that flow from effective stakeholder engagement, particularly additional research funding. This would be useful in planning and in justifying stakeholder engagement.

The current study did not have the scope to look at the effectiveness of individual engagement practices. This would be a useful contribution, in particular in developing guidelines about which activities are most useful for which purposes and in which contexts.

References

Abal, E.G., Dennison, W.C. & Greenfield, P.F. (2001) Managing the Brisbane River and Moreton Bay: An integrated research/management program to reduce impacts on an Australian estuary, *Water Science and Technology*, 43(9), 57–70.

Bland, C.J. & Ruffin, M.T. (1992) Characteristics of a productive research environment: Literature review, *Academic Medicine*, 67(6), 385–397.

Blumenthal, D, Campbell, E.G., Causino, N. & Louis, K.S. (1996) Participation of life science faculty in research relationships with industry, *New England Journal of Medicine,* 335(23), 1734–1739.

Coastal CRC (2003) (last updated 2005). *Citizen science.* Coastal CRC. Available online: <http://www.coastal.crc.org.au/citizen_science/>.

Coastal CRC (unpublished internal management document) *Guidelines for developing activities: Subprojects and regional projects.*

Coastal CRC (unpublished internal management document) *Phase 2 project development.*

Coastal CRC (unpublished internal management document) *Process for reviewing milestones and deliverables.*

Coastal CRC (unpublished internal management document) P*roject advisory group: Draft guidelines.*

Coastal CRC (unpublished internal management document) *Terms of reference, industrial catchments: Port Curtis Advisory Group 2003–2006.*

Davenport, S., Leitch, S. & Rip, A. (2003) The 'user' in research funding negotiation processes. *Science and Public Policy*, 30(4), 239–250.

Eisner, R (2001) *Enhanced process for community participation*. Unpublished report, Cooperative Research Centre for Coastal Zone, Estuary and Waterway Management, Brisbane.

Gass, G., Biggs, S. & Kelly, A. (1997) Stakeholders, science and decision-making for poverty-focused rural mechanization research and development, *World Development*, 25(1), 115–126.

Guerin L.J. & Guerin T.F. (1994) Constraints to the adoption of innovations in agricultural research and environmental management: A review, *Australian Journal of Experimental Agriculture*, 34, 549–71.

Johnson, N., Ravnborg, H.M., Westermann, O. & Probst, K. (2001) User participation in watershed management and research, *Water Policy,* 3(6), 507–520.

Kaplan, I.M. & McCay, B.J. (2004) Cooperative research, co-management and the social dimension of fisheries science and management, *Marine Policy*, 28(3), 257–258.

Kyung, M.K. (2005) Enriching the process of 'good science' through participation of people with psychiatric disabilities in all aspects of research. *Psychiatric Rehabilitation Journal,* 28(4), 403–406.

Naylor, P-J., Wharf-Higgins, J., Blair, L., Green, L. & O'Connor, B. (2002) Evaluating the participatory process in a community-based heart health project, *Social Science & Medicine,* 55, 1173–1187.

NRDC (National Research and Development Centre) for Adult Literacy and Numeracy (2002) *Strategy 2003–2007: Generating knowledge and transforming it into practice.* NRDC. Available online: <www.nrdc.org.uk/uploads/documents/doc_2778.pdf>.

O'Connor, R.E., Anderson, P.J., Fisher, A., & Bord, R.J. (2000) Stakeholder involvement in climate assessment: Bridging the gap between scientific research and the public. *Climate Research*, 14(3), Special Issue No. 7, 2 May, 255–260.

Oliver, P. (2005) *Practical tools and strategies for stakeholder engagement – CRCs and community groups.* Available online at <http://www.crca.asn.au/activities/2005/conference/presentations/OliverPeter_Stakeholder_Eng.pdf>.

Shavers-Hornaday, V.L., Lynch, C.F., Burmeister, L.F. & Torner, J.C. (1997) Why are African Americans under-represented in medical research studies? Impediments to participation. *Ethnicity and Health*, 2(1-2), 31–45.

Simpson, B. (2004) After the reforms: How have public science research organisations changed? *R&D Management*, 34(3), 253–266.

Vanclay, F. & Lawrence, G. (1998) Agricultural extension in the context of environmental degradation, *Rural Society,* 5,(1), 20.

Appendix 1: Coastal CRC report card

Stakeholder engagement in research, 2006 vs. 2001

The graphs presented below reflect the opinions of Coastal CRC researchers surveyed in the closing stages of the CRC's seven-year period of operation.

Who did researchers engage with?

Intentionality of engagement

Flexibility to adapt to stakeholder needs

How workable was the engagement process

Incorporation of knowledge systems

Effectiveness of the engagement

Stakeholder engagement in research stages

Responsibility-sharing with stakeholders
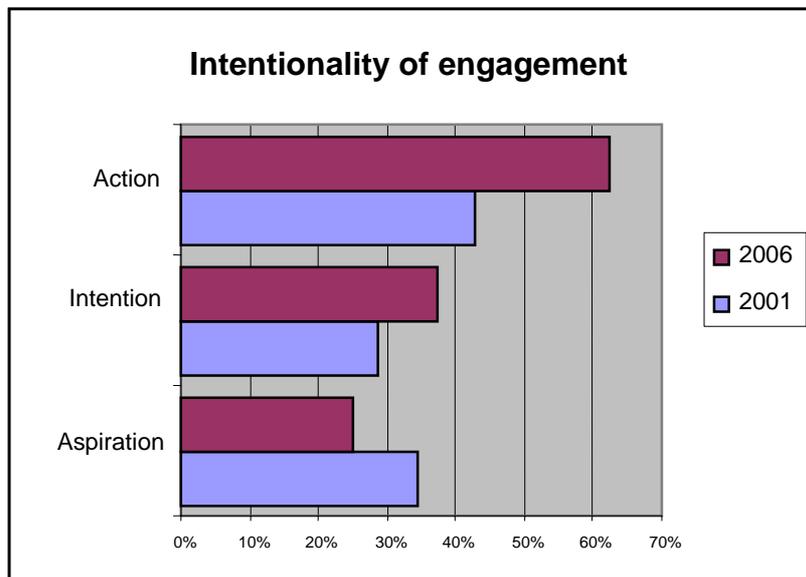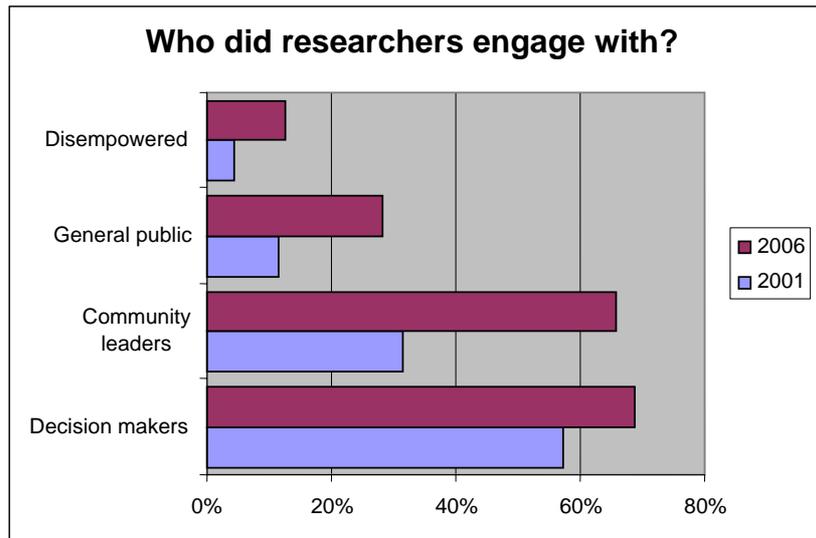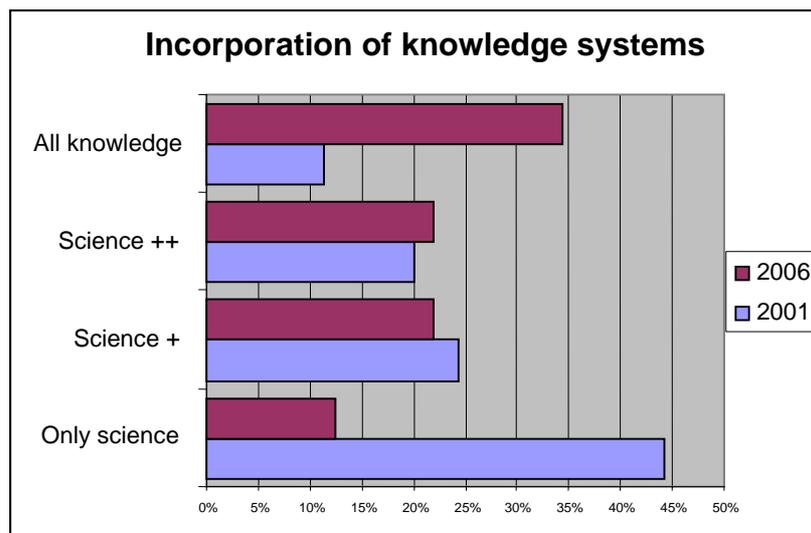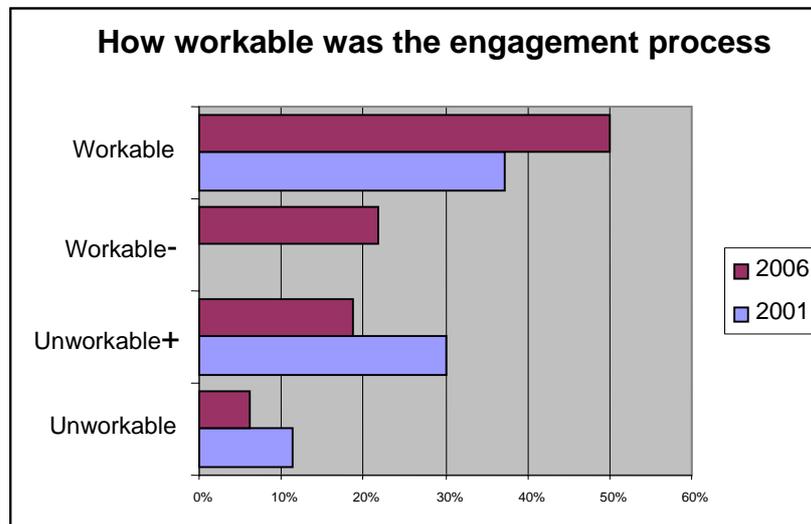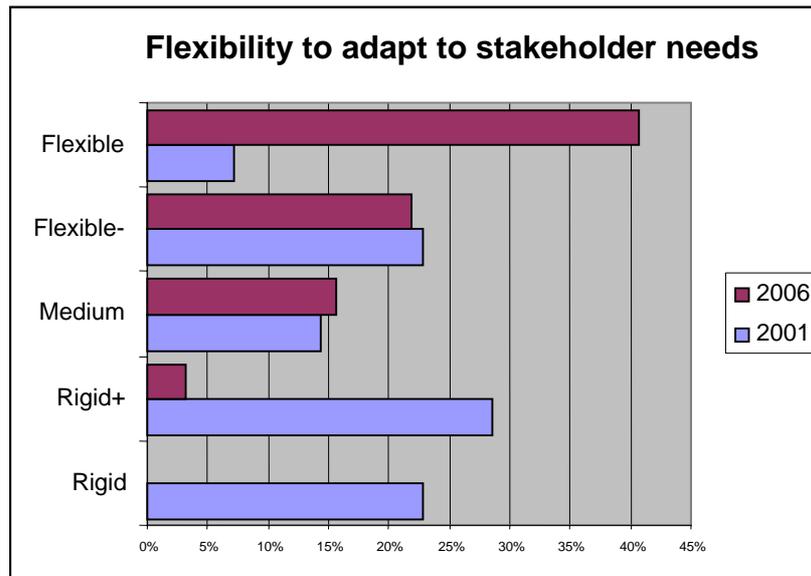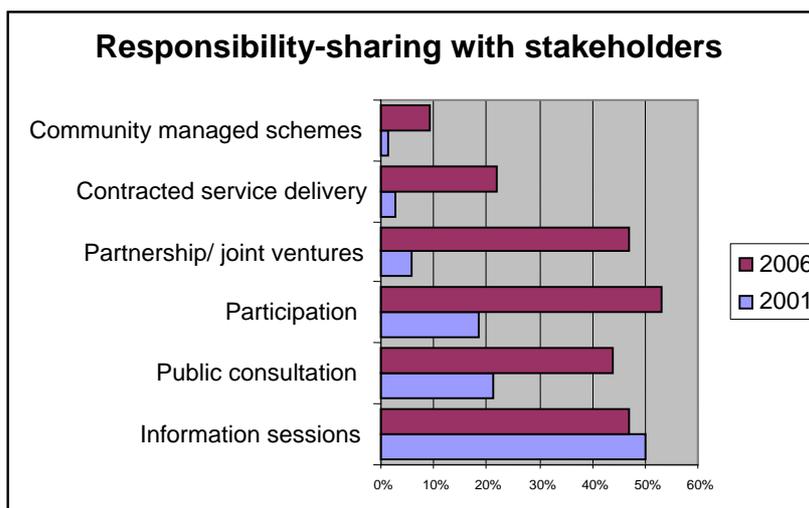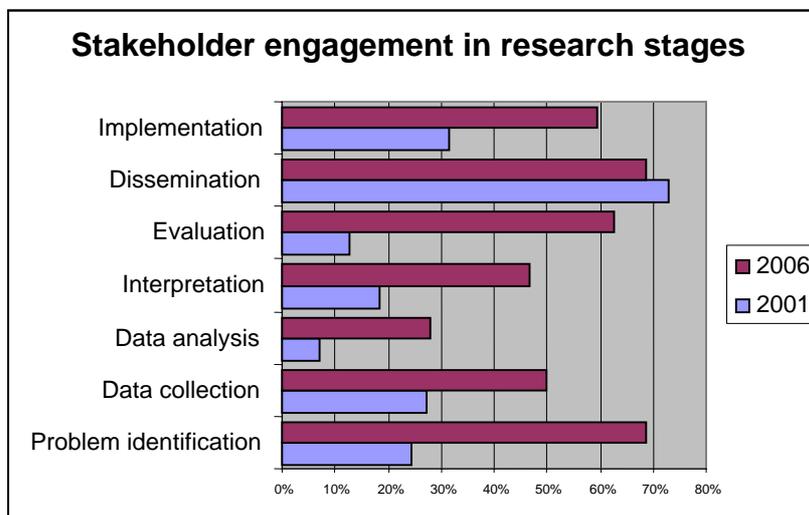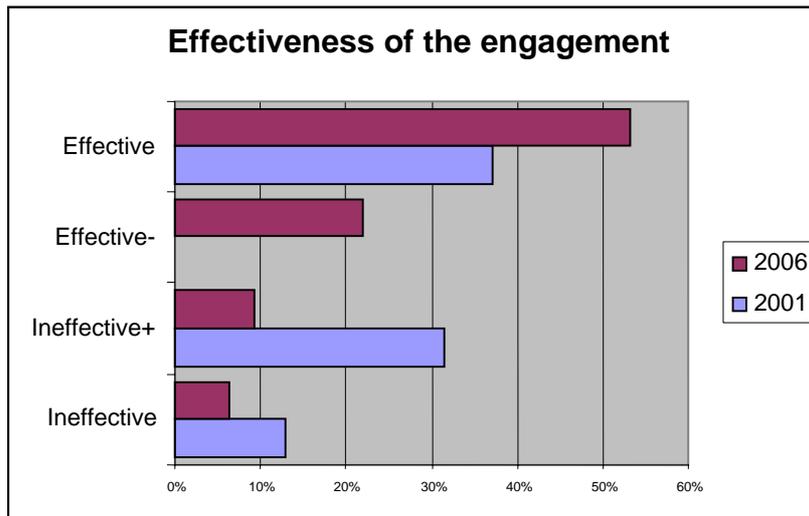
Appendix 2: Engaged research checklists for funders, stakeholders and researchers

The following suggested checklists for engaged research are compiled largely from a researcher perspective, with some input from stakeholders and Coastal CRC management. They are offered after nearly seven years of experience with engaged research in the Coastal CRC.

(1)   Checklist for research funders

- Show leadership by
  - Strong advocacy of stakeholder engagement
  - Modelling of processes through engagement of organisation's stakeholders
  - Support for the process within research projects

- Specify the stakeholder engagement required within projects in
  - The proposal guidelines
    - Include requirement for brief stakeholder analysis prioritising those with
      - capacity to use or contribute to the research
      - decision-making power to influence adoption
      - resources to fund new research
  - The project agreement guidelines
    - Include requirement for an engagement and communications (E&C) plan
    - Consider building small pilot study into the first few months of the project to give researchers a trial run at all project components
    - Agreement review process should include key stakeholders
    - Check appropriateness of engagement level against decision tree such as that shown in Appendix 6
  - The milestone review process
    - Milestones should include key points in the E&C plan
    - Incorporate flexibility to adapt to changing stakeholder needs as the research progresses
  - Set up stakeholder advisory groups by interest area or location to advise across the research program to inform the funding organisation and provide networking support to researchers

- Support the engagement process by
  - Assisting researchers in engaging stakeholders though
    - Guidelines on how to conduct a stakeholders analysis and creating an E&C plan
    - Advice on how to go about engagement processes
    - Networking with key groups
    - Adequately resourcing the process (say, 20–30%)
    - Allowing sufficient time for the process
  - Assisting with communication processes by engaging professional communicators and web designers

(2)   Checklist for stakeholders

- Negotiate
  - How much of a say you'll have in the research
    - If you want to have all the say you may have to pay for the research
  - How much of your time it will take
  - What you can expect to get out of it

- Have a plan for if the people involved need to change
- Think out what's going to happen when the research is over

(3)   Checklist for researchers

Stakeholders
- Include a brief stakeholder analysis prioritising those with
    - capacity to use or contribute to the research
    - decision-making power to influence adoption
    - resources to fund new research.
- Consider the costs and benefits of your research—who will bear the cost burden of implementation? This must be addressed or will cause problems for adoption
- Be a networker—ask the funding body for help
- If this research should be inclusive of disadvantaged groups, target them explicitly
- Build long-term stakeholder relations
- Make sure key stakeholders are on board from the start—it will be much harder to bring them in later
- Keep in touch
- Think 'end user' for your deliverables

Pilot
- You may be a very experienced researcher, but you haven't conducted this research before. To cut down on things that might go wrong and develop familiarity, build a small pilot into the early stages of the research

Level of engagement
- How much to engage? Check plan against decision tree such as in Appendix 6
- Give stakeholders a say—but clearly negotiate how much, to avoid unmeetable expectations
- Be clear about limits of what stakeholders can expect in terms of outcomes
- If stakeholders want more they may pay for it—it doesn't hurt to ask

Problems
- Be aware that it may take perseverance and putting up with 'politics'—it's worth it
- Stakeholders are not always right, but neither are researchers; be open-minded in seeking common ground
- Ask for help if it gets too much

Engagement plans
- Include an engagement plan in your project proposal
- Include the key steps in your project milestones
- Plan timeframes with stakeholders—study site may have to change if too incompatible
- Flexibility is needed to stay on track with stakeholders—an adaptive management approach is useful, learning as you go
- Plan for researcher and stakeholder succession or it could fall in a heap if someone leaves
- Can you ensure the outcomes of the research carry on once the research is over

Manage distances
- Plan around events when people are together anyway
- Consider having a local person with good people skills on the team
- Coordinate with other related projects to capitalise on opportunities for synergy and to avoid duplication and creating stakeholder fatigue

Got what you need?
- Allow enough time and enough of the budget (try 20–30%, although it can vary widely due to unforeseen events)
- Plan the budget for engagement or it could cost too much
- Plan for the support needed

Appendix 3: Questionnaires used in this study

(a)   Questionnaire sent to researchers
(b)   Questionnaire for stakeholders
(c)   Questionnaire for CRC management

(a)   Researcher questionnaire:
Stakeholder participation in Coastal CRC research

Interviewee:	Subproject:

In 2001 the Coastal CRC conducted a study (DF2) into the stakeholder participation in the research projects that had been approved up to that point (Round 1). This study is looking at the research conducted in Round 2, to examine the changes in the use of participatory methods over the life of the Coastal CRC.

This is an opportunity to reflect on your experiences with participatory research methods, and the CRC's role in the use of these methods. The results will be part of the CRC's review process and will be included in a publication of outcomes from the CRC.

This should take about 40–50 minutes, so that only gives us about two minutes a question, just to give you an idea of how much detail to go into.

Questions and classifications

1.0 Context

1.1) What was your role in the research? (e.g. sole researcher, leader of a multidisciplinary team of 6, leader with most of the research being conducted by others, member of research team, stakeholder)

2.0 Roles of engagement

2.1a) Who do you see as the stakeholders in your research?

b) Who was actually engaged with in the project?
   —*Not specific names, but the types of organisation and their role within it.*

Please indicate which of these categories of stakeholders were involved	**People with the decision-making power in society**	**Community leaders**	**The general public**	**People who don't normally have a say**

c) Were any of the following groups able to get involved?

non-English speakers	ethnic groups	elderly
Indigenous	women	remote
children	disabled	illiterate

2.2) Can you tell me about any ways stakeholders were included in your research? (e.g. meetings, workshops, document review, information sessions, email exchange)

2.3) What responsibility for research directions and methods, if any, did stakeholders have in your research?

Please indicate which of these categories of engagement methods were involved

Information sessions (one-way info flow)	**Public consultation (two-way)**	**Participation (negotiation)**	**Partnership/ joint ventures (shared responsibility)**	**Contracted service delivery (e.g. brokerage arrangements)**	**Community managed schemes (autonomy within approved framework)**

2.4) What was the stakeholder involvement in the different research stages?

Problem identification	
Data collection	
Data analysis	
Interpretation	
Dissemination	
Implementation	
Evaluation	

2.5 a) Initially, what were the perceived needs this research would address?

    b) How did you check these perceptions with stakeholders, and that the planned research would address these needs?

Please indicate which of these categories apply

Usefulness hoped for	Plans to ensure usefulness	Ensured usefulness

3.0 Bridges and barriers

3.1 a) What factors enabled you to carry out the stakeholder engagement in your research?

    b) What practical difficulties did you experience in engaging stakeholders?
      —Were you able to engage as you had originally envisioned, or did things change?

On the following scale, please indicate (in practical terms) how workable were the engagement methods in your project?

Unworkable		Workable

    c) What would improve stakeholder participation in the future?

3.2 a) How effective at achieving the stated aims were the methods of engaging of stakeholders used in your project?

How would you rate this effectiveness on the following scale?

Ineffective		Effective

    b) What were the benefits (especially outcomes) and disadvantages of engaging with stakeholders?

3.3) How were you able to incorporate different types of knowledge into your research?
    (e.g. traditions, local knowledge, personal experience, living memory, anecdotes, rumours, media stories, beliefs, attitudes, fads/fashions, lobby group positions)

How would this rate on the following scale?

Only science			Incorporating all forms of knowledge

3.4) How were you able to adapt as you went along in order to engage with stakeholders?

How would you rate this on the following scale?

Rigid				**Flexible**

4.0 Reflections

4.1 a) Who do you think will benefit from your research?

   b) Will there be costs to anyone? Whom?

4.2) How was the input of different disciplines integrated in your research?
   —Can we follow up on this? Who else would be able to tell us more about this?

4.3) Who else from your project would we need to talk to find out what else happened with stakeholder engagement?

4.4) In what ways was your experience of participatory methods in CRC projects different from your other research projects

If you were involved in Round 1 projects:

4.5) How has stakeholder involvement in CRC research changed since Round 1?

4.6) What influenced these changes?

(b) Stakeholder questionnaire:
Stakeholder participation in Coastal CRC research

1) How did you become involved in Coastal CRC research?

2) What was your motivation to be involved?

3) What were the benefits of your involvement? How did it influence what the CRC did?

4) What about disadvantages?

5) What was difficult about the way the CRC engaged with you?

6) If we were doing this again, what would be better to do next time?

7) How could the role/functioning of the National Stakeholder Advisory Committee (NSAC) be improved?

8) What changed about stakeholder engagement between Round 1 and Round 2 of the CRC, and what do you think accounts for any changes?

9) How does working with the CRC compare to working with other organisations, and what accounts for any differences?

10) Any other comments or suggestions?

(c) Coastal CRC management questionnaire:
Stakeholder participation in Coastal CRC research

1a) How did the project approval process work in Round 1?

   b) Were stakeholder engagement methods within projects part of this process?

   c) What was different about this in Round 2?

   d) What were the main differences that might have influenced engagement processes within projects?

   e) A checklist was reportedly used with project leaders for assessing their proposals. What was in this that related to stakeholders?

2) How did the project review process work? How was stakeholder engagement factored in?

3a) What was the board's role?

   b) Partners with financial interests in the CRC were on the on board. How were stakeholder interests balanced with this?

   c) What was the National Stakeholder Advisory Committee's role?

4a) What did the CRC do to support engagement in projects during Round 1?

   b) And in Round 2?

   c) There was a special role for the Fitzroy Basin Association and Moreton Bay Partnerships in Round 1. How did that go? What happened in Port Curtis?

5) Is there anything else we should be asking?

6a) How do you perceive engagement has changed in the CRC?

   b) What do you think accounts for any change in engagement?

Should we be looking at engagement at all levels or just within projects?

What information has been sent to CRC researchers about this study?

Appendix 4: CRC subprojects and their inclusion in this study

Subproject code	Title	Number of respondents
A0	Towards cooperative, adaptive and sustainable management of the Fitzroy coastal region	1
AC	Contaminants dynamics	2
AW	Floodplain wetlands	1
CO CT	Coastal water habitat mapping Toolkit of techniques and interpretation	3
CB	Benthic biology and habitat classification	1
CG	Coastal geomorphology and classification	1
Client-focussed projects	Wetlands and national program Fitzroy program	1 1
IC	Contaminant pathways	1
IGAG	Governance and partnerships	3
IW	Intertidal wetlands x 2	1
PC and SEQ	Port Curtis, south-east Queensland	1
SC	Models for tidal entrance /open coast interaction	1
SD	Monitoring and modelling for management	1
SG	Enabling adaptive management	3
DF	Decision frameworks	1
SK	Knowledge integration and exchange	1
CQIP	Central Queensland information paper	2
SE	Estuarine geomorphology	1
SO	Science to enable adaptive management for sustainability	1
SP	Environmental planning x 2	1
SR	Remote sensing	1
UB	Benthic habitat and nutrient processing	1
UG01	Dialogue and knowledge exchange	1
UWA	Coastal wetlands in urbanised SEQ	2
UWB	Wetlands riparian denitrification	1
MEWG	Coastal indicators	1
Not covered		
AF	Environmental flows	0
	Total	**36**

Appendix 5. Stakeholder engagement requirements in CRC management documents

The documents incorporating this information are unpublished internal CRC management documents identified by name in the reference listing.

Project guidelines
- Focus areas were developed with stakeholders
- Regional projects were to be developed with stakeholders
- Subproject outlines also developed with subproject-specific stakeholders
- Research team should include stakeholders
- Communications to be included in milestones
- Knowledge exchange included in milestones

Project agreement guidelines
- Require a section outlining proposed stakeholder involvement
- Need to adopt an adaptive management framework
- Need to demonstrate significant stakeholder involvement
- Need to demonstrate stakeholder support for ongoing funding
- Requires subprojects to contain stakeholder analysis including planned involvement of:
    - stakeholders
    - agencies
    - industry
    - community
- States that stakeholder involvement is a 'key principle' for subprojects
- States that subprojects will facilitate stakeholder involvement through
    - joint activities
    - a project advisory group
    - other means
- Example outcomes, milestones and deliverables are stakeholder-oriented
- Consider risks to stakeholders of projects not proceeding
- Requires communication plan in 1st year outlining
    - How it will bridge gaps between science and the community, policy-makers, planners and decision-makers
    - how stakeholders are to be engaged
    - use of media, events
    - target audiences, relevance to them
    - setting performance indicators for the communication strategy
    - getting help from CRC's communication manager including:
        - guidelines for workshops
        - guidelines for stakeholder analysis
    - tangible milestones
- Changes to deliverables negotiated with the CEO and stakeholders

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Process for reviewing milestones and deliverables
This involved a checklist that included:
- planning consultations around annual meetings of stakeholder groups
- sufficiency of communications products
- adequate funding for communications
- sufficient time for communications

Advisory groups (Coastal CRC, 2003)
The advisory groups had no delegated authority, but were constituted to provide input to the research in their areas of knowledge including:

- relevance
- local issues
- awareness-raising
- local networking
- outcomes
- monitoring and evaluation
- dissemination
- communication
- feeding back from networks
- implementation
- interpretation

Project Advisory Group – Draft Guidelines[7]

- To advise on project objectives and outcomes to ensure relevance and timely responses to local issues and stakeholders
- To advise of, and assist in coordination of, activities which increase awareness and understanding of coastal issues within the region
- To encourage a positive environment that promotes co-learning for sustainability and project outcomes and links with regional communication networks
- To advise and assist project staff in the planning, communication and implementation of the project outcomes
- To assist in the monitoring and evaluation of project activities in response to the needs and events within the region, the community and institutions
- To inform and advise the regional community (through regional stakeholder committees and groups) on the project outcomes and communicate feedback to the project manager
- To receive and address any concerns raised by stakeholders and items of concern raised by stakeholders in the region
- To assist in bridging the gaps between science and the community and science and effective communication and implementation and adaptive actions
- To participate in the interpretations of the project results and assist the project team with the integration of the information as well as to inform regional decision-making

Appendix 6: Engagement decision tree (Oliver, 2005)

Answer these questions in the given order...	... and follow the answers to the appropriate option	For government substitute researcher

As a government officer:

1. Does government have all that is needed to solve the NRM problem working alone?

no — yes

2. Are the potential options to solve the NRM problem limited and already defined?

no — yes

3. Is acceptance by citizens critical for effective implementation of any decisions made to solve the NRM problem?

no yes no yes yes no

4. If citizen acceptance is necessary, is this outcome reasonably likely if government alone makes decisions about actions to be taken?

yes no yes no no yes

option A   option B

5. Are relevant stakeholders (citizens and government) willing to engage each other in dialogue in order to solve the NRM problem?

no yes

6. Would the quality of stakeholder (citizens' and government) input or future relations be improved if social learning occurs among them about issues related to solving the NRM problem?

no yes yes no no yes

option C option D

7. Are relevant stakeholders (citizens and government) willing to take collective action to implement any decisions that may be made to solve the NRM problem?

yes no no yes no yes no yes

option E option F option G option H

8. Are relevant stakeholders (citizens and govt) prepared to share power and responsibility for decision-making and actions that may be taken to solve the NRM problem?

yes no no yes no yes no yes

option I option J option K option L option M option N option O option P

Option	Citizen participation outcome	Description of citizen participation outcome
A	Information	Government decides; informs citizens: government acts
B	Information	Government decides; informs citizens: government acts
C	Targeted consultation	Consultation with citizens directly affected; government decides; informs citizens: government acts
D	Targeted consultation with social learning	Consultation & social learning with citizens directly affected; govt decides; informs citizens & acts
E	Targeted consultation with social learning	Consultation & social learning with citizens directly affected; govt decides, informs citizens & acts
F	Targeted consultation	Consultation with citizens directly affected; govt decides, informs citizens & acts
G	Widespread consultation	Widespread citizen consultation; government decides, informs citizens & acts
H	Widespread consultation with social learning	Widespread consultation & social learning with citizens; govt decides; informs citizens & acts
I	Partnership with social learning	Widespread consultation & social learning with citizens; govt & citizens decide together, inform all citizens & act in partnership with citizens, sharing power, responsibility & resources
J	Collaboration with social learning	Widespread consultation & social learning with citizens; government decides, informs citizens, & acts in collaboration with them
K	Collaboration	Widespread citizen consultation; govt decides, informs citizens, & acts in collaboration with them
L	Partnership	Widespread citizen consultation; govt & citizens decide together, inform all citizens & act in partnership, sharing power, responsibility & resources
M	Collaboration	Widespread citizen consultation; govt decides, informs citizens, & acts in collaboration with them
N	Partnership	Widespread citizen consultation; govt and citizens decide together; inform all citizens & act in partnership, sharing power & resources
O	Collaboration with social learning	Widespread consultation & social learning with citizens; gov decides; informs all citizens; and acts in collaboration with them
P	Partnership with social learning	Widespread public consultation; govt & citizens decide together; inform all citizens & act in partnership, sharing power, responsibility & resources

Appendix 7: Abbreviations

CEO	Chief Executive Officer
CIRM	Consortium for Integrated Resource Management
CMA	Catchment Management Authority
Coastal CRC	Cooperative Research Centre for Coastal Zone, Estuary and Waterway Management
CRC	Cooperative Research Centre for Coastal Zone, Estuary and Waterway Management
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DPI&F	Department of Primary Industry and Fisheries
DSTO	Defence Science and Technology Organisation
EPA	Environmental Protection Agency
FBA	Fitzroy Basin Association
FNQ NRM	Far North Queensland Natural Resource Management
FRDC	Fisheries Research and Development Corporation
GBRMPA	Great Barrier Reef Marine Park Authority
HUMDIMNRM	Human Dimensions in Natural Resource Management
MEWG	Monitoring and Evaluation Working Group, CRC group which is developing coastal indicators
NAPSWQ	National Action Plan for Salinity and Water Quality
NEN	the National Estuaries Network
NGO	Non-government organisation
NRM	Natural resource management
NRW	Queensland Department of Natural Resources and Water (previously NRMW, Natural Resources, Mines and Water)
NSAC	National Stakeholder Advisory Committee, a stakeholder group established by the CRC
NSW	New South Wales
PhD	Doctor of Philosophy
RCG	Regional Groups Collective
SEQ	South-east Queensland
WA	Western Australia