From 'dialogue' to 'engagement'?

Learning beyond cases

Cross Case Study Learning Group

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Contract details

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NZ Science and Technology Dialogue Fund Evaluation Project

The research team were contracted by the Ministry of Research, Science and Technology (MoRST) to conduct a participatory evaluation using a multiple case study approach. The focus was not on the detailed monitoring of individual projects, but the development of understandings about dialogue that drew on the work of each of the projects.

The aim of the Dialogue Fund Evaluation Team (later called the Cross Case Study Learning Group) was to produce an analysis that integrated information available from all the project teams. This analysis was directed at providing scientists and other key actors in this field with information that can influence their practice, as well as contributing to international knowledge in this field. The following aims, actions and outputs were identified in the contract with MoRST:

Aims:

1. To identify a framework of ideas, critical questions and processes that can be used by all the projects supported through the Dialogue Fund to evaluate their research.
2. To facilitate robust and appropriate evaluation of all the projects funded through the Dialogue Fund.
3. To facilitate discussion among project teams about their different approaches to achieving dialogue between diverse social actors.
4. To collate information from each of the project teams about their experiments with dialogic processes.

5. To analyse the dialogue strategies used by the project teams in the light of information available about:
    a. Other strategies used in Aotearoa/New Zealand and elsewhere; and
    b. Conceptual work on issues associated with science/community dialogue.
6. To prepare material for the New Zealand science community that presents what has been learned about dialogue processes through the NZ Science and Technology Dialogue Fund and other initiatives directed at two-way communication between scientists and other members of the community.
7. To provide a final report to MoRST on knowledge about different approaches to science and technology dialogue and the complexities of dialogue initiatives.
8. To develop suggestions for areas of future investment in research relating to these initiatives.

ACTIONS:

1. Meetings between the successful applicants to the Dialogue Fund and the Evaluation Team. This will entail discussion of the case study framework, critical questions relevant to that framework and the details of how these questions might inform the evaluations conducted by each of the research teams.
2. The establishment of links between each research team and a member of the Evaluation Team to facilitate discussion (when appropriate) of the projects and the availability of information to the Evaluation Team. (MoRST will be the key contact person for research teams).
3. Regular meetings of the Evaluation Team to review information available from project teams, share relevant literature and prepare preliminary analyses of what is being learned through the projects.
4. A workshop for members of research teams and others researchers working in the field at which dialogue strategies and the thinking informing them is discussed.
5. A final meeting of all project teams and the Evaluation Team at the end of the current period of funding to share insights arising out of the particular projects and analyses that transcend the particulars of each project.
6. The team will keep in regular contact with MoRST and respond to their enquiries about progress on the evaluation.

OUTPUTS:

1. A short document providing a framework for critical analysis of dialogue strategies.
2. A set of common questions that can inform the evaluation strategies of each project group and facilitate comparison across the work of research teams.
3. A report on the projects funded and the different dialogue strategies they will use for distribution to the science community and other interested parties.
4. A review of other research initiatives in this field as a context for analysis of the work of the NZ Science and Technology Dialogue Fund projects.
5. A set of materials for the science community about dialogue initiatives that uses information available from the different teams funded in 2002/03 and 2003/4.
6. A final report that assesses what can be learned through the Dialogue Fund initiatives and considers the project initiatives in the light of national and international literature in the field.

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Executive Summary

The need for science-society dialogue in New Zealand has not arisen in a vacuum, but is an international trend, impacting upon the ways in which scientific research is funded, carried out, and implemented.[1] Science communities, governments using science to inform policy-making, and industries that use science to develop new products and technologies are increasingly subject to questioning by members of the public, either as individual citizens or as members of specific organisations/interest groups.

Improved two-way communication between scientists, technologists and other members of civil society is recognised to improve the relevance and uptake of research results, particularly in areas where there are multiple stakeholders and contested views. There are a number of positive experiences that arise out of flows of information, understanding and debate among scientists, technologists and other citizens. While investment of resources in dialogue initiatives can be seen as occurring at the expense of scientific research, dialogue (especially when it is interpreted as attention to multiple positions on issues) increases transparency in the science process and can advance critical inquiry. Because more viewpoints are involved, there is more potential for new positions on any research problem to emerge. Dialogue to improve understanding among those occupying different positions on controversial issues reduces the level of unproductive conflict. Another driver of dialogue (or 'engagement' among those with a variety of positions on an issue) is the global resurgence of ethnic rights and sovereignty issues for indigenous peoples.

Four very different projects were funded by the Ministry of Research, Science and Technology in 2002/3 and 2003/4 as part of the Ministry's response to international attention to 'the drive for dialogue'. They all used different strategies to engage multiple stakeholders in focused conversations about science and technology issues, and they were all successful. The Ministry of Research, Science and Technology set up an evaluation team to liaise with the Dialogue Fund research teams and consider the overall knowledge about science and society dialogue produced by the projects. This report of the Cross Case Study Learning Group (CCSLG) identifies what was learnt about dialogue strategies across the different projects. It also tries to draw specific lessons for the practice of science in Aotearoa New Zealand.

The Cross Case Study Learning Group set up links between members of the group and the research teams funded through the Dialogue Fund. In some cases this involved observation of the dialogue initiatives pursued by project teams. CCSLG also organised a meeting in February 2004 at which each of the teams presented their preliminary work to the other teams and discussed some of the issues confronting those working in this field (Kilvington et al, 2004). In addition, all the research teams responded to a set of questions from the CCSLG on completion of the projects. This report draws on the final reports as well as interactions with team members to identify

[1] See review for MoRST of national and international initiatives directed at involving the public in science and technology decision-making - Allen et al, 2003.
http://www.morst.govt.nz/?CHANNEL=REVIEW+OF+PROJECTS&PAGE=Review+of+projects

effective strategies for engaging members of the public in discussion and decision-making about science and technology.

The conclusions of the Cross Case Study Learning Group are identified below.

Good dialogue/ public engagement in science and technology discussion and decision-making will:

- Set up opportunities for shifts in individual understandings as well as organisational change
- Build capacity and willingness for further engagement
- Be culturally appropriate for the participants
- Be initiated early in the design of new scientific projects (an 'upstream' vs. a 'downstream' approach to communication among scientists and various publics).

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Factors that contribute to good dialogue/ public engagement are:

- Making people feel welcomed – achieving the generosity associated with the Māori concept of marae
- Putting effort into building relationships before dialogue/engagement occurs
- A structure for engagement that is well defined, but also flexible
- Opportunities for participants to step out of established expectations and ways of doing things
- Sharing of food and informal interaction as well as formal dialogue processes
- Clear expectations of the event
- Providing a safe space/place for interaction
- Getting participants to listen to one another and show that they have attended to what others say
- Developing shared understandings as well as articulating differences
- Conversation at an appropriate level that engages everyone equally
- A continuum of engagement – the opportunities for cumulative interactions
- Clear understandings of what will happen after the dialogue/public engagement event.

The key capacities required to achieve good dialogue are:

- Skilful, structured and independent facilitation of the dialogue event
- Knowledge of Tikanga Māori and Matauranga Māori if scientists and technologists are to interact effectively with Māori participants
- Established relationships with potential dialogue participants – this is particularly important for Maori stakeholders
- Experience in the use of actions and strategies that develop the capacities of the participants to listen, to understand and to engage with one another (this includes scientists, technologists and the relevant communities of interest).

Beyond this, lessons that emerge specifically for science are:

- Tikanga Māori and marae processes cannot be a 'clip on' to events organised around different agendas and understandings about relationships
- Tikanga Māori and marae processes need to be led by those who are skilled in Te Reo and are confident in their knowledge of Tikanga
- Researchers benefit from discussion among themselves about the social, cultural, ethical and spiritual issues associated with their research
- Those initiating dialogue events benefit from debate among themselves about the purposes of these events and the processes that will facilitate good conversations and mutual understanding among participants
- Social scientists should not be used at the end of a research process as advisors on 'how to involve the public' – their knowledge is vital from the beginning of any controversial natural or biological science inquiry
- Interventions that provide opportunities for conversations have to involve follow up activities in the form of feedback to participants and their involvement in defining actions that they would like to achieve as a result of participating in these conversations
- These ongoing activities or actions are the processes through which dialogue between scientists, technologists and other members of the community are built – dialogue events are rarely successful as 'one off' events
- Good science demands quality control and peer review – so do dialogue/ science engagement initiatives.

Positive aspects of public engagement with science and technology:

- Marae based dialogue processes are a building block for dialogue, not just for Māori, but everyone in Aotearoa New Zealand
- New ideas relevant to research problems can emerge from discussion with multiple stakeholders – two heads are indeed better than one!
- Negative and unproductive conflict can be avoided if those with different positions have an opportunity to understand why others think as they do
- People enjoy the stimulation of discussion with those who have different positions on controversial science and technology issues – they are hungry for more opportunities for these forms of talk.

Recommendations

The responsibility for progressing, enhanced relationships between science providers and the wider community does not rest in any one place. It will be achieved through coordinated support and policy, funding, and institutional initiatives and a culture in research environments that values input from those whose lives will be affected by new science. This coordinated approach will require:

- Identifying what organisational and funding structures are needed to facilitate meaningful engagement between scientists generating new knowledge and other members of the public with an interest in this knowledge and/or its application.

- Possible changes in funding and time periods of funding. In the short term dialogue initiatives, or strategies for engaging the public, can be seen as slowing research down, but in the long term strategies for engaging members of the public potentially speeds up uptake and implementation of science knowledge.

- Organisational commitment to ongoing relationship building outside of individual dialogue events.

- Inclusion of dialogue strategies in the development of public policy with respect to science and technology.

- Recognising the importance of dialogic, two-way or multiple forms of communication at both corporate and research programme levels in the organisational culture of CRIs.

- Developing methods to define the place of dialogue interactions in research outcomes relating to complex technology, patents and commercial development of the outputs of science.

- Working out the place for internal organisational dialogue in relation to research, and where the research programmes in an institution would like to place themselves on a continuum of community engagement. This also entails working out appropriate evaluations of dialogue or multi-faceted communication and engagement for different scientific programmes or controversial scientific issues.

- Recognising that dialogue 'events' are cumulative in terms of their relationship building with the community, and that once relationships are established organisations *and* communities have raised expectations about how relationships could or should be maintained. This has resource implications.

- Reflecting on the roles and capacities of social scientists and how their knowledge and skills could be successfully integrated into biophysical research programmes.

Section 1 Introduction

1.1 Cross case study learning – the Dialogue Fund Projects

Why do dialogue? This is a key question that needs to inform dialogue initiatives between science institutions and communities in Aotearoa New Zealand in terms of benefits to both science and communities. Calls for change within science institutions have been driven in part by the Ministry of Research, Science and Technology (MoRST), and the Foundation for Research, Science and Technology (FRST) as well as the Royal Society of New Zealand (RSNZ) and the Parliamentary Commissioner for the Environment (PCE), and in part by national and local government commitment to participatory democracy, the need for a 'civic' society (Adams and Balfour, 1998; Dryzek, 2000; Forgie, Cheyne and McDermott, 1999). Accountability to stakeholding communities is manifest in the education system in the form of school boards of trustees and in the health system in the form of district health boards. While sector-based structures and processes may differ, each is essentially part of national and international initiatives directed at enhancing citizen decision-making and bureaucratic responsibility outside the electoral cycle.

As stated in the early working paper (Allen et al, 2003), the need for science-society dialogue in Aotearoa New Zealand has not arisen in a vacuum, but is an international trend, impacting upon the ways in which scientific research is funded, carried out, and implemented. Science communities, governments using science to inform policy-making, and industries that use science to develop new products and technologies are increasingly subject to questioning by the public (Breckenridge and Hoeppel, 2003; Commission of the European Communities, 2003; Dierkes and von Grote, 2000; EUROPTA, 2000; Phillips and Orsini, 2002; Wynberg, 1993).

Flows of knowledge between scientists and other members of the public improve the relevance and uptake of research results, particularly in areas where there are multiple stakeholders and strongly contested views. Dialogue increases transparency in the science process. Because more viewpoints are involved, there is more potential for new ideas and ways of defining problems and finding solutions. Dialogue to improve understanding between different perspectives also reduces the level of unproductive and destructive conflict.

Another driver of dialogue is the global resurgence of ethnic rights and sovereignty issues for indigenous peoples. There is a growing recognition that different kinds of cultural knowledge and world views have a number of implications for the ways in which countries are governed, both nationally and regionally, as well as challenges to the dominance of western science as the legitimate way of understanding the natural world (Smith, 1998). Aotearoa New Zealand is unique in terms of its Treaty-based partnership with Māori through which governments and science communities need to negotiate with appropriate Māori communities, usually iwi, about how decisions around science and policy are made and implemented; what science is carried out, and who should be involved in carrying out that science (Cram, 2001; Dickinson, 1996).

The question which emerges from the call for dialogue is: *How do we make it work in respect to science?* These are important questions in the context of science funding in

Aotearoa New Zealand where public good science rests on the support of members of the public. Most science in Aotearoa New Zealand is funded through Vote Science or Vote Education. Most of Aotearoa New Zealand's current science investment is based on public trust and the expectation of public benefit. Dialogue initiatives need to be both initiated and evaluated, especially forms of dialogue around science that is – or could potentially be – the source of tensions between different groups in society.

Between 2002 and 2004 MoRST funded four independent pilot projects designed to trial and review approaches to dialogue in four distinct contexts. As part of this pilot initiative, MoRST also established a Dialogue Fund Evaluation Team – later renamed the Cross Case Study Learning Group (CCSLG). The function of this group has been to support the development and self-critique of the individual projects and to provide an integrated overview of the learning that emerged from the separate projects.

The final reports prepared by each of the project teams address the dialogue processes they used and the successes and limitations of these initiatives within their own particular contexts. These are available from the MoRST website at http://www.morst.govt.nz/?CHANNEL=DIALOGUE+FUND&PAGE=Dialogue+fund. In this report, the Cross Case Study Learning Group reflects on the collective learning available from these individual projects. Ongoing communication between the CCSLG and project leaders, as well as the project reports, is the basis for this report. Also informing the interaction between the Cross Case Study Learning Group and project teams was the experience of the learning group members who are also engaged in a variety of research and practical initiatives that involve discussion between scientists, technologists and other members of the community. It is important to examine the broad lessons that emerge across the projects, and, in the light of these, to examine how dialogue between science providers and communities could be better incorporated into the organisational culture and practice of both scientific institutions and community organisations. This report acknowledges the success of all four pilot projects, and builds on these achievements to address overarching questions such as:

- How can dialogue/ public engagement initiatives facilitate useful relationships between science communities and different 'publics'?[2]
- How can these be best promoted?
- How can dialogue/ public engagement initiatives be funded? What are the prospects for such initiatives in the future?

In reviewing the outcomes of the individual projects, the Cross Case Study Learning Group has considered the implications for Crown Research Institutes (CRIs), universities and other tertiary education institutions, policy makers, research funders and funding review panels. For example, one question arising out of the experience of the project teams (that extended beyond their project outcomes) was "what are the responsibilities of policy-makers in promoting dialogue?"

[2] The word 'publics' is used here to signal the way in which what is often referred to as 'the public' or 'the broader public' is in fact diverse. Acknowledging this diversity and developing strategies that draw appropriate sections of civil society into conversations about science and technologies that will impact on their lives is a key challenge for those involved in developing and applying new science and innovative technologies.

A key issue for the Cross Case Study Learning Group was the extent to which Māori participated in these research projects and the ways in which tikanga Māori processes informed the dialogue initiatives. The projects covered a wide spectrum of Māori involvement in science research projects and of the use of tikanga processes. The NIWA project sought to use tikanga Māori dialogue processes to engage two Māori groups and the Landcare Research Manaaki Whenua team incorporated aspects of the tikanga processes into a broader methodology to engage with Māori and non-Māori groups. The Victoria University and Waikato University projects aimed to include Māori research participants in research projects that did not centre on Māori methodologies or focus on Māori specific issues.

The following questions relating to Māori involvement were asked of each project team:

1. Did you have specific goals in relation to tikanga Māori dialogue? If yes, please describe these goals?
2. Do you perceive there is commitment to Māori within the organisation (university, CRI)? If yes, how is this evidenced? Did it have an impact on the way you designed the project and the implementation of the research design?
3. What aspects of the project were relevant for Māori
   - Procedurally?
   - Substantively?
4. In relation to Māori involvement – why did you choose the processes/approach you used?
5. Were these processes the outcome of consultation with Māori participants? If yes, what consultation occurred?

The responses of team members to these questions and the final project reports provide the basis for the 'Working with Māori and tikanga Māori' section of this report which focuses on the learning available from these projects about the use of Māori rituals in dialogue initiatives as well as strategies for involving Māori in discussion of science and technology.

1.2 Summary of the MoRST Dialogue Fund Projects

The MoRST Dialogue Fund was established with two fundamental objectives in mind:

- To develop pilot programmes that engage communities in discussion over science and technology related issues that are, or may become, a cause of tension between science and society, and
- To build improved relationships between scientists and the community based on two-way communication.

Applications were invited in June 2002 and four projects were selected from a large number of high quality applications. These projects received funding initially for two years with possible extension of funding for a third year depending on the outcomes of the projects. Two of the projects were based in Crown Research Institutes (the National Institute for Water and Atmospheric Research (NIWA) and Landcare

Research/Manaaki Whenua) and two in universities (Victoria University of Wellington and University of Waikato). All the projects selected for funding were based on the principle of dialogue being a two-way communication process between scientists and/or technologists and other members of the community, and included considerably different approaches to dialogue. Several of the projects also identified the need for communication between a diversity of groups within civil society about controversial science and technology issues. They recognised differences within 'society' and the need for conversations among members of communities, as well as between these groups and different groups of scientists and technologists.

All four projects clearly identified who were to be the partners in the planned dialogues, and opportunities for interactive exchanges were set up to demonstrate how dialogue processes could use commitment to bicultural communication and processes for interaction and political engagement. The projects were aimed at building participants' capacities for dialogue, widening their experiences and developing their understandings of complex issues through focusing on listening skills as well as opportunities for presenting information and arguments for positions. The initiatives of the project teams also frequently involved people who were not usually involved in conversations about science and technology issues – they did not just involve the obvious stakeholders. The dialogue processes enabled the participants to fully consider the issues and, where appropriate, offer clear pathways for actual behavioural change. This occurred during interactions among a number of groups who were given the opportunities to talk and get to know one another in a different context. These interactions did not just involve new relationships between scientists and other members of civil society, but new forms of cooperation and communication between different groups in the community.

The projects funded by the Ministry of Research, Science and Technology differed with respect to the organisational contexts in which they developed; the subject matter that was the focus of the project; and the processes used to facilitate dialogic encounters between different sets of people. Two of the projects dealt with controversial issues of national interest (human biotechnology and genetic modification). The other two projects dealt with regional and local issues respectively and explored how Crown Research Institutes might improve their relationships with the community, in order to promote appropriate and acceptable research outcomes. Two of the projects were deliberately experimental in their trialling of different dialogue strategies on the same topic (See Cronin and Jackson (2004) *Hands Across the Water* and (Roper, Zorn and Weaver (2004) *Science Dialogues: The communication possibilities of science-society dialogue*). Another project team refined and modified their strategy as they applied it to discuss the use of 1080 and the biological control of weeds in four marae settings over a four month period (See Lyver, Hayes and Horn (2004) *A Process for Enhancing Dialogue on Biosecurity* issues). The NIWA team focused on the strategic development of interventions with a particular stakeholder community on a specific issue – waste water management (See Tanner and Skipper (2004) *Finding Common Ground: Improving waste water management systems that address Māori cultural and spiritual values*). Summary and evaluation documents on each project are available from the MoRST Website http://www.morst.govt.nz/?CHANNEL=DIALOGUE+FUND&PAGE=Dialogue+fund

Project 1.

Landcare Research/Manaaki Whenua: ***A process for enhancing dialogue on biosecurity issues***
Phil Lyver, Lynley Hayes and Cris Horn

The primary aim of this project was to find a better way for scientists to have meaningful dialogue about contentious scientific issues with the wider community. The Landcare Research Project tested a dialogue process which combined principles from Franklin Covey's 'Seven Habits of Highly Effective People' programme with aspects of tikanga Māori (Māori custom) on two pest control issues: the use of 1080 to control mammalian pest species and the introduction of biological control agents for weeds. During the project, stakeholders with a history of involvement in these issues were invited to participate, as well as groups that traditionally had been less involved in discussion of these issues (e.g. women, youth, and older community members). The dialogue occurred at four two-day hui around the country: two in the North Island and two in the South Island (Lyver, Haynes and Horn, 2004).

Project 2.

University of Waikato: ***Science Dialogues: The communicative properties of science and technology dialogue***
Juliet Roper, Ted Zorn and Kay Weaver

The overall purpose of this project was to identify communication processes that have the potential to enhance the quality of public discussion about controversial science in New Zealand, in particular, human biotechnology (HBT). The research project included two major stages. Stage One involved preparation for dialogue, which included a literature review on dialogue, consultation with HBT scientists and focus groups with the public. Stage Two involved 'dialogue meetings', where the project team experimented with four different forms of dialogue groups: small groups, a 'citizens' dialogue' format, a public forum, and computer-mediated dialogue (Roper, Zorn and Weaver, 2004).

Project 3.

Victoria University: ***'Hands across the water' – Developing dialogue between stakeholders in the New Zealand biotechnology debate***
Karen Cronin and Laurie Jackson

The aim of this project was to contribute to pathways for behavioural change in the way science and society relations are managed in particular around difficult science issues such as Genetic Modification (GM). The project drew on approaches used in environmental conflict resolution, risk communication and technology assessment. Three techniques, which might allow dialogue to happen, were tested: Appreciative Inquiry, The Civil Conversation and Issues Mapping. The first two methods were developed from family therapy and organisational development, and trialled here for potential value in an area of public policy and science. These approaches were

customised for New Zealand and applied in small four-hour workshops by expert facilitators. Issues Mapping was developed by one of the project team members and derives from approaches in risk communication. The project evaluated the outcome of these different strategies as well as providing interesting material on overlaps and differences between thinking among those representing different positions on GM (Kronin and Jackson, 2004).

Project 4.

NIWA: ***Finding common ground – Improved wastewater management systems that address Māori cultural and spiritual values***
Chris Tanner and Apanui Skipper

The overall purpose of this project was to develop and evaluate a dialogue process between two Māori communities facing current waste water management issues, and scientists and engineers involved with wastewater treatment systems and water quality. This project established new, and built on existing relationships between iwi and NIWA. The focus was on developing a constructive dialogue exchange and mutual learning during two three day hui. Included in the hui were field trips to waste water facilities. An independent evaluator from Waikato University evaluated the project from the point of view of what it contributed – or did not contribute – to iwi participants (Tanner and Skipper, 2004).

1.3 The Cross Case Study Learning Group

During the two years of the initial funding, members of the Cross Case Study Learning Group met with project teams, discussed and reflected on progress with them, and organised a one-day feedback session for them to share their experiences and their findings. This workshop was held in Wellington at the MoRST offices on 26 February 2004, and the report of this workshop was made available to each of the project teams (Kilvington et al, 2004). It also significantly informs this final report. The project teams learned from each other during this workshop as well as through structured questioning facilitated by the Cross Case Study Learning Group. Because of different experience and capacity within the project teams, direct support of the Cross Case Study Learning Group was not really required, but ongoing opportunities to develop their thinking through reflecting on their work with an interested outsider was generally constructive.

Section 2 Learning across the projects

This section of the report discusses four major themes that are relevant to the learning generated across the projects: (i) processes for dialogue; (ii) capacity building and expertise; (iii) networks and relationships; and (iv) working with Māori and tikanga Māori.

2.1 Processes for dialogue

2.1a What is good dialogue?

All the project teams began with understandings about some key strategies to use for conducting, developing and promoting dialogue within their projects. These understandings were based on their review of relevant literature, their experience of particular strategies for communication or group engagement, or their interest in experimenting with new initiatives. In many cases, initial ideas about strategies for dialogue among participants were developed further through their use in particular settings. Despite the range of processes tried, all projects showed a marked consistency in what they considered to be the key strategies for facilitating good dialogue. The conclusions reached by the project teams can be synthesised in terms of the following elements. Processes and 'rules' include:

- Making people feel welcomed. This is an especially important aspect to marae-based dialogue.
- Providing a safe space/place where interactions are not bound by the usual organisational or individual constraints.
- Getting participants to listen without interruption to other points of view which may challenge their assumptions and points of view.
- Getting them to work on shared understandings – these can be related, for example, to passion for the topic area, or shared values.
- Good dialogue has structure – for example, it can entail listening, reflecting, and communicating what has been learnt to a wider audience.
- Good dialogue is set at a level at which all those participating can meaningfully contribute.
- A good dialogue process is designed within a continuum of engagement over an issue and is appropriate to the state of the relationships between people at that time. Dialogue events are cumulative in terms of their use in building relationships between scientists, technologists and other members of the community as well as links between different 'publics'.
- Good dialogue is not just putting 'a human face' to science; it is what follows from connections among scientists, technologists and other members of the public. This sets up opportunities for shifts in individual understandings as well as organisational change. Good dialogue enables shifts in understanding that arise out of a keen appreciation of the reasons for other points of view.

Although the projects used different processes, rules and structures of dialogue, they all had the above factors in common.

2.1b What makes dialogue processes work?

The project teams were required to evaluate the success of their dialogue processes. Most teams did so by assessing the response of participants and gauging their willingness to take part in a similar process again. Overall dialogue was considered to be successful when:

- An observable shift had occurred in the attitude of one or more of the participants and/or to the issue in question. A common example was that "*People stop talking about institutions and start recognising people as individuals*".
- Participants confirmed that they had been able to share their views and develop an understanding of the views of others.
- There was greater willingness to interact with other stakeholders than prior to the exercise.

Information about the fit between the design of the project and carrying out the dialogue exercises also provided insights on other factors contributing to the success or otherwise of the dialogue process. In general terms, these factors can be divided into three categories: the capacity and skills of the dialogue proponents and the participants, the manner in which engagement occurred, and the fit between these three factors.

2.1c What capacity and skills are required?

- Skilful, structured and independent facilitation of the dialogue event was identified as key features of successful attempts to create meaningful opportunities for conversations among differently positioned participants who were brought together to discuss a controversial science/technology issue (This was most obviously highlighted in the Landcare Research/Manaaki Whenua project and the Victoria University Projects).
- Developing the capacity of the participants – both scientists and communities – to engage in discussion was also seen as vital to any dialogue initiative. The dialogue process cannot simply be aimed at upskilling scientists to communicate. Gauging capacity to engage in two-way or multiple flows of information and argument was necessary. Flexibility in designing the approach (as demonstrated in the NIWA and Waikato University projects) is important. A degree of action learning is required to make long-term dialogue and relationship building processes work.

2.1d What processes of engagement facilitate dialogue?

- **Unfamiliarity with the process and/or the environment.** Participants in these dialogue initiatives were often encouraged to step out of traditional roles and historical patterns of interaction. This made people more receptive to doing things differently and encountering different ideas.
- **Sharing of food and/or social interaction outside of formal dialogue process**. Eating together and the informal conversation around food were used by all the groups as a way to enhance exchanges of ideas, information and strategies for action later in the meeting. This was an opportunity for people

who thought very differently on important issues to discover their 'co-membership' – their connections as parents, trampers, enthusiasts for certain styles of music, old cars or travel.

- **Clarifying expectations at the beginning**. People entering a dialogue event need to have a clear idea of what it is about and what will happen. Many participants had to shift from an outcome focus to a process focus during the dialogue events organised by project teams. The focus was not on convincing others of their views on the use of 1080, but learning how to communicate more effectively with those with different views.
- **Clarification of expectations at the end of a dialogue event.** A single event has limited capacity to change situations. Expectations of what can be achieved and what will happen subsequently also need to be carefully managed.

2.1e What has to fit together?

- There needs to be a good fit between the facilitator, the process, the topic and the participants in any dialogue encounter. While a range of processes can work, and no one process is necessarily better than another – the fit between these three ingredients is important. Facilitators are unlikely to be effective if they do not feel comfortable about the processes they are using.
- Dialogue is part of relationship building and begins before any dialogue 'event' and continues after this event. Dialogue is therefore part of what can be called strategic planning.
- Different dialogue approaches are needed for national, regional, sector, group levels of interaction. These approaches need to occur in environments that are comfortable to different participants – this can involve the facilitators and scientists bringing the opportunities for conversation to particular communities.
- The uniqueness of Aotearoa New Zealand needs to be taken into account. It is important to recognise that the particular attributes of this context – particularly working in a bicultural partnership – can present a variety of opportunities for different kinds of dialogue.

2.2 Capacity building and expertise

One of the intended outcomes of the MoRST dialogue fund was to promote the development of capacity for dialogue between science providers and the wider public. The project teams varied in their experience and access to expertise to assist with their dialogue initiatives. The following common issues emerged regarding capacity building.

2.2a External assistance

The projects collectively illustrated that dialogue processes need people with capacity in (i) communication and conversational processes and (ii) knowledge of the issues. The specific features of the setting or location in which the dialogic conversations will occur are also of vital importance. The projects were designed, in part, to suit the existing capacities of the project team as well as 'outside' help that could be relatively

easily accessed (often through external networks and working relationships that preceded the Dialogue Fund projects).

All the Dialogue Fund projects brought in skills external to the core project team (and often external to the organisation) to support their work. For instance, the NIWA project team brought in a soil scientist from Landcare Research, a Massey University lecturer with expertise in communicating science to a non-science audience, and employed an independent Māori evaluator from Waikato University. The Landcare Research team engaged Wendy McPhail, a skilled Seven Habits facilitator, who had run Seven Habits courses for Landcare Research staff and co-facilitated events using this technology with one of the core project team. They also invited Here Wilson to lead the women in ways that were appropriate or tika in the marae context. The Victoria University team engaged the services of those expert in using Appreciative Inquiry and Civil Conversations to experiment with different strategies for talk among GM scientists and activists groups on the issues surrounding GM.

Dialogue events need skilled facilitation which is process specific, regardless of the topic discussed or the setting for the dialogic discussion. At the same, time facilitation skills are not standard. Even between facilitators working on the same project, variation can influence the dialogue event. All project teams brought in people with specific facilitation skills to assist in the dialogue events. Although those project team members already involved in dialogue processes may build their own individual skills in facilitation and dialogue, this does not replace the need for a skilled and independent facilitator. One project group also found they needed facilitators to have an understanding of the issue being discussed in order to appropriately moderate the process used. Independence and generic facilitation skills may at times need to be traded off against knowledge of the issues to be discussed.

2.2b Institutional and/or organisational capacity

As the projects included teams from both Crown Research Institutes and universities, the Cross Case Study Learning Group explored the differences this might make for capacity building in dialogue. Project teams from the universities observed little in the way of direct support for their work from the university, but commented on the value of the perceived ‘neutrality’ of the organisation as a good standpoint for working on controversial issues. One university project team also commented on the potential of universities to work in this area, due to the wide range of expertise and differing values within a cross-disciplinary institution which is different to a focused research institute. In contrast, both of the projects based in the CRIs commented on the role the dialogue initiatives played in long term relationship building between their institution and groups within civil society.

Unlike the university based teams, the CRI-based teams were more inclined to see their projects as an opportunity to upskill the organisation and to extend existing relationships. Building on these relationships tended to be seen as a basis for aspects of the success for the projects funded through the Dialogue Fund. Members of the university teams also built on existing relationships when recruiting facilitators, finding venues for events or inviting participation in the project, but these relationships had often been developed outside university settings and were sometimes not connected to existing university jobs.

Issues around policy and funding capacity building are addressed in Section 3 of this report.

2.3 Relationships and networks

All the projects relied heavily on existing networks, with difficulties observed by project teams commonly linked to a lack of networks in needed areas, or historic relationship difficulties. However, the projects also drew together teams of people who had not previously worked together. Thus, the dialogue initiatives both rely on and extend networks. All teams also observed that the time taken to build the relationships required for their project was considerably more than anticipated. In the case of one project, the team encountered difficulties in its own internal communication and networks that had to be resolved before progress could be made in building the right platform for dialogue with an external group.

The project teams clearly experienced the individual dialogue events as resting in stream of relationship building activities. Each event built on that which had come before it, but also built expectations for the future. The project teams found themselves having to address the question of "what happens after this event?" – a question frequently raised by those participating in the Dialogue Fund projects. Even those projects that had drawn together participants from the general public were forced to manage a raised expectation relating to the continuity of dialogue. Having initiated events, the project teams felt a responsibility to further the interests of the new relationships and networks that had evolved.

2.4 Working with Māori and tikanga Māori

The ability of the dialogue projects to effectively engage groups was always going to be limited by their short term duration and experimental nature. Managing expectations was always going to be a challenge as many Māori groups will often only engage in dialogue processes that are going to result in action and mutual benefits. As articulated by one of the project teams:

> Understanding without action is impotent… which was always going to be an issue in this project. ...in order for dialogue to be truly meaningful as the Māori participants request, the process requires praxis – or meaningful action (Tanner and Skipper, 2004:70-75)

However, the innovative and robust approach to achieving effective dialogue and the broad nature of how each project dealt with Māori matters, provided valuable insights into how Māori engage in dialogue and what is effective Māori dialogue.

2.4a Tikanga Māori based dialogue processes

All peoples and cultures have had to engage in discussion about important issues influencing their lives and, in the process, developed over centuries sophisticated culturally specific protocols, values and traditions around dialogue. Māori dialogue

processes are no different. Rituals of encounter (e.g. powhiri), proverbial sayings (e.g. te kai a te rangatira, he korero – discussion is the food of chiefs), and key concepts (e.g. manaakitanga – hospitality) underpin these processes. Mihimihi and poroporoaki are important mechanisms for clarifying expectations at the beginning and end of hui as well as looking after people and putting them at ease. Entertainment and humour (whakangahau) and the use of food are also essential components of tikanga Māori based dialogue processes.

If tikanga Māori provides the basis for Māori dialogue processes, the marae is the dialogue hub. Relationship building before and after marae based dialogue events are a normal part of Māori dialogic processes and they are underpinned by key tikanga concepts such as whanaungatanga (family connects), whakatuhonohonotanga (connectedness) and whakapapa (genealogical ties).

These brief descriptions of tikanga Māori based dialogue processes cannot adequately explain these sophisticated, but often subtle, tools of engagement. The key point is that these processes have been effective for Māori and have potential to be useful for a broad range of research methodologies.

> Once these tikanga are brought to consciousness, it is clear that they are rooted in a deep understanding of human psychology. When applied by skilled practitioners, they are highly effective in achieving their aims. They are a resource Pākeha have been foolish to neglect (Metge, 2001:6).

Using marae as a dialogue venue and tikanga Māori as a basis for research methodologies remains unfamiliar to most science research institutions. This may be useful for facilitating new approaches to dialogue on a variety of issues as more than one of the projects found that unfamiliar dialogue processes assist participants to step out of their traditional roles and break historical patterns of behaviour.

> Fundamentally, people need to learn new rules. This process allowed them to engage in a new and promising way. It is worth using what might seem like an artificial approach because it disrupts the old channels and expectations of participants (Cronin and Jackson, 2004:137).

As Māori dialogue processes become more familiar and used as research tools, a key challenge will be how non-Māori use Māori dialogue processes and how such processes are incorporated into other research methodologies. Tikanga Māori and marae protocol is flexible and able to be adapted to the needs of people or the situation at hand. The overarching principle of a marae is ensuring the wellbeing of the people, particularly the wellbeing of the visitor (manuhiri). Māori often adapt powhiri processes to meet the needs of a specific situation and a less formal version of the powhiri (the mihi whakatau) is becoming more commonly used to begin hui. This is a relatively recent development based on the needs of a modern society and used in a variety of situations both on and off the marae.

Widespread discussion is needed about how science research methodologies incorporate tikanga based dialogue processes. Should powhiri and other tikanga be adapted or experimented with to meet the needs of researchers? Could mihimihi or poroporoaki be lead by non-Māori or in the English language? Is this an unacceptable

watering down or dilution of the tikanga based processes and should we continue to use Māori names (e.g. powhiri) or is it better to use non-Māori names (e.g. group welcome or introductions), and what would we lose by doing this?

Guidance on the above questions is provided by kaupapa Māori research philosophies which insist on Māori controlling the utilisation of Māori knowledge and traditions (Tanner and Skipper, 2004:18). Key to adapting tikanga processes is the expertise and knowledge of the facilitators who must have a broad understanding and extensive experience of Te Ao Māori (the Māori world). It is unlikely, but not impossible, for non-Māori to do this and the effectiveness of these processes would be lost without the use of te reo Māori. It is a skill to be able to effectively adapt tikanga dialogue processes to the proceedings at hand and, if done appropriately, tikanga Māori processes can set the platform for successful dialogue.

> Although it is common place for Māori cultural practices…to be included in the planning of public occasions, they are typically additions rather than an integral part of the proceedings, 'clip-ons' carried out by Māori according to tikanga (Metge, 2001:3).

The key distinction between tikanga based dialogue processes and others is the emphasis placed by Māori on developing relationships and spiritual and historical connectedness. Powhiri and mihimihi are driven by the need to connect the people involved with the land and the spiritual realm. Such processes can be seen as confusing, frustrating, boring, and even annoyingly time consuming, to people who have little appreciation of te ao Māori (the Māori world) or want to get on with the 'business of the day'.

Tikanga Māori places the importance of developing relationships with people at the heart of all ritual encounters. It deems it important to take time to share who you are, where you are from and to connect to the mutual spiritual values that bind all people. Such discussions are often repeated and are a necessary precursor to any discussions about the kaupapa or subject of the day and in fact are often designed to build trust, facilitate good discussion and break down any barriers. Some of the benefits of tikanga based processes are often subtle and non obvious (e.g. the distinctive roles of men and women). Teams noted how a lot of learning happened in informal settings (over a cuppa) and that much of the relationship building happened during the informal settings such as over kai.

2.4b Breaking down barriers, stereotypes and misconceptions

Essential to breaking down the barriers between Māori and scientists is the building of the trust that has been eroded by past experiences of Māori being told about proposals rather than being actively engaged in dialogue before they were developed.

Breaking down negative preconceptions and intergenerational stereotypes is a first step for more effective dialogue between Māori and scientists. Whilst science has not done well in the past in engaging Māori, there are also misconceptions by some Māori about science. Such misconceptions were articulated by one participant in the Manaaki Whenua project who expressed surprise and delight about meeting and

talking with scientists whom he never imagined would be interested in things he knew.

> The realisation that these scientists were people with similar values to him provided space for him to learn about the science and other perspectives (Lyver, Hayes and Horn, 2004:13).

Maintaining the integrity of research participants and the research process is also essential for achieving conditions for good dialogue. For Māori this often means having some control over setting the research agenda and process. For Maori, the research process needs to be a mutual exchange where science has the chance to be fully utilised and debated. All participants must have the opportunity to be active in the research. Providing for Māori to be actively engaged and ensuring the integrity and effectiveness of the research process can be challenging. This was experienced to a greater or lesser extent by all four projects.

> For this project, it has been important to balance the needs and interests of two quite distinct groups, and ensuring that their voices are accurately reflected. It is also important to ensure that the voices are balanced and given equal weight (Tanner and Skipper, 2004:66).

Once trust is established, the ability to work towards common goals will be more easily achieved. Negotiating through the issues associated with engaging Māori communities can be like negotiating a minefield and is challenging even for seasoned Māori community practitioners. It is understandable why there is so much distrust by Māori who have participated in one way consultation processes in the past. This point was well made by the NIWA team, highlighting the lack of knowledge of non-indigenous people as a major source of tension (Tanner and Skipper, 2004: 73-75).

It is also understandable why researchers not connected to the Māori world choose not to engage and often find it frustratingly difficult to include Māori components and people in their research projects. There is also a real danger in overstating and generalising about how Māori groups will respond negatively to requests to participate in research. One of the project teams were advised that Māori would be reluctant to participate due to consultation burn out and fatigue, but the reality was that it was easier than expected to successfully negotiate their participation (Roper, Zorn and Weaver, 2004).

Whilst working through key process and control issues with Māori are challenging, the rewards are there for those researchers willing to take the time to work through these issues. Having the time to build relationships and learn from each other is a major obstacle to effective dialogue. This is particularly the case for Māori who are often expected to fit into the schedules of scientists and provide their time, information and resources, often for little or no remuneration (Tanner and Skipper, 2004:73).

The use of ‘traditional’ Māori knowledge in science research is an issue that has the potential to generate tensions and stifle effective dialogue. The extent to which this will be an issue depends on the subject matter being dealt with and the level of trust between researchers and participants (Tanner and Skipper, 2004: 64).

Māori demand that their traditional knowledge is protected from use or abuse without consent or benefit as has happened in the past. Establishing clear protocols for addressing these issues is essential at the outset of any research project where this may be an issue. Setting clear boundaries and negotiating parameters is vital in highly volatile and sensitive research areas and real skill is needed to manoeuvre through the politics and work out what the key issues are.

The mistrust and anxiety expressed by indigenous peoples globally about the misappropriation of their knowledge is justified and well documented. There is much literature about these issues and details of possible protocols for addressing the protection of indigenous knowledge.

Expectations of science researchers seeking to understand and learn about matauranga Māori, rather than abusing and misappropriating this knowledge, also need managing. Māori and non-Māori researchers who are genuinely interested in learning about matauranga Māori need to be conscious that what they are looking for may or may not exist, or take years to learn and appreciate. This is particularly pertinent if the researchers lack a deeper understanding of te reo Māori. Kaumatua and other repositories of traditional Māori knowledge may be unwilling to share this knowledge for a variety of reasons, including lack of trust or other political or strategic reasons. Another factor is the time needed to access the knowledge required due to the fact that participants either do not know that their knowledge is relevant or the knowledge may have been lost.

Regardless of the above issues, the place of traditional Māori knowledge in science research will continue to be a source of tension and this was a lesson learnt across the projects.

> Māori seem to be very protective of their culture and at times I felt they were hesitant about 'giving too much away'. To be successful I felt that the project needs to be an iterative one in which information passes from and back to Māori and, as more is understood, so the project outcomes are more successful (Tanner and Skipper, 2004:63).

Such tensions will be alleviated by increased trust from Māori that their knowledge will be protected and the development of meaningful and mutually beneficial relationships.

2.4c Future directions

Despite limited scope and timeframes, the four projects provided valuable insights into how to do better dialogue with diverse Māori communities. Insights about dialogue with Māori across the projects were often restatements and clarifications of past learnings. Reviewing how groups communicate with each other is always valuable and there is a need for ongoing flows of information among Māori and scientists since most scientists remain uninformed about the Māori world.

One-way communication and consultation processes with predetermined outcomes have eroded trust amongst Māori which may result in a cynical response to renewed

attempts at dialogue. Opportunities exist to implant a positive consciousness across the science sector about engaging Māori communities in science research and other matters. Science in particular might be more readily seen by a wide range of communities as a tool to aid Māori development in accordance with Māori priorities and values. This may have not happened in the past, but seeing scientists and science organisations advocate Māori perspectives is a step forward in building trust (Tanner and Skipper, 2004:28).

Despite these opportunities, long term mutually beneficial relationships with Māori and all communities will only occur if the lessons of the past are heeded.

> Dialogue appears to have taken on a certain vogue, and may be employed with good intentions. However, if it is still primarily about telling communities how they should respond to science and technology – trying to convince them and reorient their perceptions of risk – it may run into social resistance. A backlash may, in turn, create more problems for science communication than a conventional strategy (Cronin and Jackson, 2004:139).

Scientists must acknowledge previous negative experiences by Māori of science as well as addressing issues of power inequality and control if there is to be effective dialogue between non-Māori scientists and technologists and Māori.

It is appropriate to cast aside the old ways of dialoguing with Māori and use the experience of kaupapa Māori aware researchers and research practices that respect and strive to incorporate tikanga based principles and practices. Māori development, scientific advances, and increased demands from regulators and research fund providers create a space for achieving significant progress. The challenge for science and Māori communities reflects wider issues in Aotearoa New Zealand. Experiments in the use of these strategies for dialogue and engagement about science can be a source of strategies for constructive engagement about other forms of controversy.

Section 3 Challenges and strategic responses

3.1 From two-way dialogue to strategies of engagement

The MoRST funded dialogue projects responded in different ways to the challenge of exploring new types of relationships between science providers and publics. All project teams approached those challenges with a commitment to generating new strategies for communication among scientists and other members of civil society and interventions that would assist people in understanding others' points of view. This is in line with what writers and observers in fields such as risk management, science and technology studies and public communication have elsewhere eloquently described as the transition from firstly, informing; secondly, consulting; and finally, to engaging different sections of the public in discussion about new science and its applications (Irwin and Wynne, 1996; House of Lords Select Committee on Science and Technology, 2000; Wynne, 2001; Irwin, 2001; Peterson and Bunton 2002; Elam and Bertilsson, 2002; Irwin and Michael, 2003). As Cronin and Jackson (2004: 139) indicate in their report, attention to informing 'the public' has shifted to a focus on dialogue or two-way communication between scientists and non-scientists.

More recently, there have been conversations about strategies directed at 'engagement' between people with different positions on particular science and technology issues. Cronin and Jackson (2004:139) state: 'The term 'engagement' implies a more active process of relationship building with stakeholders, including, but doing more than 'two-way communication'. Relationships emerge from direct engagement between individuals and have to be built up over time.' Significantly, the language of 'engagement' rather than dialogue is used in a recently published collection of international analyses of citizens' debates about science and technology. It identifies the need to consider 'globalisation and the challenge of engagement' (Leach, Scoones and Wynne, 2005). The attention is on 'processes of public engagement' and issues of rights and democracy.

This resonates with recent attention to the etymology of 'dia' in the word 'dialogue'. Heather McCann (2004) has argued that, while 'di' may indicate duality, 'dia' refers to relationship or 'alternation' rather than 'twoness'. She suggests that 'dialogue' can become a communicative event where multiple voices alternate; taking turns to speak without 'disputation' (McCann, 2004: 3). The dialogue projects funded by MoRST all illustrated in different ways the importance of breaking out of a dualistic 'science and society' framework and embracing the possibility of engagement about science and technology issues from multiple positions. Scientists and technologists who participated in these projects advanced a range of different arguments. Members of the public were at times in dispute with one another. People who were brought together for dialogic discussion on issues like the use of 1080 and biological control of weeds engaged in what Erikson (2001:163) has referred to as 'situational co-membership' – forms of interaction that facilitated attention to commonalities among them – despite their different positions on controversial science and technology issues (See Lyver, Haynes and Horn, 2004 and McCann, 2004 for further discussion of the notion of 'co-membership').

3.2 The future of dialogue/engagement?

The projects illustrated a number of positive experiences of engagement – enabling people to explore working in partnership; breaking down stereotypes; and identification of a diversity of interests and perspectives within and between groups. The dialogue projects relied on extended existing relationships and networks; brought together new research teams with new skills; enabled the emergence of new research possibilities; and enhanced the learning capacity of the participants. Not least, many individuals, scientists and non-scientists, enjoyed the experience. They found it stimulating and were eager for opportunities for further discussion, particularly discussion that would enable input into policy decisions by government. However, project teams and project participants also raised questions about the place and future of dialogue given current institutional, policy and funding structures within the broad science community. Three key questions raised are:

- Is the concept of 'dialogue' already going off the political agenda as anxiety over the contentious GMO debate diminishes?
- Will the resources needed for dialogue reduce the amount of project money available for 'science'?
- Will 'dialogue' become a meaningless catch phrase to secure funding, and potentially support persuasive rather than discursive communication strategies?

Many participants learned new behaviours in the dialogue processes, but were then faced with the challenge of practising these in their existing work environments with colleagues who had not had the experience of participating in these dialogue initiatives. Furthermore, there are a number of costs and not insignificant infrastructural support necessary to integrate dialogue into science and public communication systems. Broadly these issues can be seen to be covered by:

- Skills and capacities needed to undertake dialogue
- Issues around timing
- Balancing science project goals and dialogue
- The need for review processes.

This section covers each of these respectively.

3.3 Skills and capacities for dialogue initiatives

One of the factors that stood out across all the pilot projects funded by MoRST was the need for skilled facilitation and conflict management. This implies that existing science teams wishing to engage in dialogue or public engagement on an ongoing basis will need to bring new skills into the team. This brings up issues about funding – what aspects of the research will need to be curtailed in order to provide a new skill set, or what new funding sources could be used to support the development of new facilitation and conflict management skills among team members or the contracting of people with such skills?

The dialogue fund projects commonly started with an assumption that members of the science community might be unfamiliar with skills such as active listening that would enable them to take part in open dialogue sessions with members of the public. However, it also became apparent that the communities the scientists were attempting to engage with were often equally unprepared for mutual and respectful exchanges. Public consultation experiences have largely directed participants toward reactive rather than co-constructive forms of engagement. Hence dialogue processes that attempt to reform relationships between science providers and other members of the public must be able to facilitate the exchange and ultimately build the capacity for constructive communication among scientists, technologists, those involved in the development of policy and members of the public with a diversity of positions on controversial science and technology issues.

3.4 Timing issues

Issues of understanding go beyond developing the skills individuals can use in exchanges around contentious subjects. There is a need to address questions about when, where and how to integrate dialogue into research programmes and research strategies. Brian Wynne (2004) has argued that most attempts to engage members of the public in discussion of science and technology issues occur 'downstream' when there has already been significant financial investment in new science and when its applications are being reviewed by regulatory bodies. He advocates the 'upstreaming' of public engagement and dialogue processes – their incorporation into the processes of decision-making about investment in new science (Wynne, 2004).

The 'upstream' and 'downstream' distinction has been adopted by a variety of different scholars and analysts including the UK Royal Society and Royal Academy of Engineering (2004: 67) and analysts at Demos, a UK-based organisation that focuses on Technology and Science, Policy-making and the Environment. A recent Demos document argues for 'why public engagement needs to move upstream' (Wilsdon and Willis, 2004). This is echoed in Andy Stirling's assessment of the need for 'upstream processes of knowledge production in the context of new forms of science politics' (Stirling, 2005). Integration of dialogue strategies into research programmes at all levels of their development also needs to consider different approaches to dialogue and public engagement that will vary depending on whether the science research is issue based, or context driven and specific to particular localities.

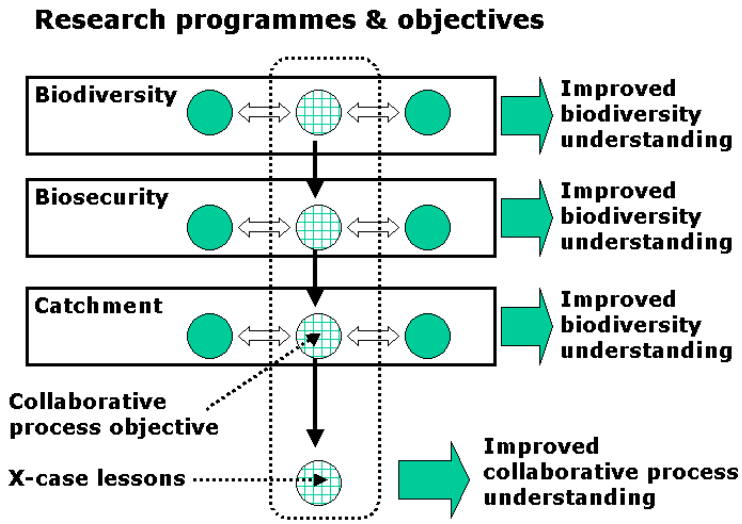
The Dialogue Fund projects clearly illustrate that, while many processes may work, the fit between process, problem and set of actors is most important, and the place of any one dialogue event in the continuum of relationship building and problem resolution needs to be considered, especially in light of raised expectations. This indicates a need for flexibility that can best be informed by active and supportive research and evaluation, i.e. an action research approach to the development and undertaking of dialogue. Beyond this, strategies for productive engagement between scientists and other community members clearly rest on understanding the relevance of different approaches to dialogue to the context of Aotearoa New Zealand.

Strategies developed elsewhere can have different outcomes in this context and strategies that work for Māori may not work for Pākeha and vice versa.[3]

3.5 Balancing science project goals and dialogue

In the short term it can appear that dialogue and science project management can be at cross purposes. Science projects are specified usually in advance with set contracts, and the main goal of the project manager is to get the contractual outputs achieved in the most resource-efficient way. In contrast, good dialogue is measured not by outcome, but by the quality of the process in relation to perceived outcomes.

Figure 1: The way in which science 'dialogue' can both support and cut across project management.

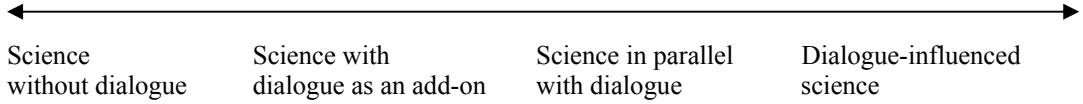


The figure above represents the ways in which there are, most commonly, preconceived outcomes of scientific research that, in large, remain unrelated to dialogic processes. This way of seeing science is reflected in funders' requests for proposals, and requirements of academic publishing, both of which create challenges for change.

The figure below summarises the range of ways in which scientists might use dialogue/public engagement initiatives. These strategies will legitimately vary depending on the extent to which the science has direct and controversial impacts on particular communities of interest.

[3] See Cronin and Jackson, 2004: 165 – 171 for discussion of issues relating to using methods developed for US participants in the context of Aotearoa New Zealand.

Figure 2: **A continuum of dialogue and science interaction**



Each of the options depicted above will require policy development, funding requirements and capacity building of different kinds, including better understanding of the role and contribution of social scientists in science research institutes. Given all the MoRST Dialogue Fund projects highlight the importance of, and time required to develop, relationships – of which dialogue is a part – there may be a need to consider how funding is apportioned and for what period of time, as well as the drivers and constraints of organisational change, if there is to be any extension of public engagement with science and technology.

3.6 The need for review processes

To be effective in transforming science-community relationships dialogue needs to be a rigorous and grounded process. Questions of when, why, how and what is working need to be continually monitored. There are risks related to expectations that need to be managed in order to maintain trust, especially in light of historical events that have eroded trust in science and political organisations. Accordingly, dialogue must be done well, and used appropriately if it is to support science and empower members of the community who participate in discussions about its application.

While review of strategies to involve members of the public is increasingly recognised as important, the dialogue components of scientific projects remain largely hidden in conventional research proposals and published conclusions. As a result, its application in design and practice can often be less rigorously reviewed than the design and practice of more conventional science activities. Accordingly, if the science community wishes to ensure the relevance and rigour of dialogic research initiatives, then it needs to openly use review or evaluation approaches that ensure programmes are examined from this perspective. Reviews and/or evaluation of this component of science need to be undertaken by those with appropriate social engagement experience and skills. One suggestion here would be to use a similar process as is currently being used to assess the Māori responsiveness of many scientific projects.

The researchers funded through the MoRST Dialogue Fund project had a significant commitment to networking and peer evaluation. Most of the teams engaged in two categories of evaluation. They provided feedback sheets to participants and analysed their response to the event/s. They also attempted to assess what participation in forms of community engagement could mean in the long term for research participants. A number of participants were very interested in what dialogue leads to and why should they engage in it. This will be an ongoing issue to be addressed by those involved in dialogue initiatives.

Section 4 Networking for the future

The large number of applications for funding from the Dialogue Fund indicated considerable interest in 'science-society' dialogue, and enthusiasm for trying new initiatives that would not otherwise occur because they are not part of current science research portfolios, or required by clients, and therefore not funded. These applications suggest that there is a network of people with interest and expertise in this field. In a context in which science funding increasingly depends on establishing research relationships and partnerships, particularly with end-users, is it possible to establish and maintain a network of people interested in furthering dialogue initiatives? And how can such a network be sustained? The Ministry of Research, Science and Technology is extremely well placed to initiate meetings of those across a number of sectors who have interest in participating in such a network. Crown Research Institutes have a significant interest in exchanges of information and expertise in such a network. The meeting in February 2004 of those involved in the MoRST Dialogue Fund Projects and the cross case study learning group was an extremely valuable learning exercise (Kilvington et al, 2004).

Another issue that is raised by the dialogue projects is the difference between scientists engaging in dialogue as individuals and as representatives of the organisation in which they work. Roper, Zorn and Weaver (2004: 2), for example, maintain the anonymity of the scientists who participated in their project. Similarly the GE scientists who participated in Cronin and Jackson's project could interact with anti-GE activists as individuals and not as representatives of their CRIs or universities. The separation of scientists and their institutional context was enabled by ways in which dialogue was structured in the projects, but it is unlikely that networks of 'dialogically-minded' individual scientists would emerge spontaneously. Therefore it appears that networks will need to be initiated and maintained through organisational structures and processes. It also needs to be acknowledged that, when scientists are not anonymous, it may be more difficult to conduct the sort of dialogic endeavours that characterised the Victoria University and Waikato University projects.

The two projects that involved CRI scientists were more likely to involve scientists identifying themselves and being held accountable as members of their institutions for some of the negative consequences of mainstream science. The Landcare Research/Manaaki Whenua Project involved scientists presenting knowledge relating to 1080 and the biological control of weeds to diverse audiences, but the NIWA project was the only MoRST Dialogue initiative that actually built towards ongoing relationships around a particular issue (waste water management) and involved scientists being most accountable for the impact of their scientific work.

Two recent events have indicated the potential for networking between CRIs. The first was a workshop at Crop and Food Research (Lincoln) organised by Barbara Nicholas from Ministry for the Environment and the Bioethics Council, where the focus was on identifying why and how scientists might engage with the public. The second event was a cross CRI meeting held at ESR (Christchurch) where those working in the area of 'social science' could share experiences and talk about the issues that faced social scientists working in biophysical science institutes. While

there was muted agreement that collaborative research bids might enable better networking and use of resources, there was recognition that the role of social scientists and how they work in CRIs needs to be shared among scientists and documented in ways that promote collaborative learning, and that initiatives for this networking need to be funded by CRIs and/or MoRST.

Within the universities, the Building Research Capacity in the Social Sciences (BRCSS) initiative has the potential to facilitate networking between universities and CRIs, because CRIs are seen as clients of social research education development in universities and BRCSS is committed to capability building in the social sciences. This capability cannot be developed without close links between tertiary education providers, the CRIs, government agencies and private research providers who are potential employers of graduates. However, whether social science networking is an effective vehicle for promoting networks of scientists with an interest and commitment to dialogue needs to be questioned. There is a potential danger of dialogue being seen as the responsibility of social scientists rather than biophysical scientists. Both may need to draw on the services of good communicators and facilitators as they work together, and with diverse stakeholders engaged in conversation about critical issues relating to science and technology. The tendency for social scientists to be brought in as specialists to 'do dialogue' at the 'downstream' end of large scale projects is not appropriate. Conversation from the start about how publics can be involved in project development is much more fruitful and need not be solely the field of social scientists.

Projects in the biological or physical sciences that have social, cultural or ethical implications should involve conversations from the start with relevant publics. This should include those who are principal investigators – they need to be involved in conversations from the start about how people can be involved in the projects they lead. They can use facilitators as resource people who assist all the groups involved in joint decision making about the development and application of new scientific knowledge.

There is a need for:

- More precise and focused information on how dialogue can be incorporated into research programmes. This should be accompanied by attention to the development of criteria to assess the relevance and potential effectiveness of dialogue or engagement strategies.
- A conference on joint research endeavours that cut across disciplines and diverse knowledge systems. This would bring together people who have specific skills and knowledges but are working on projects that require conversations across established boundaries in order generate new knowledge.

Section 5 Recommendations

The responsibility for progressing, enhanced relationships between science providers and the wider community does not rest in any one place. It will be achieved through coordinated support and policy, funding, and institutional initiatives and a culture in research environments that values input from those whose lives will be affected by new science. This coordinated approach will require:

- Identifying what organisational and funding structures are needed to facilitate meaningful engagement between scientists generating new knowledge and other members of the public with an interest in this knowledge and/or its application.

- Possible changes in funding and time periods of funding. In the short term dialogue initiatives, or strategies for engaging the public, can be seen as slowing research down, but in the long term strategies for engaging members of the public potentially speeds up uptake and implementation of science knowledge.

- Organisational commitment to ongoing relationship building outside of individual dialogue events.

- Inclusion of dialogue strategies in the development of public policy with respect to science and technology.

- Recognising the importance of dialogic, two-way or multiple forms of communication at both corporate and research programme levels in the organisational culture of CRIs.

- Developing methods to define the place of dialogue interactions in research outcomes relating to complex technology, patents and commercial development of the outputs of science.

- Working out the place for internal organisational dialogue in relation to research, and where the research programmes in an institution would like to place themselves on a continuum of community engagement. This also entails working out appropriate evaluations of dialogue or multi-faceted communication and engagement for different scientific programmes or controversial scientific issues.

- Recognising that dialogue 'events' are cumulative in terms of their relationship building with the community, and that once relationships are established organisations *and* communities have raised expectations about how relationships could or should be maintained. This has resource implications.

- Reflecting on the roles and capacities of social scientists and how their knowledge and skills could be successfully integrated into biophysical research programmes.

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