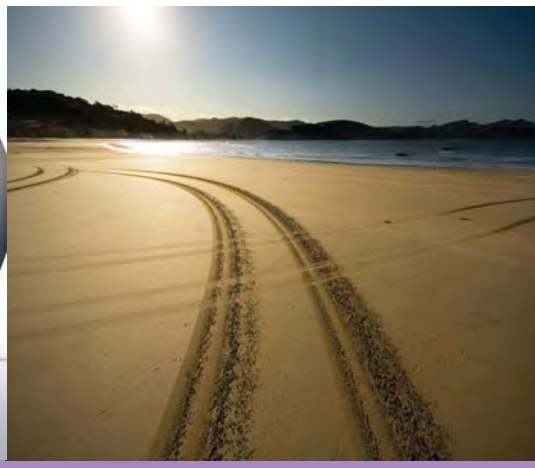
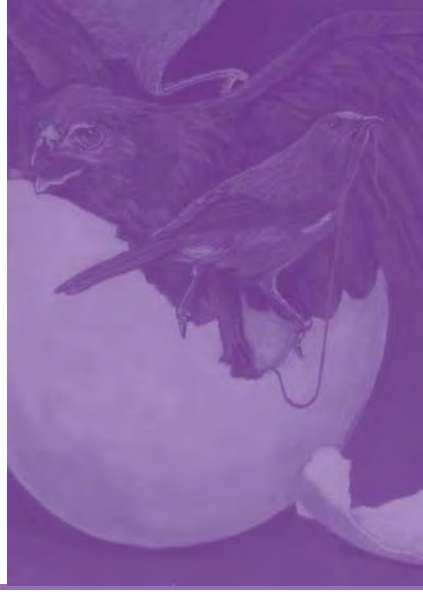
section five



The future as a set of choices

It is easier in the face of great challenges to believe in inevitability, safer to shuffle deckchairs, more human to deny change is happening. It is a mark of leadership, however, to believe that we can make choices – especially when those choices are hard and require a fundamental review of our assumptions. New Zealand has enormous potential to determine its own future but only if it acts decisively and proactively. In this last section we consider the next steps for sustainable development both in New Zealand's research and practice and beyond.



Sustainability: a conversation between business and science

Discussions about sustainability point to very different perspectives in the worlds of business and science, yet collaboration between the two will be an important ingredient in delivering sustainable development.

Sustainable Development: responding to the research challenge in Aotearoa New Zealand

With its limited resources how can New Zealand best contribute to sustainable development research? The response includes our approach to research funding and aspects of governance in business and society.

Unending

Concluding remarks

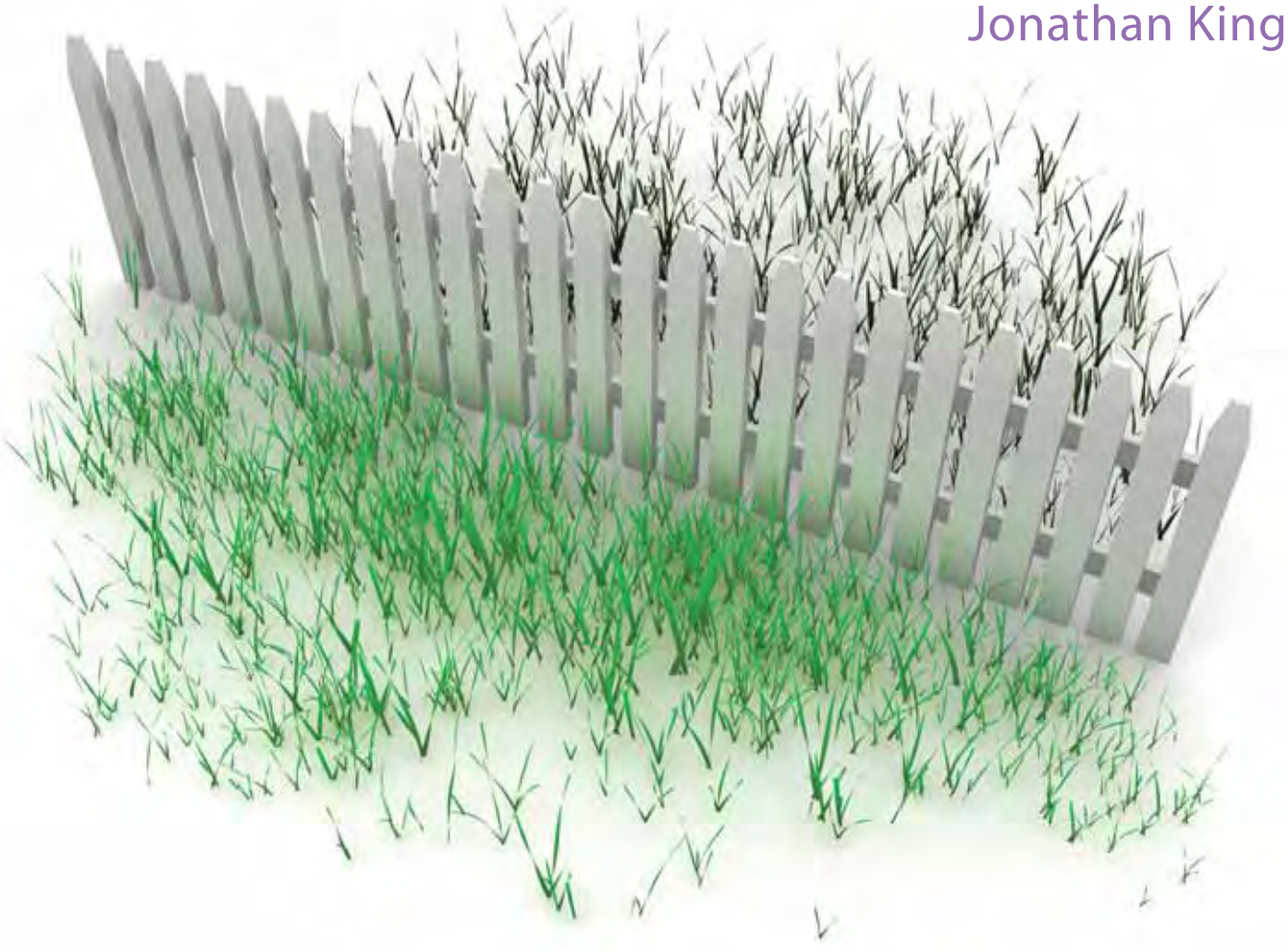
Landcare Research
Manaaki Whenua

Sustainability conversations

Business and science perspectives on sustainability

CHAPTER 28 : HATCHED

Helen Fitt and
Jonathan King



Summary

- Most interviewees discuss sustainability primarily in terms of environmental issues. Social, economic and cultural sustainability are less prevalent topics.
- Business and science interviewees approach sustainability differently; business interviewees focus on concrete sustainability actions, while science interviewees more commonly discuss broader and more nebulous concepts around sustainability.
- Business interviewees perceive there to be some problems with science in New Zealand, particularly in the way in which science agendas are set and the impact of this on science credibility.
- Science interviewees are more positive about science in New Zealand, but also present concerns about the prioritisation of different areas of science, including those relating to sustainability.
- Business and science interviewees identified that there is pressure on their organisations, primarily from customers (including research funders, users, and students), to appear sustainable.
- Interviewees from both sectors also noted that their organisations pursue sustainability actions to attract and retain staff, to take advantage of new business opportunities and to maintain alignment with key organisational values.
- There is some evidence that both business and science interviewees see corporate culture moving to a greater acceptance of the need to be sustainable.
- Despite emerging economic pressures, interviewees see sustainability as likely to increase in importance in future.
- Interviewees indicate that they would value better connections between the business and science sectors.

INTRODUCTION

Between December 2008 and February 2009 Landcare Research interviewed five leaders from the business sector (see Box 1) and five from the Research, Science & Technology (RS&T) sector (see Box 2).

The interviews were undertaken through Landcare Research's Building Capacity for Sustainable Development programme, which is public good research funded by the Foundation for Research, Science and Technology. This is part of Landcare Research's ongoing research into attitudes and understandings of the concept and practice of sustainability in New Zealand. The interviews were designed to provide input into future 'conversations' between business, science, and other stakeholder groups (such as government).

Here we present an analysis of business and science leader perceptions of sustainability issues in a way which, it is hoped, will facilitate more effective intersectoral collaborations in future.

The 2009 Budget indicated Government's intention to realign strategic priorities for science. While it is unclear as yet how this realignment will develop, we hope that this investigation, which touches on issues around science prioritisation, may serve as useful background for that process.

box 1: A BRIEF OVERVIEW OF BUSINESS ENGAGEMENT IN RS&T IN NEW ZEALAND

"Business R&D has been increasing rapidly; it grew at an annual rate of 7% from 1995 to 2004, much faster than Australia, the UK, the US and the OECD average … and 52% of firms report some form of innovation, comparable to other OECD countries.

However, despite recent growth, business R&D is still very low by international standards at 0.49% of GDP compared to the OECD average of 1.49%…and the number of patents per million inhabitants is low…suggesting that commercialisation of the research base is a challenge."

Source: Innovation and productivity: Using bright ideas to work smarter. New Zealand Treasury, Productivity Paper 08/05(2008)

"In 2006 7% of business R&D was conducted by firms in the primary sector, 52% by manufacturing firms, and 41% by firms from the service sector.

Many commentators and leaders from the business and research sectors argue that an increase in business R&D is necessary if New Zealand companies are to remain competitive worldwide.

[The Tech NZ] programme supports R&D projects that result in new products, processes or services."

Source: Ministry of Research, Science & Technology. Available at: http://www.morst.govt.nz/business/rd/

For more information see: http://www.frst.govt.nz/funding/business

METHODOLOGY

The interviews with sector leaders focused on a set of topics related to sustainability:

- The issue – how interviewees conceptualise sustainability
- Knowledge – ways of thinking and questioning around sustainability
- Visibilities – ways of representing sustainability to the outside world
- Techniques/responses – ways of acting, intervening and directing based on particular 'expertise' and 'know-how'
- Identities – ways of embodying sustainability
- Vision – the end goal or ideal that is being sought

No definition of sustainability was offered to interviewees, rather a picture of what they considered to be included in the concept emerged through a semi-structured interview format.

Interviewees were individual leaders in the business sector or the 'research, science and technology' sector. These are referred to as 'business interviewees' and 'science interviewees'. Business interviewees were selected from suggestions by Business NZ and drawn from some of New Zealand's largest companies.

box 2: A BRIEF OVERVIEW OF THE NEW ZEALAND RESEARCH, SCIENCE &TECHNOLOGY (RS&T) SECTOR

New Zealand has an RS&T sector made up of the following main research providers:

- Crown Research Institutes (CRIs) (e.g. Landcare Research, Industrial Research Limited) – owned by Government, run by independent boards.
- Universities and polytechnics – independent.
- Research Associations and others (e.g. BRANZ, Dairy NZ, Cawthron Institute) – largely privately owned.

Some providers (notably those that are privately owned) have their own funding streams. Most also compete for other private monies and for state funding.

State funding ($734 million in 2009/10) is directed through the Foundation for Research, Science and Technology (FRST), the Health Research Council (HRC) and the Royal Society. Specific programmes provide direct access to funding for business research (e.g. TechNZ). Policy direction and investment of state funding is overseen by the Ministry of Research, Science and Technology (MoRST).

MoRST and FRST interact with stakeholders, including business, to develop plans and priorities for the development, and funding, of science that reflects Government priorities and meets New Zealand's future needs.

For more information see New Zealand /New Ideas (http://www.morst.govt.nz/publications/a-z/n/nz-new-ideas/)

Science interviewees were drawn from nominations by Science NZ and the New Zealand Vice Chancellors' Committee.

The limited number of interviews conducted (10) and the limited range and size of organisations from which the interviewees were selected mean that the opinions expressed cannot be considered to be representative of business and science more generally in New Zealand. This exercise has, however, provided useful insights into areas for further discussion, elaboration, and investigation.

Interviewees often explained both their own view and the official position of their organisation. In general business interviewees spoke more on behalf of their companies, while science interviewees more commonly represented their own opinions. Quotations from the interviews are noted as being from business [B] or science [S]; individuals are not identified.

CONCEPTUALISATION OF SUSTAINABILITY

Most interviewees discuss sustainability in primarily environmental terms, but most also acknowledge social and economic elements; cultural elements of sustainability are less commonly mentioned. It may be the case that interviewees see sustainability as a primarily environmental issue; alternatively environmental issues may be most commonly cited, despite broader conceptualisations of sustainability, due to the current dominance of environmental issues, and particularly climate change, in political, social and media debates. One of the broadest views of sustainability was expressed by a science interviewee:

We do have that interest in the interaction between the economy and the environment and also between society and the environment…and of course we have got a significant interest in culture, in Māori culture in particular and its own approach to sustainable development through concepts like kaitiakitanga but also in the opportunities for Māori organisations to develop themselves and create a sustainable future for their people with their own concepts of sustainable development at the heart of that. [S]

Most interviewees describe sustainability in terms of external resources or attributes – the sustainability of the natural environment, or the sustainability of the local community for example. However, most of the interviewees also describe their organisation's sustainability, raising issues such as the need to remain economically viable (whether through sales

or state funding), to find appropriate staff, and to facilitate organisational continuity by contributing to the preservation of a stable and functional society and natural environment. A number of interviewees also commented on the long-term nature of sustainability, both in terms of external sustainability issues (like climate change) and of organisational continuity.

There is one striking difference in conceptualisation between the different interviewees. The business interviewees, when asked what sustainability meant to them, usually began with well-defined and bounded explanations of how they or their organisations view sustainability:

We have a range of products which we believe have some sustainability attributes in terms of how they are sourced and manufactured, particularly because a number of our products utilise recycled materials or utilise recycled materials as fuel. [B]

The science interviewees, on the other hand, generally began with a comment that sustainability is a very broad and contested concept and difficult to define:

…when we talk about sustainability it's very easy to put totally different interpretations on that and if we have a conversation about sustainability you could have people…almost taking opposing views but both saying…this is sustainability for New Zealand [S]

The science interviewees did go on to more narrowly describe their own work in the sustainability area, and the business interviewees did acknowledge the broadness of the sustainability concept. However, the emphases of their initial responses may be indicative of a broad spectrum of approaches to sustainability. For example, responses suggest that ambiguous concepts of sustainability may be viewed differently in different sectors and environments.

…sometimes that ambiguity around sustainability and what it means can be quite useful because it keeps everybody talking to each other [S]

…if you go to do a seminar at one of the ministries, the first thing they will ask you is…'so what should we tell our Minister to do?'… And that is such a difficult question. Business people think they have got it honed, an academic or a scientist would probably say 'well it depends'. [S]

I think in New Zealand a lot of…businesses are struggling with this notion of sustainability. I think they are kind of struggling with 'what does that actually mean?' [B]

While science interviewees appear comfortable with inherent uncertainties and cast a broad frame around the discussion, business interviewees, in general, preferred well-defined, bounded explanations and were less likely to embrace ambiguity. Given the small number of interviewees it is not possible to extrapolate these findings to wider business and science populations; indeed cultural development of science and business disciplines highlights complex links, crossovers and hybrids and, while important, is well beyond the scope of the current study.[1] Sustainability's complex and dynamic nature may require new forms of science and business cooperation in which both the objective and perceived strengths of different disciplines may be used to greater effect; the present study is but one step on that journey.

RESEARCH AND LEARNING ABOUT SUSTAINABILITY

In the context of business and science collaboration on sustainability issues a somewhat concerning picture is revealed through the interviews. The following are the first points made by each business in response to a question about the contribution that New Zealand science has made to sustainability in their organisation, sector, or the country as a whole:

Well generally I think New Zealand does science, research and technology very badly. [B]

I think that I would like to see the CRIs [Crown Research Institutes] more science oriented, rather than drifting into policy or tools or advocacy. [B]

Well [it has made] a tremendous contribution. I mean when you look at how have we as a planet become aware of the issue around climate change, well it's been born from scientists being

brought together by the IPCC [Intergovernmental Panel on Climate Change]. [B]

I think it's not a good story, not a hell of a lot to be honest. [B]

There is a problem with RS&T generally…it's not apparent what the right science is, and there isn't an incredibly authoritative source of science. [B]

The immediate reactions of four out of five business interviewees are broadly negative; the fifth notably refers to an international, rather than New Zealand, body. While this view of science is largely negative, business leaders continue to make decisions relating to sustainability and further comments reveal the factors influencing these decisions. Sustainability decisions are commonly informed by company values around 'the right thing to do', and by demand from customers (both domestic and international, as well as retail and wholesale).

I couldn't care less if somebody thinks that the science of climate change is unproven…What I do care about, though, is that our customers are increasingly concerned about those issues… whatever your private view on climate change science might be, the marketplace is making a judgment about that…and we need to be responding to that judgment. [B]

Decisions are also sometimes informed by overseas RS&T material and there is a strong suggestion from the business interviewees that science from other countries is perceived as being more reliable and of a higher quality than is New Zealand science.

…in the UK there is a thing called the Carbon Trust. I find that is the most interesting source of activity. I am now tapping in to members of the Carbon Trust to actually get resource materials and things because it's authoritative. It's non- politicised. It's good and the people are there for the right reasons. In New Zealand we don't have anything that is vaguely the equivalent. [B]

It is also acknowledged by one respondent that New Zealand science is sometimes only noticed when it has received acclaim from overseas:

I think from time to time we will read media releases of a particular research programme [that] has been world recognised…but it's almost because of that international recognition that we actually get any kind of coverage of it in the New Zealand market. [B]

This issue may relate to a lack of communication about domestic science, or it may suggest that while New Zealand science is generally not regarded highly, when a particular piece of science receives international acclaim perceptions of its quality are enhanced such that it receives recognition in New Zealand.

While the perception that New Zealand science is inferior to science from overseas may be troubling, it is tempered somewhat by anecdotal evidence suggesting that this view may not be unique to New Zealand. At a 2008 networking event for young scientists from Britain and New Zealand participants from both countries expressed that one of their motivations for taking part was to learn from the perceived superior science expertise of the participants from the other country. The potential linkage between this view expressed by young scientists and the one expressed by New Zealand business interviewees may indicate that New Zealand science is not inferior, rather that a 'grass is greener overseas' view of national science is widespread. This possibility, and the reasons for it, would be worthy of further exploration.

Science interviewees were understandably more positive about the general contribution of New Zealand science. Often, however, they spoke in the context of wider international impacts rather than of the impacts in New Zealand. One explanation for this may be that scientists commonly work within international communities of disciplinary expertise rather than regional impact. One science interviewee explains:

…most scientists…I don't think they look to benefiting New Zealand specifically, they look to benefiting the environment internationally and globally and they look to their international discipline area and impacting on that. [S]

Also issues like climate change may be considered to be most appropriately addressed at an international level, for example through collaborative processes such as the Intergovernmental Panel on Climate Change.

Interviewees did explain some of the problems that they felt to be hindering the contribution of New Zealand science. Many of these explanations (made by interviewees from both sectors) focused largely on the way in which the RS&T agenda in New Zealand is set. Prioritising one area of science over another can be difficult, as one of the science interviewees explains:

I think [it] has been a challenge for the funding agencies for science to say 'well, what are the priorities here? How much should we be investing in biodiversity versus governance structures for instance?' [S]

While some interviewees acknowledge that setting priorities for science is difficult, many are critical of the way in which priorities are perceived to be set. There is a sense that priorities are set in a manner that can be arbitrary and lack rigour, and that thereby reduces the credibility of the science voice and its strategic alignment with national interest.

…it's a fragmented area so you get advocacy. You could pretty much shop a view either way and have compelling scientific support for it. [B]

We never had the debate in New Zealand around the emission trading scheme versus a carbon tax / mitigation efforts. There wasn't good economics, there wasn't good science, there was just a headlong rush to somehow be the first in the world to do something and what we ended up with, it is still sitting in limbo I guess, a bit dumb. [B]

If we start to see what motivates people sitting in universities…I can get a bigger research grant because this really is flavour of the month. Its awful how science is controlled like that but…'lets put a whole lot of money in it because I read it in the New Zealand Herald and saw it on Campbell Live last night'…and so we respond because you follow the money most of the time. [S]

We don't have a decent energy strategy in New Zealand, we don't have an R&D strategy coming off that strategy. So there is a lack of coherency in terms of energy and therefore sustainability from top to bottom in my view. [S]

Several interviewees suggested that it would be appropriate to set science priorities in support of national strategies, but the messages around this were mixed, with others advocating for a non-political science prioritisation process.

Despite the perceived limited relevance of New Zealand science, both business and science interviewees placed value on networking and better relationships between the business and science communities.

…something we are missing is a bunch of like-minded businesses and NGOs and science organisations that are working together with a reasonably non-politicised agenda. [B]

I think of the importance of enabling a conversation that can lead to real creativity and research and those sorts of things which I think are all covered in the sustainability agenda. They seem to me to be pivots for the success of our business. [B]

[It's important for science to do] more than just doing some research and publishing it in Nature or a local journal or something; its actually going that extra step of…interacting with the people that need the information as the research progresses and in fact as the research questions are formed up, right through to talking with them about the results and what they mean. [S]

REPRESENTING SUSTAINABILITY OUTSIDE AN ORGANISATION

Most of the interviewees commented that customer perceptions of sustainability influence their work in the sustainability area. Businesses are influenced both by retail and wholesale customers, and science organisations are influenced by demand from research users and funders, as well as, in the case of universities, by demand from students and the potential future employers of those students. The business interviewees in particular referred to a need to be perceived by those outside their businesses as taking action on sustainability in order to maintain market position.

…obviously with climate change being such a massive global issue…it's important that we are seen as doing our bit for climate change to keep us competitive on the global scale. [B]

…we have to be competitive in all regards including hav[ing] good sustainability credentials…in more recent times we are starting to see more and more demand from our customers for sustainability. [B]

Despite this demand there was also a clear recognition that actively using sustainability credentials as a marketing tool can expose an organisation to risk.

We have got a rival company...who has a very high profile around sustainability...There is no area where they are outperforming us but their profile is much higher now. I'm not accusing [them] of greenwashing but what I am saying is you have got to be careful about poking your head above a parapet unless you are absolutely sure your house is in order…I don't think we are ever going to come out and advertise ourselves as…the most sustainable company in the world or whatever. [B]

There is therefore a perceived balance between appearing sustainable to satisfy demand and attracting scrutiny through claiming leadership in the sustainability arena.

ACTING ON SUSTAINABILITY

While a considerable motivation for organisations to behave sustainably is the need to manage demand and reputational risk, both business and science interviewees also explained other drivers for acting sustainably. These include taking advantage of new business opportunities, meeting staff expectations, and alignment with the fundamental values of an organisation. Most of the interviewees commented that one of the principal motivators to take action on sustainability is a belief that it is simply 'the right thing to do'.

We want to…be a company that can always be counted on to do the right thing; in whatever theatre you are acting in, whatever the right thing might be. [B]

…sustainability is an ethic within our business, it's part of our moral fibre if you want to use that term. [S]

…we believe fundamentally it's the right thing to do for New Zealand. [B]

Around half of the interviewees (predominantly from business) also reported that the values of their staff are important to them, both because the staff hold them to account for their actions and because good sustainability performances facilitate staff recruitment.

…employees…like to see the company they are working for is doing the right thing. [B]

We have got 17,000 people…involved in various business and non-business activities. I would say a fair proportion of them have real interests in some sub-set of the sustainability space and are constantly communicating with me about things that we need to be doing and how we can take things forward. [B]

People come to work for us because they do a little bit of research on organisations and go 'wow, these guys have got a community consultative council, they have got an environmental policy, they are actively involved in the community and all these fantastic things – I would like to work for you because that's a plus'. [B]

Comments from some business and science interviewees also show that where business opportunities and the values of either staff or the company as a whole coincide, action on sustainability is easy; in contrast where values and financial business concerns are in conflict and are weighed against each other, there is less certainty that sustainability will prevail.

You can have whatever environment you are prepared to pay for. [S]

…it seems to me it will depend to the extent that the dollar, or the costs of being more sustainable, and the moral will coincide. [S]

The thing about it, and I don't want to preach to you here but why I say values and principles are so important here, principle is worth nothing until it costs you something. [B]

Perhaps it is in areas where actions on sustainability are supported by values, but are limited by conflict with financial concerns, that greater potential exists for work between business and science organisations to resolve conceptual issues and develop technologies that reduce this dissonance.

EMBODYING SUSTAINABILITY

The majority of the interviewees felt that sustainability of some kind was well embedded within their organisations; they raised some caveats relating to further progress that could be made, but, on the whole, viewed sustainability as a durable issue that is being entrenched into workplace processes, cultures and reputations.

Several drew an intriguing allusion between the way in which health and safety procedures have become embedded in their workplaces, and the process that appears to be currently underway with embedding sustainability procedures.

…when I was a young student doing jobs he would say 'you climb along that beam there', 'well can I have a harness or something?' '…just get up there and do it'. But there has been this whole cultural shift now where…the roughest, toughest guy, he wants to have his…rights to health and safety protected. So that is a… a quantum shift or a paradigm shift…and it just seems…it's the same thing with…sustainability. [S]

Interviewees saw that health and safety began as a regulatory issue for organisations but is increasingly moving to a value position where protecting the well-being of employees is considered the normal course of action. That several interviewees drew this parallel may suggest that there are workplace cultural changes in progress in terms of both health and safety and sustainability.

…if I compared [sustainability] to health and safety within our company, [the] level of divergence around priority and urgency is probably still a bit greater than what it would be around health and safety. Health and safety, pretty much everyone is on the same message…There is a very deep commitment to saying that we have got to stop hurting our people and we have just got to keep on doing more and more about it until we have achieved our goal. The sustainability thing is not as deep rooted yet and [there is] not the same commonality of purpose. [B]

It should be remembered that the interviewees are all from relatively large organisations and their ability to speak on sustainability issues played a role in their selection for interview. The respondents may have an experience of corporate responsibility that is not shared throughout all organisations in New Zealand. Health and safety may not be embedded in other organisations in the way that these interviewees describe. This in itself reveals interesting potential to investigate the way in which different kinds of responsibility, including health and safety, sustainability, and others, become embedded in organisational procedures and values.

One respondent draws a parallel between sustainability and the awareness of kaupapa Māori that is being developed through schools' cultural programmes:

It becomes part of [young people's] life, which it wasn't for us. [S]

This respondent goes on to explain that as sustainability becomes normalised for younger generations, the culture of workplaces will continue to change. Together with the comments around health and safety this indicates that interviewees see workplace cultural change as being important to the treatment of sustainability.

SUSTAINABILITY GOING FORWARDS

Despite a perceived culture change around sustainability, interviewees commonly drew attention to the shortcomings in their organisations' sustainability actions or to the work that remains to be done. Statements like the following were particularly common:

We are not there yet. [B]

We are capable of delivering the solutions and we don't always do that as well or as quickly as we need to. [B]

I think getting the sustainability performance measures in place will sort of highlight our, I was going to say failings, not failings, but our inadequacies. [S]

These and the other somewhat self-deprecating comments recorded may be representative of a number of attitudes. Firstly, they may be (conscious or unconscious) deflectors of negative criticism from external stakeholders – a kind of helmet to wear when raising one's head above a parapet. Secondly, they may represent a mild sense of collective guilt that New Zealand organisations are not further forward in sustainability terms – a parallel perhaps to the perception that research overseas is of a higher quality than research in New Zealand. Thirdly, these comments may simply reflect that interviewees believe that considerable work remains to be done by their organisations in the sustainability arena.

Interviewees were asked where they saw their organisation going with sustainability in the future. While some commented that the agenda is likely to continue to shift and change, none reported expecting to see sustainability disappearing from New Zealand priorities; rather they saw a greater engagement with sustainability in coming years.

Referring to the immediate future a number of interviewees linked progress on sustainability to the poor global economic situation. Most considered that, while the economic situation is making marketplaces tougher (and in some cases prompting uptake of new strategies with regard to investment, experimentation and product development), the situation will not lead to a significant reduction in the attention paid to sustainability. In fact, interviewees, from both business and science, were more likely to see the recession as an opportunity to review possible efficiency gains, investigate new economic and business models, and to invest in infrastructure for future sustainability gains.

Some interviewees acknowledged that not all business leaders will share their enthusiasm and optimism through tough economic times. It may be beneficial to ensure that those organisations that retain a strong focus on sustainability maintain networks which reinforce their continuing aspiration towards greater sustainability; indeed the recession may provide an incentive to move towards the kind of creative relationship between business and science that was advocated by a number of interviewees. The business–science relationship could be one of those to benefit from the consideration of new models and ways of working.

Leadership is a topic that was commonly raised in interviews, but there was limited consistency in the comments about *who* should be leading *what* and *how*. Most business interviewees felt that their business should be a leader in the sustainability arena rather than a follower. Beyond this, however, different interviewees commented on potential opportunities and responsibilities for leadership by science, business, media, government and key individuals. The lack of clarity and consistency in this area is perhaps a reflection that roles and responsibilities in the contested and rapidly changing sustainability arena remain unclear. Further dialogue between sectors may be required to investigate and communicate around roles, responsibilities and possible leaders and to create an environment for collaborative action on sustainability.

SUMMARY AND CONCLUSIONS

The interviews summarised here were designed to provide input into future conversations and collaborations between business and science. The analysis has shown that the business and science sectors have much in common, they prioritise many of the same issues, identify similar challenges, and both foresee value in better collaborations between the two sectors.

Sustainability is discussed primarily as an environmental issue by most interviewees, although social and economic sustainability are also commonly mentioned and cultural sustainability was discussed by some interviewees. Beyond this commonality there is a broad range of conceptions of sustainability with ambiguity around definitions and actions being, in this small sample, embraced more by science interviewees than by business interviewees.

One considerable area of opportunity would appear to be in facilitating collaborations between business and science in which new ways for the two sectors to work together may emerge. However, encouraging collaborations has been repeatedly shown to be extremely problematic and this may be why collaborations between business and science are not currently more common than they are. Acknowledging that differing conceptions of sustainability and differing cultures may exist in the two sectors and reference to the large volume of existing work on interdisciplinary and transdisciplinary collaboration could improve the chances of success in this area (see Key Publications and Websites for revelant links).

The current perception among business interviewees that New Zealand science has not made an effective contribution in their organisation, sector, or the country as a whole may present an obstacle to effective collaboration. In contrast though, that interviewees report that they would value such a conversation is cause for optimism and may be an indication that interviewees are keen to focus on the potential for working together. Similarly, the extensive common ground between the business and science interviewees may be helpful; in particular, the existence of a shared concern around science prioritisation processes may provide an opportunity for future dialogue. Indications that New Zealand science is not being picked up and used by business may provide scope for initial discussions around mechanisms for better engagement between the sectors.

Business and science interviewees identified similar pressures on their organisations to engage with sustainability. Pressure from customers (including research users, funders, and students) and from staff is a strong driver of sustainability actions. Equally, however, organisations seek to take advantage of emerging business opportunities and to minimise internal dissonance through aligning sustainability actions with key organisational values.

There is some evidence that interviewees see corporate culture moving to a greater acceptance of the need to be sustainable; and interviewees see sustainability as likely to increase in importance in future. The commonality of issues faced by the two sectors and the shared perception that sustainability will continue to increase in importance lend support to the proposal that greater collaboration between the two sectors would be mutually beneficial.

WANT TO FIND OUT MORE?

Contact buildingcapacity@landcareresearch.co.nz

For the Author's contact details see page ii

ACKNOWLEDGEMENTS

The research was supported in part by the Foundation for Research, Science and Technology project 'Building Capacity for Sustainable Development: The Enabling Research' (C09X0310).

We wish to thank all of the interviewees for the time, thoughts and insights which have allowed this paper to be produced.

KEY PUBLICATIONS AND WEBSITES

Ministry of Research, Science and Technology 2009. The economy, the environment and opportunities for New Zealand : A futures resource. Available from: www.morst.govt.nz.

Pohl C 2005. Transdisciplinary collaboration in environmental research. Futures 37: 1159–1178.

Shapin S 2008. The Scientific Life: A moral history of a late modern vocation. Chicago, The University of Chicago Press.

Stilgoe J 2009. Citizen scientists: reconnecting science with civil society. London, Demos. Available from: http://www.demos.co.uk/publications/citizenscientists.

REFERENCES

1 See particularly Chapter 7, 'The Scientific Entrepreneur' in Shapin S 2008, The Scientific Life: A moral history of a late modern vocation. Chicago, The University of Chicago Press.

Published January 2010

Landcare Research
Manaaki Whenua

Sustainable development

Responding to the research challenge in NZ

CHAPTER 29 : HATCHED

Richard F. S. Gordon

Summary

In New Zealand, three questions facing us relate to the theme of 'Sustainable development: a challenge for research':

1. What is the relevance of a sustainable development research agenda to an island nation of 4 million people in the grip of a global economic crisis?
2. How may we guide our precious investment in research, science and technology so as to maximise the return to the nation?
3. What are priorities for investment in sustainable development research?

The answers to the three questions are interlinked and they reflect several realities:

- That research in New Zealand is a tiny proportion of the global whole, but New Zealand can be a laboratory for the world
- That our research resources are limited, so what we do must have impact
- That achieving impact in complex systems comes from influencing paradigms and mechanisms of governance;[1] and that different peoples have different world views and approaches to governance

This chapter explores answers to those three questions, finding direction in the way New Zealand science is funded and the opportunities for New Zealand to act as a laboratory for global solutions. Four research themes are discussed under the priority of governance for sustainable development. These are futuring for agile organisations, resilient and adaptive communities, post-regulatory governance, and governance models from indigenous communities.

This chapter is based on a paper given at a conference organised under the Czech Presidency of the European Union entitled: *Sustainable Development – a Challenge for European Research*, 26–28 May 2009, in Brussels. The scientific committee conferred a Best Paper award on that paper. The judges commented that 'every research funding agency is faced by the three questions that this paper answers, but rarely does one see such a clear, concise, and coherent argument linking the answers given to them...Altogether, this research and research management agenda is…a model that other research funding agencies would do good to look at very closely.' www.ec.europa.eu/research/sd/conference/

QUESTION 1: RELEVANCE OF A SUSTAINABLE DEVELOPMENT RESEARCH AGENDA

What is the relevance of a sustainable development research agenda to an island nation of 4 million people in the face of a global economic crisis?

In 2003 the New Zealand Government issued its Programme of Action for Sustainable Development.[2] This broke new ground in our country by identifying the changes in the way we do things – and specifically in the way government acts – that will be needed to make a success of sustainable development. It described a new way of thinking and working: looking after people; taking the long-term view; taking account of the social, economic, environmental and cultural effects of our decisions; and encouraging participation and partnerships.

In 2007 the then Prime Minister, Helen Clark, announced an intention to make New Zealand truly sustainable. She defined the sustainability challenge as 'one of the defining global issues of the twenty-first century', and 'a challenge that New Zealand must meet to protect our nation's unique way of life and our future prosperity.' She talked of the need to share responsibility in this challenge.[3]

In 2009 New Zealand faces a similar challenge to other countries. The result of unsustainable financial practices at home and in the global community leaves us facing an economic hardship that is difficult to predict. We face a harsh reality that unsustainable behaviour is just that: *unsustainable*. The economic turmoil is a taster for the turmoil predicted as a result of unsustainable management of our environmental resources and global climate. Whether the defining issue will be climate or water, soil nutrients, or loss of biodiversity, we face an uncertain but almost certainly punishing future.

The economic crisis may support the old adage, *'it is hard to be green when you are in the red'*. Some think we may literally be unable to afford environmental measures in the short term that are necessary for long-term welfare. Therefore it is encouraging that many national economic stimulus packages appear to include environmental initiatives, for instance in clean technology.[4] But we will miss a significant lesson if we do not recognise that addressing the economic crisis may give us some of the tools we need to address a potentially greater environmental and social crisis looming in the next few decades as a result of climate change and the depletion of natural capital. It may help us to shift paradigms and improve governance systems for lasting benefit to society.

Photo- Shane Hana

Returning to our initial question: What is the relevance of a sustainable development research agenda in the face of an economic crisis? Scientists might say the crisis is an experiment in how society makes the transition from an unsustainable to a sustainable system. What is the special relevance to an island nation of 4 million people? Scientists might also say we have in Aotearoa New Zealand a useful laboratory, with clearly defined boundaries, reasonably well regulated internal conditions, fairly clear external influences, and a national characteristic attitude of 'give it a fair go', meaning that we are pragmatic and willing to try new ideas. In this laboratory we may evaluate solutions of relevance both to New Zealand and to other countries.

QUESTION 2: GUIDING INVESTMENT TO MAXIMISE RETURN

How may we guide our precious investment in research, science and technology so as to maximise the return to the nation?

One aspect of New Zealand pragmatism is evident in its approach to science funding. We conduct a tiny proportion of the world's science and we cannot afford to be expansive.

Figure 1 The braided river metaphor for integrating scientific disciplines and research user organisations in a fluid project structure to deliver intermediate and target outcomes of national benefit.

We must be focused, and we must achieve returns on research investment. We face similar challenges to other countries, demonstrated by a recent EU report on science and policy-making.[5] The report highlighted the need to ensure that EU-funded research results inform policy-making in a meaningful way. EU policymakers expressed a desire that stronger linkage should enhance the contribution of research to areas of major economic, social and scientific relevance for the EU.

For a decade or more the New Zealand government's principal funding agency, the Foundation for Research, Science and Technology (FRST), has had as a core principle that the public good research it funds must make a demonstrable contribution to outcomes of national value. Therefore research funding is targeted at projects that can show the pathway from research to such outcomes. This requires transparency around two areas in particular: *the valuation of the outcomes,* and *the pathway to uptake of research*.

Research users are usually government agencies and businesses, but also include non-governmental organisations, community groups, and other researchers. FRST's assessment criteria for research proposals that range from NZ$500,000 to upwards of NZ$20million demand such transparency.[6]

The valuation of outcomes takes a pragmatic approach by pointing to established national strategies (e.g. biodiversity) or those of sector groups (e.g. dairy sector) who are willing to co-fund research. Valuation also includes estimation of the economic value of outcomes (e.g. greenhouse gas research reducing economic liability under the Kyoto Protocol). Demonstrating the achievement of value may be problematic when, as is common, benefits are obtained after the project funding has finished. But it is possible to show that research has supported evidence-based policy-making and implementation in line with the intentions of the research proposal.

The pathway to uptake of research starts at the conception of the research programme. Evidence is expected by the funding agency of engagement between researchers and research users through the gestation of the project proposal, and this engagement may be audited by the agency when assessing the proposal. Researchers are bound by contract to deliver workshops, training programmes, publications, secondments, etc., to achieve research uptake. Research users may be bound by the same contract or a derivative, to fulfil their role in the pathway to uptake. Research programmes therefore bring together not only different disciplines in formal or informal partnerships, but also different research users, who may co-fund research components, to achieve intermediate and target outcomes of benefit to New Zealand (Fig. 1).

Research is a partnership that is best fulfilled when the team includes both researchers and research users, supported by people with a range of additional skills. Figure 2 shows the stages in a conceptual research cycle together with the skills needed to enhance the value of the research

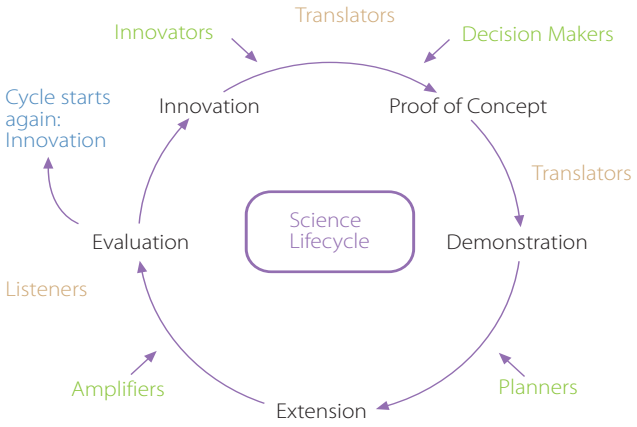


Figure 2 Schematic representation of the science lifecycle showing the phases (black), the specific skills (green) and the newly recognised interaction skills (red) that are needed in addition to the science skills.

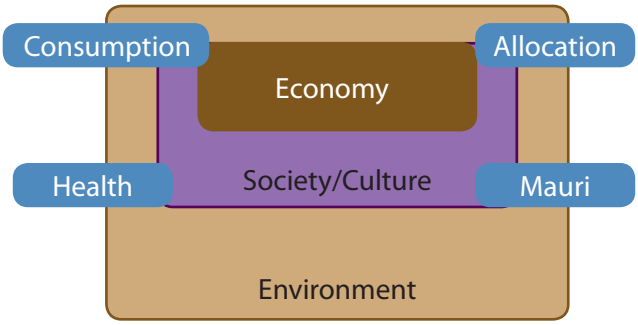


Figure 3 A nested model of the dimensions of sustainable development showing some of the cross-cutting issues associated with water. Note: mauri *is the Māori term for spirit or life-force.*

at each stage. Beyond the essential skills in science and in research management, skills are needed in *translation* (both ways between the languages of science and users, e.g. policymakers, and funders); in *decision-making* (when to increase or decrease research funding, or take a different approach); in *planning* for the longer term implementation of research findings and tools beyond the funding lifecycle; in *extension* or *amplification* of research from case studies to the mainstream; and in *listening*, *evaluation* and *collaborative learning* about the impacts of the research in its social context, from which may spring the new ideas that start the cycle again.

QUESTION 3: PRIORITIES IN SUSTAINABLE DEVELOPMENT RESEARCH

What are priorities for investment in sustainable development research?

The breadth of the subject defies simple analysis. Priorities for New Zealand, like other countries seeking sustainable development, extend across a wide spectrum from those deeply socio-economic to those deeply cultural and environmental, with all four dimensions represented in most priorities. Figure 3 depicts a view of how water issues overlap nested economic, social, cultural and environmental dimensions. For example, issues of water consumption and allocation touch on all four dimensions; and *mauri* (the Māori term signifying health and life-force) connects the environmental, social and cultural dimensions. This approach helps to break down the silos in our thinking. Economic development, Māori affairs, climate change, and water are prominent in the present New Zealand Government's agenda, and all relate to the complex challenge of achieving economic development that sustains and grows the social, environmental and cultural resources on which it depends.

In a time of great uncertainty about the future *governance for sustainable development* is a particularly relevant theme. Governance, rather like sustainability, is a term with multiple meanings. In the context of this paper the hallmarks of governance are those of effective boards of directors: attention to vision and longer term strategy, risk and opportunity, relationships with stakeholders, goal-setting, and overseeing prudence in management. Governance here relates to both business and government.

Let us explore a research agenda on governance for sustainable development, with four examples providing a New Zealand perspective. This agenda reflects consultation by Landcare Research with stakeholders about research needs in 2008 and includes both current and prospective research programmes:

- Futuring for agile organisations
- Resilience and adaptive capacity in communities
- Post-regulatory governance of constrained natural resources
- Governance models from indigenous communities

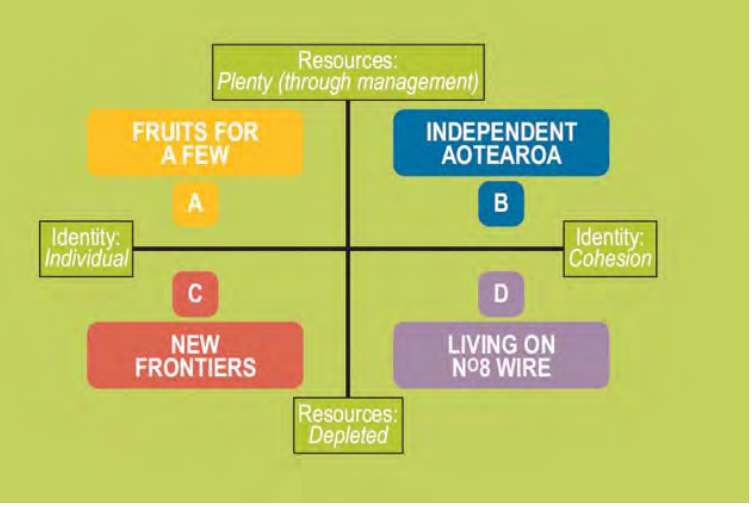


Figure 4 Four Scenarios for New Zealand.

Research theme 1: Futuring for agile organisations

Change is speeding up, increasing the pressures on central and local government to provide 'agile' responses to increasingly 'wicked' problems.[7] These are multidimensional, with messy solutions, in which uncertainty and risks are typically high, and often there is no 'right' answer.[8] Yet agile responses are required when investing strategically in infrastructure, business, and human capital against a global backdrop of significant and uncertain political, economic, social and environmental change.

The initial research question is how to adapt and combine three common futuring approaches – of global scenarios (e.g. IPCC), community visioning, and New Zealand scenarios – for a wide user-community in New Zealand and so improve the effectiveness of strategic planning for agile responses. How should organisations take a 'long view' of opportunities and challenges?

IPCC and other global climate scenarios have been adapted to provide broad-brush information about likely climate changes within New Zealand's major regions.[9] But businesses and government still lack the capacity to identify risks and opportunities to specific organisations or communities. Local government legislation has produced Long-term Council Community Plans,[10] but tools are only now in development to give territorial authorities and communities the capacity to model the implications of alternative policies for integrated environmental, social and economic outcomes. One example in New Zealand is the Creating Futures programme.[11]

An example of national futuring is Four Scenarios for New Zealand.[12] The four scenarios (named *New Frontiers, Fruits for the Few, Independent Aotearoa*, and *Living on Number 8 Wire*) occupy a matrix with axes of identity (individuality – cohesion), and resources (plentiful – highly constrained) (Fig. 4). They give a rich sense of how life could differ in the future: at work, at home, in politics, and in business. With whom will we trade? What sports will we play? How will we educate people? And what will all this mean in terms of sustainable development? Since these scenarios and a futures 'game' derived from them were developed, 34 organisations in central and local government and the private sector have been enabled to take the long view and explore futures thinking in parallel with strategy exercises.

In spite of those initiatives, contemporary 'futuring' risks being a separate exercise, not mainstreamed in strategic planning or community debate. In a series of workshops and interviews on research priorities in 2007/08, a consistent message from research users was the need to address New Zealand's lack of capacity in translating futures into strategy. We identified three opportunities: (1) to improve alignment between future scenarios and government policies such as regional development form, transport, infrastructure provision, and natural resource governance; (2) to align global economic and social trends with policies for labour and human development and the strategies of major sectors e.g. agriculture; and (3) the use of futures by businesses in re-modelling to capture environmental and social opportunities, especially as organisations orient themselves into a new world order post-recession.

An initiative that has the potential to support such alignments between futures and strategy is to create a shared understanding and resource base of future scenarios relevant to New Zealand. This has the potential to improve the quality of strategic planning, reduce the inevitable duplication of effort between agencies needing such knowledge, and support those with inadequate resources or capacity for doing effective futuring. A deliverable in the pathway to uptake is to put leading international resources on future pressures and opportunities 'on every desk' in government (and other sectors), including new methods of engaging citizens in ongoing debate about future scenarios using Web2.0 and 3.0 technologies, as has been started by the European Commission.[13]

Photo - Cissy Pan

Photo - John Hunt

Research theme 2: Resilience and adaptive capacity in communities

Historically, the long-term success of cities and communities has been founded on ability to prevent or withstand shocks, such as resource scarcity and natural disasters, and adapt and capitalise on large-scale change, such as technological advances and significant demographic shifts. Today, New Zealand cities and communities face the challenge of major change, with increasing uncertainty of how forces such as economic recession, climate change, global energy shortages, and an ageing, more ethnically diverse population will interact and impact our lives.[14] Compounding this is the modern world's connectedness; a disruption in one part of the world, to financial markets or oil supplies for instance, can rapidly impact cities and communities globally.

Resilience and adaptive capacity refer to the ability to withstand disruptions and/or adapt to large-scale change with minimal loss of function. The concept can include structural adjustment or, in the event of substantive system breakdown, structural change. Resilience and adaptive capacity are determined by a combination of factors including natural and physical resources, character of infrastructure, human and social capital, collective learning ability, and governance frameworks.

Lack of resilience and adaptive capacity to disruptions and rapid change can include major job losses; deterioration of natural resources; capital losses from obsolescence in buildings, roads, and plant; the breakdown of critical infrastructural systems; social dislocation; and losses in personal and cultural identity. The aim of research is to show how such costs can be replaced with net benefits from, for example, designing adaptable infrastructure and flexible building systems, positioning communities to gain from emerging economic sectors, and strengthening community and business competitiveness with a culture of preparedness and environmental leadership.

In order to build resilience and adaptive capacity, we need to understand what factors and processes make some settlements vulnerable to disruptions and rapid change while others can adapt.[15,16] The desired national outcome is to enable local and central government to build this capacity, moving beyond the current focus on crisis events and disaster management. A framework, indicators and place-based planning tools are needed to enable New Zealand city managers and central government agencies to work with communities and gain their mandate in implementing proactive management responses to uncertain futures. Spillover benefits are anticipated in settlements adopting new economic activities and creating new jobs – with greater diversity being an adaptive response to uncertain futures.

Research theme 3: Post-regulatory governance of constrained natural resources

Sustainable use of natural resources is the foundation for primary industries that play a major role in New Zealand's national and regional economies. Dairy and meat products alone account for 33% (NZ$10.3 billion) of export income. Hydroelectricity provides over 60% of New Zealand's electricity, while other renewable energy resources are increasingly important. Equally, New Zealand's unique and spectacular environment is a primary drawcard for international tourism, which accounts for 18.5% (NZ$7.4 billion) of national income. The success of these and other industries depends in large part on their access to and use of high quality natural resources that are becoming increasingly scarce.

Apart from the economic value of natural resources, integrity of natural systems is of increasing concern to New Zealanders. Economic and other resource uses and values are increasingly coming into conflict, creating difficult problems of natural resource governance. Conflicts over water allocation are increasing, as are problems of water pollution. Development of alternative energy resources is often contentious, as are many coastal developments.

In these and many other cases, there are important and contested issues around what is physically, legally, economically, and socially feasible, and then what is desirable, in the management of common resources. Furthermore, under resource management and local government legislation, local authorities have a responsibility to recognise the incorporation of Māori perspectives in planning and decision-making, but often struggle with how to implement this effectively.

Successful natural resource governance can only be achieved through integration of social, environmental, economic and cultural dimensions. Decision-making has typically moved from an imperfect regulatory environment to a combative legal environment in the courts. Attention is becoming focused on the opportunity for post-regulatory approaches that incorporate stakeholder collaboration, consensus building, and more integrative, interdisciplinary research.[17]

A research agenda we are following is the development of an integrative framework for analysis of natural resource governance problems in terms of *efficiency, effectiveness, equity, legitimacy and scale*.[18] The research has taken an initial focus on water, but the framework and methods could be applicable to natural resource governance in many sectors and regions of New Zealand. The research draws on a wide range of scientific disciplines, using both quantitative and qualitative methods.

Quantitative models are being developed at both regional and local scales to create better understanding of the role of water in economic production. An 'integrated computable general equilibrium' model has been developed, capable of simulating the broad effects of alternative policies and alternative scenarios for economic development at the regional scale.[19] An 'agent based model' will also be developed to explore specific issues in more detail at the scale of multiple catchments.

Qualitative approaches are being used to develop a better understanding of decision-making processes around sustainable allocation and use of water resources. We are producing an institutional landscape map by examining the legal and institutional frameworks; exploring informal, or 'silent', accounts of experiences of interagency decision-making processes, including aspects of authority and institutional barriers to creating new mechanisms of regional planning; examining media representation of water issues; and analysing relevant policies from within and beyond New Zealand's shores.

Collaborative learning techniques build capability in stakeholder engagement and constructive use of scientific knowledge. Where these techniques focus on Māori issues and perspectives, Māori researchers establish and articulate Māori perspectives and knowledge on resource issues and identify appropriate governance models. This often involves finding out how stakeholders understand and interpret the 'Māori voice' with respect to natural resource governance and recommending equitable New Zealand solutions.

Research theme 4: Governance models from indigenous communities

The first humans arrived in Aotearoa New Zealand from Polynesia about 1000 years ago, populated the country, and evolved a distinct Māori culture inextricably linked with the natural and spiritual environment. Europeans first settled in New Zealand in the early 1800s, and the Treaty of Waitangi was signed with Māori chiefs in 1840 to provide Māori rights over their lands, resources, and taonga. However, under European colonisation, an intense period of Māori land alienation and confiscation of strategic resources followed until about 1940 when Māori land represented only 6% of Aotearoa New Zealand. A new era commenced in 1975 in which the Crown (New Zealand Government) recognised the resource alienation as a significant historical grievance, and entered a phase of dialogue, dispute resolution, and settlement.

The resulting compensation to Māori tribes for land and economic losses has provided many with the opportunity

to once again govern significant assets and resources (e.g. land, fisheries, property) and to build an economic, social, and cultural base on which to develop a sustainable future for their people. Indigenous Māori make up about 15% of New Zealand's population of 4 million, with about 80% of all Māori now living in urban areas. The Māori commercial asset base in 2005/06 was estimated to be worth NZ$16.5 billion representing 1.5% of the total economy (an increase of NZ$7.5 billion or 83% since 2001). Fifty-two percent of Māori commercial assets are concentrated in primary industry such as farming, forestry, fisheries, and agriculture, while 40% is in the tertiary sector, representing growing numbers of Māori who are self-employed and entrepreneurs.[20]

A significant question for many Māori organisations and businesses has been how to balance aspirations for cultural enrichment (e.g. retaining strong elements of traditional culture such as values, language and knowledge) with more modern elements of advancement, growth, commerce and economic development.[21] Our research with a number of Māori businesses[21,22] has shown that effective corporate governance is a necessary precursor to integrating cultural heritage and values into an organisation. It is also essential to have a robust organisational planning and reporting framework in which to articulate goals and outcomes, and implement, measure and report performance. Our future research seeks to support that development of governance as a New Zealand model with relevance also in a world seeking new approaches to corporate governance.

Durie[23,24] posed the broad question 'how is a Māori business distinguished from any other business?' He identified the following six key outcomes that could be used to evaluate a Māori business's contribution to Māori development and advancement:

1. *Tūhono* (aligns a Māori business to Māori aspirations through comprehensive consultation)
2. *Pūrotu* (transparency and responsibility to the wider community)
3. *Whakaritenga* (balanced motives, not just profit-making)
4. *Paiheretia* (integrated goals, using effective management)
5. *Puāwaitanga* (best outcomes within wider social, cultural, environmental and economic, perspectives and goals), and
6. *Kotahitanga* (unity and alliance that encourages cooperation).

These elements distinguish emergent Māori business. They also define a governance framework that has relevance in a world seeking a new social contract between business and society. They look to the long-term sustainable future: '*Mō tātou, ā, mō kā uri ā muri ake nei*' (for us and our children after us),[25] and they express the spirit of sustainable development: '*Manaaki whenua, Manaaki tangata, Haere whakamua*' (Care for the land, Care for the people, Go forward) – We are the guardian of our assets and community.[26]

CONCLUSION

Aotearoa New Zealand may not yet have the answers to the sustainable development challenge, despite our 100% pure, clean, green image, but:

- We have a pragmatic approach to developing research agendas and conducting research in *partnership* with research users
- Our country has the potential to be a *national laboratory* for solutions of relevance to other countries
- A *long view* and *futures* have the potential to inform our policy and strategy across sectors
- We can learn from the economic crisis to create *agility, resilience and adaptive capacity* in our organisations and communities, and
- *Māori values and practices* are helping fashion distinctive approaches towards equitable societal goals for sustainable development in this generation and beyond

If there is a personal message in this overview, it is that research helps to inform conversations, and that conversations are fundamental to governing for sustainable development. But effective conversations need people who are willing to speak and to listen; to inform and to seek to learn; to lead and to be led.

WANT TO FIND OUT MORE?

Contact buildingcapacity@landcareresearch.co.nz

For the Author's contact details see page ii

ACKNOWLEDGEMENTS

This chapter draws on the concepts and research of the Crown Research Institute Landcare Research Manaaki Whenua. In particular the author recognises Bob Frame, Claire Mortimer, Daniel Rutledge, Garth Harmsworth, James Lennox, and Michael Krausse as leading thinkers and practitioners, and the Foundation for Research, Science and Technology who fund some of the projects mentioned.

REFERENCES

1 Based on the higher leverage points (1–3) in Meadows D 1999. Leverage points: places to intervene in a system. Hartland, VT, USA, Sustainability Institute. Available at: http://www.sustainer.org/pubs/Leverage_Points.pdf
2 Department of Prime Minister and Cabinet 2003. Sustainable Development for New Zealand: Programme of Action. Available at: http://www.mfe.govt.nz/publications/sus-dev/sus-dev-programme-of-action-jan03.html
3 Helen Clark in Voices for Sustainability. Available at:http://www.landcareresearch.co.nz/sustainability/sustainabilty_details.asp?Sustainability_ID=59
4 For example, 'Green technologies win UKP1.4billion in UK budget' in Nature, 22 April 2009. Available at: http://www.nature.com/news/2009/090422/full/news.2009.392.html
5 Directorate-General for Research, Socio-economic Sciences and Humanities 2008. Scientific evidence for policy making EUR22982 EN. Available at: http://ec.europa.eu/research/social-sciences/policy-publications_en.html
6 For an example of the funding portfolios and description of assessment criteria, see:http://www.frst.govt.nz/files/RfP%20Part%201%20Infrastructure%20Communities%20and%20Energy%20(ICE).pdf
7 Demos WJ, State Services Authority 2008. Towards agile government. Victoria, Australia, State Services Authority. Available at: http://ssa.vic.gov.au
8 Rayner S 2006. Wicked problems, clumsy solutions: Diagnoses and prescriptions for environmental ills. Available at: www.martininstitute.ox.ac.uk/NR/rdonlyres/C3EDD045-9E3B-4053-9229-9CF76660AAC6/645/JackBealeLectureWickedproblems.pdf
9 NIWA 2009. Regional modelling of New Zealand climate. Available at: http://www.niwa.co.nz/our-science/climate/research-projects/all/regional-modelling-of-new-zealand-climate
10 Long-term Council Community Plans are required under the Local Government Act 2002. An example is that of Environment Waikato. Available at: http://www.ew.govt.nz/policy-and-plans/Long-Term-Council-Community-Plan-Annual-Plan-and-Annual-Report/
11 Creating Futures: http://creatingfutures.org.nz/
12 *100% Pure Conjecture*', a participative game to stimulate interest in future directions for New Zealand and to aid strategic-thinking about sustainability. Available at: http://www.landcareresearch.co.nz/services/sustainablesoc/futures/about.asp
13 http://www.europa.eu/debateeurope/ is used by the European Commission to actively listen and engage in dialogue with its citizens.
14 Auckland Sustainability Framework 2007. Overarching strategic framework for local and central government decision-making in the Auckland Region. Available at: www.sustainingauckland.org.nz
15 The urban resilience prospectus: CSIRO, Australia; Arizona State University, USA; Stockholm University, Sweden. Available at: www.resalliance.org/1610.php
16 CitiesPlus: www.citiesplus.ca/
17 Gunningham N 2008. Innovative governance and regulatory design: Managing water resources. Landcare Research Contract Report LC0708/137. Available at: http://www.landcareresearch.co.nz/publications/researchpubs/water_gunningham_LC0708137.pdf
18 Adger WN, Brown K, Fairbass J, Jordan A, Paavola J, Rosendi S, Seyfang G 2003. Governance for sustainability: towards a 'thick' analysis of environmental decision-making. Environment and Planning A 35: 1095–1110.
19 Lennox JA, Diukanova O 2008. Modelling regional general equilibrium effects and irrigation in Canterbury. International Conference on Policy Modelling (Ecomod 2008), Berlin, 2–4 July. Available at: http://www.landcareresearch.co.nz/research/programme_pubs.asp?Proj_Collab_ID=94
20 Te Puni Kōkiri 2007. The Māori commercial asset base. Wellington, Te Puni Kōkiri.
21 Harmsworth GR 2006. Governance systems and means of scoring and reporting performance for Māori businesses. Landcare Research paper for Mana Taiao, Foundation for Research Science & Technology (2003–2007). Available at: http://www.landcareresearch.co.nz/research/sustainablesoc/social/indigenous_index.asp
22 Harmsworth GR, Tahi M 2008. Indigenous branding: Examples from Aotearoa – New Zealand. July 22–25, 2008 FIBEA – Fostering Indigenous Business & Entrepreneurship in the Americas Conference, Manaus, Brazi FIBEA Conference Proceedings.
23 Durie M 2002. The business ethic and Māori development. Paper presented at Maunga Ta Maunga Ora Economic Summit March 2002, Hawera, New Zealand.
24 Durie M 2003. Ngā kahui pou: launching Māori futures. Wellington, Huia.
25 Ngāi Tahu 2009. http://www.ngaitahu.iwi.nz/About-Ngai-Tahu/
26 Wakatu 2009. http://www.wakatu.org/main/Vision_and_Values/

Published January 2010

unending

Richard Gordon,
Bob Frame and
Claire Mortimer

Sustainability is unending. As a term, however, it has been problematic. We consider why that has been so and point to new forms of leadership emerging to guide society through the increasingly wicked problems that it faces.

In the course of the last six years a researcher in the programme around which this ebook is centered asked a memorable question about the value of research on recycling office waste when the real problems of the world were deprivation and insecurity. Images of children dying of starvation in war-torn Darfur and of people picking the remnants of their belongings from storm-torn towns in the Caribbean and Pacific do remind us of the scale and impact on people of the issues that comprise sustainable development. The human needs of shelter, food, security, dignity, and achievement are fundamental. Yet these needs are denied to so many because of geography, history, race, conflict, global change, or resource consumption. This is the hard edge of sustainable development. It is seemingly far removed from the reduction of office waste. Yet in both cases it is care for the land and care for the people that underlie actions to create a better world.

Human needs, now and for future generations, are central to the concept of sustainable development as defined by the Brundtland Commission in its 1987 report for the United Nations. Its report, *Our Common Future*, addressed the challenge of achieving development without unsustainable impacts on society and the environment. According to the Commission, 'Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.' Activities that are not sustainable deny those needs to one sector of human society or another – in the present or the future.

Why is it that people still struggle with the notion of sustainable development or its common simplified form, sustainability, 20 years and more after the Brundtland Commission? Why is the term sustainability problematic? Literally it means the ability to sustain, but those two parts – *sustain* and *ability* – beg questions. What do we want to sustain – our current quality of life, consumption, business, environment, or natural resources – for whom, and why? Does one person's view of what should be sustained carry greater weight than another's? And do we mean the ability of the environment to sustain us, or our ability to sustain our communities or the natural environment?

There is also an ambiguity about the term. For instance, can our Western economies be described as 'sustainable to

date' because they continue to develop 200 years on from the industrial revolution? Will new technologies that lessen environmental problems be truly sustainable if we cannot foresee the perverse impacts, as in switching crops from food use to fuel use in the case of biofuel production? Such questions do not have simple answers.

We have to recognise that sustainability is also a dynamic concept, varying across time and cultures. We live with the consequences of what previous generations thought was sustainable and valuable. While this has meant our generation has inherited treasures of heritage and culture, we have also had passed on significant costs. For example, when the possum was introduced in New Zealand to establish a fur trade in 1858 people could not anticipate the future cost to native biodiversity (loss of rare birds and damage to forests) and livestock (through the spread of bovine tuberculosis) or the cost of control, which is now around a hundred million dollars each year. In another example, today most of us buy imported products made by adults and children whose work conditions and pay rates will maintain intergenerational poverty in their communities. Although we have the knowledge, we shut our minds to it. So, in some cases we do not have the knowledge that future generations will have, while in others we have the knowledge but are unwilling to make a trade-off.

Part of the challenge in using the term is that we think of sustainability as a desired state without defining what it would look like and how we would know if we had arrived there. By definition, aspiring to sustainability means our current state is unsustainable. Should we therefore focus more upon unsustainability, and ask ourselves: 'what activities can we not sustain, what trade-offs are involved, and what could we achieve if we did not accept a win–lose trade-off as a default?' Starting with a goal of win–win (e.g. economic and social/environmental gain) puts our thinking onto a different, innovative and productive pathway.

A further dilemma is that the term sustainability is usually discussed as something separate from the mainstream activities of an organisation or policies of a government. While this trend has helped to give it an identity and profile, such use has also permitted the sense of sustainability being an option or an add-on – an approach motivated by short-term gain that may be dispensed with when circumstances change.

In spite of those challenges to sustainability as a concept, the last decade has seen the remarkable entry of sustainability thinking into mainstream business media. A Harvard Business Review article in September 2009 is significant: In *Why sustainability is now the key driver of innovation*, authors Nidomolu, Prahalad and Rangaswami comment that 'sustainability isn't the burden on bottom lines that many executives believe it to be' and 'sustainability should be a touchstone for all innovation'.

A growing number of people in our experience now make the connection between what is good for the organisation and what is good for the community and the natural environment in which it operates. For example, without integrity (i.e. health) in the ecosystems that provide the resources (e.g. clean water) and services (e.g. the cleansing of water through soil or wetland), an agricultural business dependent upon abundant clean water for irrigation will be unsustainable. Similarly, without the maintenance of human capital (i.e. knowledge and skills) in a community and the social capital that supports community development and resilience, a business working in that community will be unsustainable.

Therefore it is relatively straightforward for people in businesses to see that sustainability of the natural environment and society are critical to sustainability of their businesses. The impacts of their activities on environmental and social sustainability have direct and indirect impacts back on their business. The direct impact is likely to be through a social 'licence to operate' in the

community. This is won by being seen as a good corporate citizen and by being transparent about those aspects of the business's performance that matter to the community (Chapter 9). In this way organisations are responsible to society. That does not mean they are necessarily responsible *for* society, which is a common misrepresentation of the transparency argument.

The indirect impact of an organisation's activities occurs where, for example, the effects of the business are in another country where products are sourced or used, or where the customers make purchasing decisions based upon what they know about the business's performance. Every month the media have another example of a business that has acted in a way (and often in another country) that has adversely affected the support it enjoys from its customers.

That sustainability makes business sense is indisputable. A business cannot itself be sustainable if the communities and environments in which it operates are unsustainable. Businesses are increasingly being rewarded for addressing sustainability issues proactively. Business may contribute to unsustainability; but through innovation, investment, competition, and collaboration, business, as well as government, has a crucial role to play in achieving sustainable development of communities and improving the health of the natural environment on which it depends. In this way society's wealth is enhanced in not only economic but also social, environmental and cultural measures.

These examples highlight the strong link between business prosperity, economic growth, and issues of sustainability. They also highlight the increasingly important alignment of values between organisations and their stakeholders. In working with organisations on the theme of sustainability, often the first questions we ask are about such alignment. 'What are your organisation's values? How do those values align with those of your stakeholders? And how do they appear in your performance?'

If the fundamental purpose of business is to provide a service to society, then the sustainability agenda addresses how that service is provided (Chapter 9). How does it make its profit? If sustainability (however it is worded) is one of the organisation's values, there is an expectation that it underpins every aspect of performance. If it is an underlying value, then there is hope that it will also have the resilience to guide the organisation's leaders through some of the difficult decisions they will have to make in the near future as the issues become more complex and more urgent.

People talk about sustainability as a wicked problem (Chapter 19). The uncertainties and risks surrounding global warming, for example, are high; the strongly held and plausible alternative viewpoints of different groups are not readily (if at all) reconciled; there may be no 'right' answer; and the costs of action or inaction are likely to be high and to occur in expected as well as unexpected places. These are the hallmarks of wicked problems and they confront organisations more frequently as the potential trade-offs between economic, natural and social capital become more acute.

For many people the global situation and its wicked problems appear desperate. But the audacity of hope for sustainable business and societies also appears increasingly plausible. President Obama's election cry 'Yes we can' called people (not only in the United States) from feelings of despair and helplessness in the face of social, economic and environmental woes, to a belief that they have choices and the collective ability to sustain what they value.

A feature of wicked problems is that different types of leadership and different ways of thinking about the problems are needed for progress to be made. Where a question resolutely defies answering, a better quality question is needed. Where the tough questions have been avoided, then (in our experience) it is time to confront the 'elephant in the room'. This is the issue

– all organisations have one – that no one wants to address directly. Where all the available positions have been found wanting, a new position is needed in the uncharted space of opportunity. Where leadership by a single leader is unworkable because there are conflicting multiple interests or an absence of hierarchy, then collaborative leadership needs to be tried.

We are seeing collaborative or collective leadership emerge in which people's efforts are aligned to achieve significant goals, often beyond their own expectations. Our first example of this has been called post-regulatory governance. In many cases of environmental resource management, regulatory approaches become bogged down in costly and time-consuming legal processes that are resolved in the courts. The costs of achieving and monitoring of compliance with regulations may also become unbearable (see Chapter 21).

Post-regulatory forms of environmental governance involve a collaborative pathway for groups that have an interest in the contested resources. That pathway may include a coupling of legal systems with other approaches – stakeholder education, stakeholder-based management plans, self-governing communities, and audited self-management. Such post-regulatory governance is a form of collaborative leadership, reframing questions of ownership and rights, building trust between the participants, and sharing fundamental values including equity within and between generations.

A second example of collective or collaborative leadership is emerging within indigenous people's businesses (e.g. Māori business in Aotearoa New Zealand – Chapter 10). In this example the traditional values of the tribe are reflected in the governance and strategy of the business. Those values include a long-term interest in the well-being of grandchildren and great-grandchildren who are future beneficiaries of the business. In many cases natural assets (e.g. land, water) are held in perpetuity by the tribe and therefore must be stewarded for their long-term ability to provide for ecosystem services, cultural resilience and tribal self-determination.

The indigenous perspective recognises the connections between the people and all aspects of their surroundings, past, present and future, natural and spiritual. Although the combination of the two may lead to tensions, 'Western' business practices and indigenous values are combining in new business models in which collective leadership is conducted by the tribe and business managers. The goal is leadership in the best interests of present and future generations and the natural environment to which the people are inextricably linked. Such integrated thinking is central to sustainable development.

A third example of collaborative leadership is the Open Source Initiative that has developed software such as Linux and Ubuntu, which are made freely available as alternatives to commercial leaders' products. Enhancements to the suite of open source products are developed for the public good by members of the community and evaluated by their peers before being incorporated into the open source offering. Leadership towards the goal of an effective and continuously improving suite of software tools has been collaborative.

The Open Source model may become a template for communities building sustainability solutions through a process of open development, implementation, evaluation and continuous improvement. Open Source software development, however, is based in the academic world, while sustainability solutions will need to be based in the wider community. This is where the opportunity may lie in the fourth example of collective leadership: the online social networking community.

Within online social networking, ideas, opinions and collective action originate and are shaped through the interaction of millions of participants rather than a narrow leadership base. What was in recent years called the CNN world of rapid news dissemination, exposing organisations to widespread scrutiny, is now the Facebook world. Online social networks have the potential to become the visible hand of the market by quickly sharing knowledge of poor corporate practice, rewarding businesses, and quickly creating and spreading new

consumer demands. Social networks can also become a force in democratic decision-making – in building values, identity and knowledge – and in turn creating a public mandate for government policy and direction.

In conclusion, we reflect on a milestone in the development of sustainability thinking in New Zealand. In the years 2000 to 2004 a New Zealand group called Redesigning Resources comprised six organisations – five businesses from different sectors and one city council. The group was dedicated to exploring, understanding and implementing the principles of sustainable development and sharing their learning with others. The inaugural public conference of the group, attended by 200 people from business and government, was addressed by Ray Anderson, CEO of Interface Inc., and Paul Hawken, author of the *Ecology of Commerce* and books on natural capitalism.

These two inspirational speakers and leaders encouraged a sense of collective purpose in the Redesigning Resources group and the chief executives of the six organisations, who worked together in the following years to understand, embrace and implement the principles of sustainable development. Other chief executives at that time in New Zealand also had the benefit of hearing inspirational speakers, such as Dr Karl-Henrik Robert, founder of The Natural Step.

Leadership in New Zealand at that time could be said to come from individuals, often chief executives and business owners who might not initially have understood the word sustainability, but knew that the concept aligned with the values and aspirations they held for their organisations. By 2004, when Redesigning Resources concluded, leadership could be said to have transferred to groups including businesses who led their sectors and organisations who led their peers in government. In 2009 we are seeing the emergence of collaborative leadership across organisations, communities and national boundaries. Different groups may find different reasons to engage, but there is a collective sense that this is 'the right thing to do'.

This collective sense has the potential to overcome barriers to the uptake of sustainable practices, to change cultures within organisations, and ultimately to find solutions to deprivation and insecurity. While the recycling of office paper is trivial in comparison with global poverty, it is symbolic of a fundamental shift in thinking – to a recognition that our world has limits and that the same care for the land and the people, expressed in our simple recycling actions, can guide people along the tortuous pathway to finding solutions to those greater, wicked problems.

At the close of Ray Anderson's speech to the Redesigning Resources conference in Christchurch, New Zealand, in 2000, he set out the choices for the audience to create their future. He finished with an appeal to our country's identity and values: 'New Zealand, it's your call.' This ebook is our team's response to that appeal.

New Zealand's capability for sustainable development has most certainly hatched. What will now be the wind on which it takes flight? Will it be the values of a South Pacific nation? Will it be a greater profit margin and market share for those that develop new products, services and business models? Or will it be new forms of collaboration across society that transcend national and business boundaries?

The world is a small place and New Zealand will not be immune from the impacts that climate change, poverty or resource depletion have on other nations. When our indicators of social, environmental, economic and cultural capital are all increasing, we will say we are making progress. When we see less deprivation and greater security nationally and globally, we will say we are making a difference.

ACKNOWLEDGEMENTS

For their comments of drafts of this chapter: Warren Parker (Chief Executive) and Judy Grindell of Landcare Research, Peter Blyde (Auckland, Director of Catalyst4).

Tools and new knowledge developed in the research programme have been taken up widely in business, government and the community. But we acknowledge with respect the activities of many other individuals and organisations in developing New Zealand's capacity for sustainable development. These include the Sustainable Business Network, NZ Business Council for Sustainable Development, The Natural Step NZ, the Sustainable Households and Enviroschools programmes, the sustainability special interest group of the NZ Institute of Chartered Accountants, Office of the Parliamentary Commissioner for the Environment, leading councils notably Waitakere City Council, Auckland Regional Council and Environment Waikato but also the many innovations different councils have developed over the last six years, collaborative projects such as Redesigning Resources and Auckland Sustainability Framework, several leading Māori and non-Māori businesses, NGOs , the vast range of community initiatives and both individuals and departments in government, research and consultancy organisations.

The research programme *Building Capacity for Sustainable Development: the Enabling Research*, on which this ebook is based, was designed in 2002 to address four of the needs in this area identified by the government of the day. For sustainable development to be adopted, changes were needed in the way people think and act. We needed to:

- Take a longer term view – hence our research and development of futures and the publication of Four Futures for New Zealand (Section 1) and our later development of Regional Futures programmes (Chapter 4)
- Integrate across silos, specifically economic, social, environmental and cultural thinking and policy-making – hence our work on integrated sustainability assessment (Chapters 23 & 24), integrated spatial decision support systems for regional planning (Chapter 4), and emergent models of sustainability based on traditional values in Māori businesses (Chapter 10)
- Collaborate in new partnerships – hence our research on programmes in the community (Chapter 16), across business and government (Chapter 13) and between science and business (Chapters 12 & 28), governance (Chapters 3, 22 & 27), and stakeholder engagement (Chapter 25)
- Take account of people – hence our research on the emergence of consumerism (Chapters 14 & 15), on team building (Chapter 26), and communication (Chapter 17).