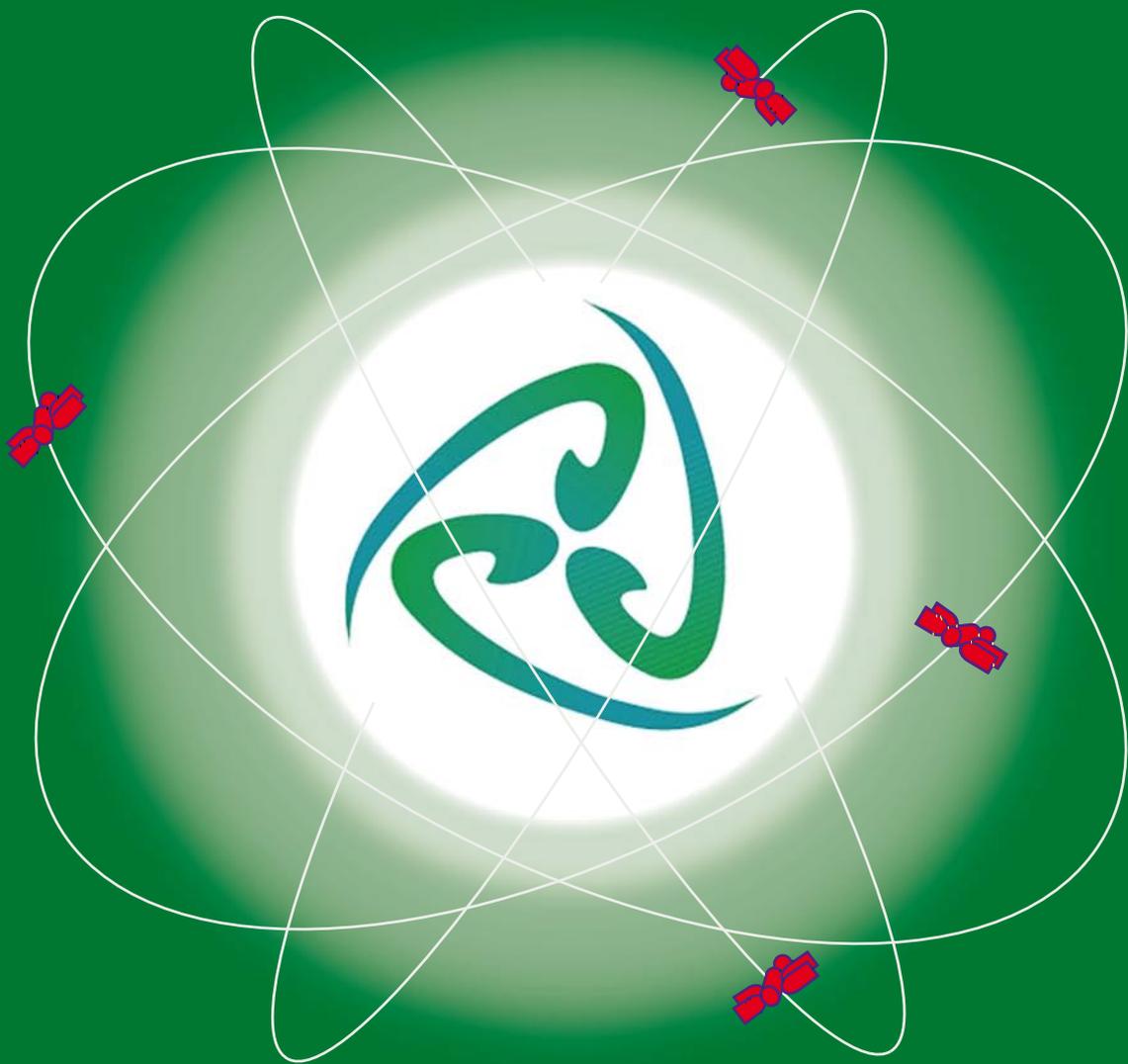


# NEW ZEALAND SURVEYOR

Journal of the New Zealand Institute of Surveyors No. 297 December 2007



- Meat and two veg – Making a meal of sustainability
- We are not sustainable yet
- Risk and consequence
- Survey, settlements and suburbs

- Land management in support of sustainability and the global agenda
- Towards sustainability
- Councils taking a sustainable development approach
- Collaborative approaches to sustainable development



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Te Rōpū Kairūri o Aotearoa



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# NEW ZEALAND SURVEYOR

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**EDITORIAL**


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**BRUCE McFADGEN**

Editor

New Zealand has reached a water-shed. This was the clear message from the 9th South-East Asian Survey Congress. Global warming and declining resources mean that New Zealand, as a community, needs to change how it lives. History is littered with societies that failed to respond constructively to their changing environment – the man who chopped down the last tree on Easter Island four centuries ago doomed his fellow islanders to a violent future. But there are also many examples of successful responses.

Global warming is not new. Since the end of the last ice age 10,000 years ago, the climate has warmed and cooled. The most recent cool spell – the Little Ice Age – ended a little over a century ago. What is new about the present warming is the apparent influence of humans through their generation of greenhouse gases. If the present warming is largely a result of human activities, then the effects are possibly reversible within a few centuries. If, however, the warming is largely a result of natural processes, then our actions trying to reduce greenhouse gases are likely to have little effect, and if the geological record is a guide, the warming could last for more than a millennium.

What will the new conditions be like? Possibly the best guide will be the previous warm periods of the last 10,000 years. The Climatic Optimum during the mid-Holocene lasted more than 2000 years, and sea level was probably about two metres higher. The new conditions will not all be doom and gloom – there are likely to be benefits for New Zealand from global warming irrespective of the cause. Archaeological evidence from around the world shows that past climate warm periods had beneficial as well as detrimental effects for human society. During the Climatic Optimum the greening of the Sahara made the desert habitable for people. During the Little Climatic Optimum 1000 years ago extreme droughts in the western United States sounded the death knell to societies in that part of the world. For New Zealand, we need to know a lot more about the effects of the Climatic Optimum and the Little Climatic Optimum. What was happening in the New Zealand landscape during those times – where was the rainfall, where were the droughts, how large was the temperature shift, what was the effect on plants, were there more storms and how did the storms affect the landscape?

The important issue may not just be about ameliorating the global warming, but rather, how to adapt to it – where and how, for example, will our communities live – an issue of considerable interest to the surveying community in New Zealand. The coast is a very desirable place, and has been for 700 years, but it can also be very dangerous. If climate warming results in rising sea levels, then expect the coast to be flooded and parts of it to wash away. People live on flood plains – which are called flood plains because they flood – if an increase in storminess is a consequence of climate warming, it then makes sense for people to move away from some flood plains. Along

with climate warming is the potential for new crops. New crops might need new patterns of subdivision – changes to the established layout in order for them to be grown successfully.

The effects of global warming are compounded by declining resources. Over-use of resources has a 700 year long history in New Zealand. Extinction of the moa was irreversible. Unless a substitute for oil is found in the near future, shifting food around the country could become very expensive. Local self-sufficiency in food may become the norm. Unlike the moa, rejuvenation of our best horticultural soils, now buried beneath many hectares of residential development, is potentially reversible. The younger members of the surveying profession may yet see the clearance of houses off our best soils in the Hutt Valley, on the Heretaunga Plains, and around other major cities.

Self-sufficiency in fuel will be critical. Increased oil costs will mean increased expense to transport food around the country. Bio-fuels are not the answer. A century ago the concern in New Zealand was to find enough land to grow hay for horses. New Zealand's population is now several times what it was in 1900. Where is the land to grow fuel for the internal combustion engine when we need the land to feed and support ourselves? Higher fuel costs may lead to loss of the mobility we currently enjoy and to decline of the supermarket – will this mean a return to the neighborhood grocer, green grocer, and butcher? Re-organisation of how we live – how far apart we build our houses, how often we build neighborhood shops – will need to be re-thought.

A leadership role in implementing change is within the grasp of surveyors because, as a group, we provide the framework for developing land, and accordingly influence in a major way, how people live. New Zealand is better placed than many societies to benefit from global warming, at least in the short term. Particularly important, we have a land title system that guarantees land ownership, and is efficient at registering land ownership change. Capital is therefore readily available to engender change – which is a major advantage to the entrepreneurship that we will need to tap into – and surveyors are an important and integral part of this process. How we act in future remains to be seen, but act we must and it is important not to lose momentum – in ten years time how will we look back at what we have done to adapt to the sustainability issues raised at this congress?

The papers in this edition of the New Zealand Surveyor are a selection of the keynote speeches of the 9th South-East Asian Survey Congress. They are all by experts in their fields, and give a cross-section of what current thinking is on the topic of sustainability. They are published here as a reference, and as a stimulus for further thought and action.

## BOB FRAME

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# Meat & two veg Making a meal of sustainability

## INTRODUCTION

Tastes are changing. No longer is sustainability the acquired taste of a select few. There is now a broad public appetite for considering the future impacts of our current lifestyles and economic activity.

On the menu today I would like to serve you up two mouth-watering courses. For starters, to entice you into this offering, we will look at the global challenge. The main course – the substantial serving – is the research response needed for this challenge.

## GLOBAL ENVIRONMENTAL CHANGE

There is little doubt that planet Earth today is facing imminent peril. A paper published by the Royal Society in the UK earlier this year: noted ‘with greenhouse gases (GHG) continuing to increase, the planetary imbalance provides ample energy to melt

ice corresponding to several metres of sea level per century.’

The 2006 Stern Report predicted global temperature increases of 1°C to 5°C, compared with pre-industrial times, if levels of carbon dioxide equivalent gases in the atmosphere reach 400 to 750 ppm. Current levels are the highest the planet has experienced in the last 400,000 years – close to the 400 ppm mark and rising rapidly.

There is a path to stabilisation based on goals for reductions in carbon emissions. The problem, as Figure 1 shows, is that we are currently heading in the opposite direction. Despite Kyoto Protocol emission reduction goals, global emissions are still increasing alarmingly.

But could this, as some naysayers claim, all be just an aberration? Analysis of air pockets in Antarctica’s Law Dome ice core enables

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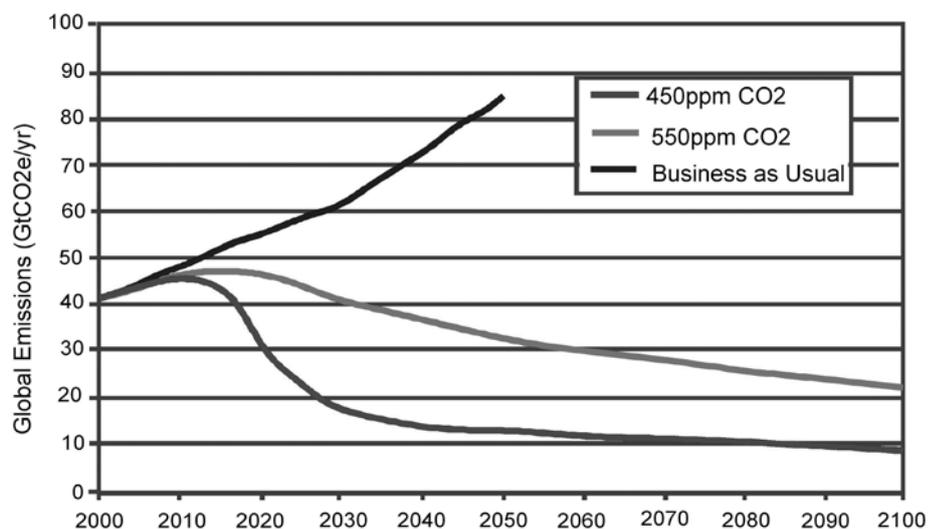
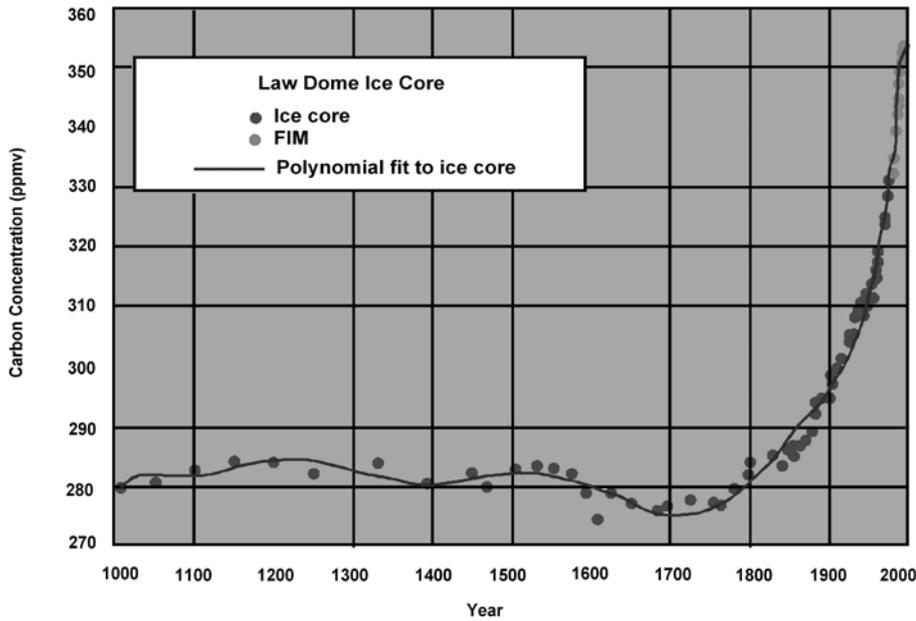


Figure 1. Emissions paths to stabilisation (after Stern 2006).



**Figure 2. Historical atmospheric carbon concentration for the last 1000 years extracted from the Law Dome ice core, Antarctica (after Etheridge et al ).**

annual finds have declined since. Ninety percent of all remaining conventional oil reserves are now in production. There is almost no easy oil left to find.

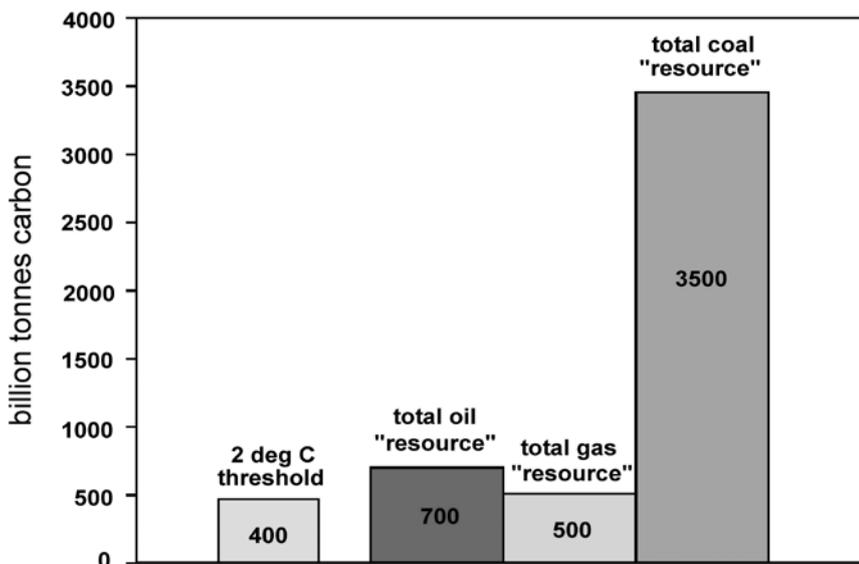
Can the climate afford oil burning? The 700 billion tonnes of carbon released from using known oil reserves alone will push us past the critical 2°C threshold for global warming (Figure 3). When you add the total carbon emissions from burning all known gas and coal reserves the situation is even more alarming. Coal in particular is not a viable alternative energy source unless carbon dioxide can be captured and kept out of the atmosphere.

It is a particularly dire prognosis for the United States with its economic dependence on oil and limited willingness or ability to do anything about it. What about other countries? China burns two billion tonnes of some of the world's dirtiest coal every year, 27 per cent of China's landmass is now desert-ified and demand for water will increase 50 per cent in the next 40 years.

Water is a critical issue for the world's most populous nation. An OECD report commissioned by the Chinese government says that 300 million Chinese people drink contaminated water every day – 30,000 die from drinking it every year. There have been 20 million known cases of respiratory illness from air pollution in the last 15 years, resulting in 600,000 deaths. One-third of all China's rivers are classified as highly polluted, as are three-quarters of all lakes and one-quarter of all coastal waters.

Good quality water is also in demand. Claridge's five-star hotel in London will sell you a bottle of '420 Volcanic' water sourced from a spring near Christchurch for the equivalent of NZ\$130 per litre. That is almost 80-times the price of petrol.

Like water use, graphs showing the number of cars produced, fertiliser and paper consumption, and the number of fisheries fully exploited, all trend upwards in line with the growing world population, which doubled in the second half of last century. Given our distance from the world's most obviously polluted countries it could be



**Figure 3. The carbon content of known oil, gas, and coal reserves, compared with the amount of carbon that would raise the earth's temperature by 2°C, if released into the atmosphere (after Vernon 2006).**

us to compare carbon dioxide levels in the atmosphere over the last 1000 years. As Figure 2 shows, readings averaged around the 280 ppm mark until the industrial age, before soaring upwards.

Assuming business as usual for the next 40 years, what will be the effect of an increase in global temperatures of at least 2°C? The US Gulf States, the Caribbean, and the Pacific Islands will be subjected to even more severe

tropical storms. Important fisheries in the North Atlantic will have depleted stocks. Parts of Africa, Asia, and South America will be affected by diminished crop yields, disease and a lack of water.

Let us look at the supply and effect of fossil fuels. Importantly, there is a 25 to 40 year delay between the discovery of an oil reserve and its peak production. Around the world, the discovery of oil peaked in the 1960s and

easy for Australians and New Zealanders to give this the ostrich treatment. But on a per-capita basis we are the world's fifth largest producer of carbon dioxide equivalent emissions. By 2005 our emissions were 37 per cent greater than the 1990 level.

### THE NEW ZEALAND CHALLENGE

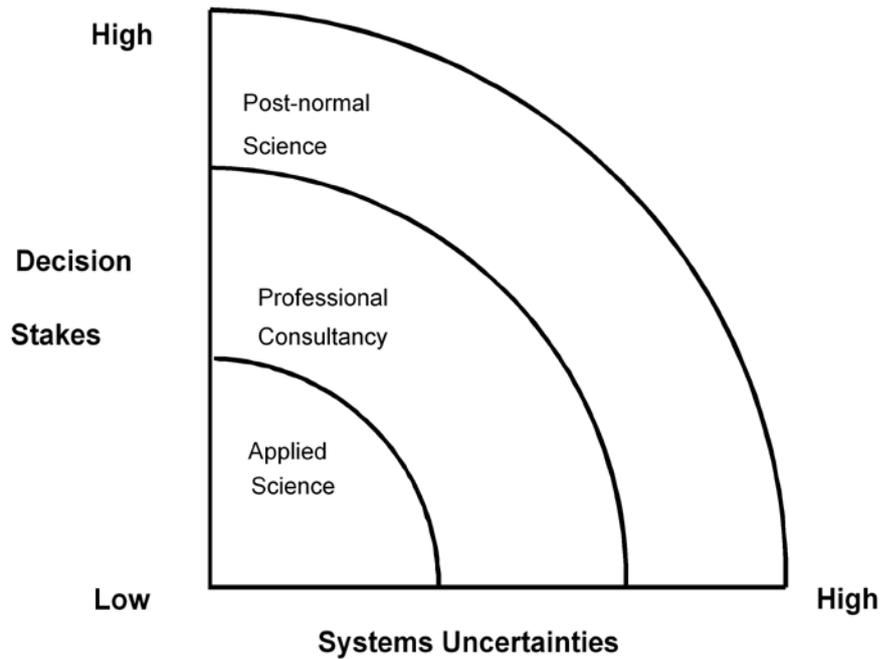
We have some unique challenges. Almost every visitor arrives by air and our exported produce is the subject of real or perceived issues around food miles and embodied water (the amount of water required to produce goods). As business commentator Rod Oram notes, New Zealand is the only country in the world trying to earn a first world living standard from our natural environment through a myriad of very small companies exporting goods halfway around the world.

We will also be affected by rising sea levels, especially if the more dire predictions are realised and the Greenland and Antarctica ice sheets melt. Severe droughts will become more frequent. At the lower end of the global warming estimates severe drought in Canterbury will reoccur every 5 to 10 years while at the upper end of estimates we can expect severe droughts every 2.5 to 5 years.

Prime Minister Helen Clark has labelled sustainability one of the defining issues of our time. She is leading long term strategies for lower GHG emissions and increased sustainability. Her goal is for New Zealand to become the world's first truly sustainable nation. There are clear targets to support the rhetoric with goals such as 90 per cent of electricity to be generated from renewable resources by 2025, transport emissions to be halved by 2040, and a net increase in forested areas of 250,000 hectares by 2020.

### THE RESPONSE

And so to the meaty main course – complex issues require comprehensive responses. Responsible governance is essential. We need smart regulation and key partnerships. A good example is the UK's Private Finance Initiatives where a contract to construct a civic building, for example, includes the contract to maintain it for 30 years,



**Figure 4. Kinds of research needed depending on how important the outcome is, and how uncertain the facts (after Funtowicz and Ravetz 1993).**

encouraging the developer to become more conscious of future costs. But such responses require good underpinning science.

We need science where research works hand-in-hand with other stakeholders. For many scientists this will mean collaborating with stakeholders with whom they have not previously worked closely. It will mean taking innovative approaches to traditional work and, in other cases, working in completely different ways.

We also need to be open to new technologies and the impacts of ethical consumerism, which is certainly prevalent in the more environmentally aware markets like Europe. Take our own CarboNZero programme. Marlborough's Grove Mill winery used the programme to become the world's first carbon neutral winery, and immediately doubled its sales to UK supermarket giant Sainsbury's. The New Zealand wine industry wants all producers operating on sustainability schemes by 2012.

### WHAT KIND OF RESEARCH IS NEEDED?

The science around global change has developed, like all new subjects, its own

terminology. Climate change events are sometimes referred to as 'strange weather' and complex issues are often termed 'wicked problems'. In tackling them, people get enmeshed in 'messy' processes before the problems get resolved into 'clumsy' solutions. All a bit of a mouthful so let's look at some in more detail and then take an example of one particular model – the Sustainability Model.

The challenge for the science community – as with all of society confronting global change – is huge. While existing science is very good, and an excellent foundation for effective professional consultancy, we need to operate in very different ways when making decisions at the next level where the decision stakes are very high and the contexts are laden with value judgements and massive uncertainties exist. This was first identified by Jerry Ravetz and Silvio Funtowicz in the early 1990s and is now becoming more widely understood. Figure 4 is the most well-known means of understanding their work.

While scientists would prefer to operate in environments where all facts are known, the reality with global environmental change

is that is not the case. Facts are uncertain, values are in dispute, and stakes are high and, most importantly, decisions are urgent. Effective modelling has a lot to offer. As the *Journal of American Statistical Information* once noted: 'all models are wrong ...but some models are useful'. We will now look at one such example.

### THE SUSTAINABILITY ASSESSMENT MODEL (SAM)

One very useful model is the Sustainability Assessment Model, the development of which was led by a New Zealander, Professor Jan Bebbington, at the University of St Andrews, in conjunction with BP (UK) and Genesis. SAM follows a four step full cost-accounting approach. First it defines the focus of the cost exercise (the cost objective) as being a discrete project such as an oil and gas field development.

Second, the boundaries of the modelling exercise have been defined widely. SAM tracks a project's sustainable development impacts over its full life cycle. For oil and gas development this starts with exploration drilling; the design of, for example, a drilling and production platform; the construction, installation and commissioning of the platform; followed by the production of oil and gas; and the eventual decommissioning of the platform. These parts of an oil and gas development are usually directly controllable by a project management team. SAM, however, extends the analysis beyond extraction of oil and gas and traces the external impacts – from refining, to the manufacture of products from oil and gas, and eventual product use. Thus SAM examines cradle-to-grave impacts of an oil and gas field.

The third aspect of SAM has been to identify and measure the impact of the project. Impacts have been examined under four headings: economic, resource use, environmental and social impacts. The activity data from which to impute impact has been drawn from the actual activities of a project such as hours worked on the project, number of people employed, number of barrels of oil produced, amount

of water used, amount of materials used in fabrication, waste produced, and estimates of the financial performance of the project. This activity data is then either used directly in the model or used to impute the economic, resource use, environmental or social impacts.

The final step undertaken has been to monetise the externalities identified as arising from the development of the oil and gas field. Monetisation is the most difficult and contentious element of full-cost-accounting, for both practical and philosophical reasons. First, for many people, the problems that sustainability development seeks to address arise from fundamental structural and spiritual problems within society. The 'deep greens' would suggest that a belief that one can reduce 'the environment' for example to a monetary figure is what has caused the environmental crisis in the first place. Hence, to seek to remedy the problem by adding more of the very thing (economic calculative rationality) that caused the problem is at best misguided. The second set of reservations over monetisation of external impacts, arise from the difficulty of obtaining a single uncontested figure for monetisation. The main approaches to monetisation, the maintenance cost approach and the variety of approaches that come under the broad heading of the damage cost approach, may yield significantly different measures of externalities. As a result, knowing what the resulting figures mean is often very difficult. In the case of SAM we have used, in the main, damage cost estimates to monetise externalities.

In summary, SAM follows a generic four step approach to full cost-accounting. The focus of the model is on a discrete project with the boundary of analysis being cradle-to-grave. Impacts are quantified in physical terms and then monetised using a variety of methods. What is being modelled is the outcome of the transformative event, in this case the development and use of an oil and gas field, as it affects capital categories.

What happens with oil and gas field exploitation is that natural resource capital,

the oil and gas, is transformed into economic benefits for the firm extracting the oil and gas and social benefits in the form of mobility, heating, and products produced from the oil and gas. At the same time social costs, such as the costs of mobility, including road deaths and congestion, and environmental costs such as global warming effects from combustion of fossil fuel, also occur. SAM seeks to model in fairly simplistic terms the changes in capitals that arise from the transformative activity.

### COMPLEXITY

The challenge we face is that we cannot model complexity. Complexity is defined by uncertainty and contradiction. But if you approximate the system to enable modelling you lose the very essence of complexity.

When we are faced with complex systems and deeply held ethical or cultural convictions we may need to use approaches that are based more on narratives than on models. This may mean a shift from quantification as a technology of trust and accountability, or of discipline and control, to one where quantification functions principally as a technology of visibility. In other words, we rely less on objective measures when dealing with highly complex issues but we may make more use of measures as indicators or pointers towards solution. An example may be that we move away from tools such as cost-benefit analysis towards deciding about building developments because there is a sound case to do so.

### CONCLUDING COMMENTS

Sustainability is going to become an increasingly important focus for virtually every discipline of science as the future is certainly unpredictable and will be highly dynamic.

So what have we learned?

- Existing science is excellent but must develop in radically new ways
- Collaboration in new ways and with stakeholders is essential
- Greater comfort is needed when dealing with 'messiness' and 'clumsiness'

- New forms of modelling and accounting for resource usage is needed such as SAM
- Complexity can be addressed through considering narrative alongside formal models

Most researchers like their science because they are attracted by the challenges and the pursuit of solutions. The challenge of sustainability is one of the most pressing issues ever faced by society and that applies to surveying as much as to any other profession.

The meal of sustainability: there is ample to chew over but it will be a satisfying feast.

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# We are not sustainable yet

## OVERVIEW

This paper addresses questions posed by the conference organisers to our panel of three. The questions are –

- 1) We are not sustainable?
- 2) What is the current and potential role of national, regional and local government in addressing this challenge and providing a sustainable development agenda?
- 3) What policies are local government finding most effective to deliver sustainable development?
- 4) What mindset do surveyors still need to make to align themselves to these policies?

The bulk of this paper will focus on designing sustainable cities reflecting my professional interests and the reality of a world that is increasingly urban – over half the world's population now lives in cities.

## WE ARE NOT SUSTAINABLE?

A compelling case for the proposition that 'we are not sustainable' has been made internationally and in New Zealand. The keynote speakers at this conference particularly Stig Enemark (Sweden) and Rob Gell (Australia) provided a comprehensive overview of the emerging international consensus regarding the seriousness of the challenges, the diversity of policy responses and the merits of designing economic and social systems that are radically more efficient in their resource use. They identified the multidimensional nature of the sustainability challenges. The key areas include –

- Energy consumption exceeding energy generation
- Population growth and rising consumption levels, exceeding the earth's carrying capacity
- End of cheap reliable oil supply
- Key environmental pressures such as water shortages, and species extinction
- Climate change, global warming.

Together these pressures make a compelling case for change from prevailing economic, social and urban development systems.

Since mid 2006 the work of Al Gore (2006), captured in his film, *An Inconvenient Truth*, and Nicolas Stern (2006), Chief Economist UK government and author of the *Stern Review Report*, an economic analysis of the costs of failure to respond and opportunities that arise from a proactive response to climate change, has secured wide public acceptance of the urgency and scale of these challenges. The release by the UN Intergovernmental Panel on Climate Change of reports which describe the likely impacts of climate change, and of a wide range of climate change linked events with severe regional impacts from heat waves to flooding, has catapulted issues of sustainability from obscurity to a central position in international and national politics.

Growing awareness of these challenges has been accompanied by increased information about the diversity of national responses to them. It is instructive for example that countries that have taken a strong interventionist approach on climate change, alternative fuels, foreign aid and social

equity such as several Nordic countries are also among the most affluent nations internationally.

### CITIES AND SUSTAINABILITY

Cities are central to the working of global and national economic systems. A majority of contemporary commentators share the views of the innovative former Mayor of Curitiba, Brazil, Jaime Lerner “that with regard to progressing sustainable development cities are not problems, they are solutions” (Worldwatch Institute 2007). He advocates a “sense of urgency is vital to positively transform our cities. The idea that action should only be taken after having all the answers and all the resources is a sure recipe for paralysis.” [op cit]. Commentators recognise that cities currently generate not only large environmental footprints but also social inequity.

As Australian urban / transport specialists Peter Newman and Jeff Kenworthy in their seminal book *Sustainability and Cities* argue, while cities currently borrow extensively from the future - and the countryside - to maintain their wealth, a wide range of knowhow exists of tools, programmes and policy frameworks, which could be applied to transform cities (Newman and Kenworthy 1999).

Newman and Kenworthy have done extensive cross national research on the relative economic, environmental and social performance of cities. They have demonstrated the relatively poor performance of cities which in the post World War II era adopted a pattern of urban growth reliant on motorised transport and low density development. This form of development flourished and delivered high average levels of wellbeing in Western countries while key inputs, especially oil remained relatively cheap and available. Under conditions where both the costs of oil and of providing infrastructure (especially transport and water systems) are rising rapidly, the “success” of this sprawling form of urban development is now widely questioned. James Kunstler (2005) who some would see as an extreme pessimist (others a realist) comments: “America finds itself nearing the end of the

cheap oil age having invested its national wealth in a living arrangement – suburban sprawl – that has no future.”

Analysts of responses to these challenges are taking the dictum of Albert Einstein to heart: “The kind of thinking that has gotten us into this situation is not the kind of thinking that will get us out of it.” While a minority view exists that people are clever and markets provide incentives for innovation and productivity gains - and that doomsayers are rarely right - a majority view now exists that there are serious resource constraints and ecological threats, and that market mechanisms need to be focussed on delivering more for less. These views are well captured in the writings of Lester Brown (2006) for example about the kind of transition required in energy, transport and waste management to avoid global decline and potential eco system collapse. Jonathan Porritt’s book, *Capitalism as if the world matters* (Porritt 2006), focuses on “retooling capitalism to deliver a sustainable future”. These writers describe the key steps required to make the shift nationally to sustainable societies.

Since 1999 some countries, and even more cities, have adopted policies and strategies to promote sustainable development. Among a long list of such cities internationally are Curitiba, Brazil (for its waste, transportation and social equity strategies), Vancouver for its transport and urban growth management approach, Melbourne for its comprehensive approach to urban growth and resource management (and more recently energy and climate change programmes). More recently cities have aligned across nations – for example the US Mayoral Coalition on Climate Change linking the climate change programmes of some 300 cities large and small from New York to Los Angeles. Under the leadership of Ken Livingstone (Mayor of Greater London) a group of 40 international cities known as C40 Climate Leadership Group, supported by the Clinton Foundation (including London, New York, Toronto and Berlin) has committed to pursuing a carbon zero future. Eighteen other leading world cities

including Beijing and Djakarta are waiting to join this grouping. Some of these cities are in countries with clear sustainability and carbon neutrality agendas. Others operate within national policy frameworks which until recently barely recognised sustainability challenges exist, characterised by risk averseness and a desire to follow, not lead change, such as the US and Australia.

The European Union have provided leadership in the introduction of alternative energy systems (wind power) and in demonstration cities such as Malmö (Sweden). Among the bolder projects internationally is the commitment of China to build near Shanghai Dongtan Eco-city “the world’s first sustainable city”. A city of 50,000 is expected to be built by 2010. Dongtan is designed to be self sufficient in energy, food and water with close to zero carbon emissions from transportation. [For further reading; see *New Scientist*, p43-45, 17 June 2006].

### NEW ZEALAND EXPERIENCE

New Zealand has taken a cautious but steady approach to addressing climate change and sustainability issues. In the past five years sustainable development has been included in influential legislation (local government, transport). The government led a series of pilot projects relating to sustainable cities, water, energy, children and youth as a means of exploring a more comprehensive approach to sustainable development. In the past 12 months the minority Labour Government has defined its aspirations “for New Zealand ... to be a truly sustainable and even carbon neutral nation” (Rt Hon Helen Clark) and has set targets for renewable energy, carbon neutrality and reduction of agricultural and transport green house gas emissions (New Zealand Government 2007).

Similarly to many other countries, many cities, regions and towns across New Zealand have taken a proactive approach to the promotion of sustainable development.

There are cities such as Waitakere and Christchurch which have committed to comprehensive sustainability strategies for

more than a decade. Some two thirds of New Zealand's population lives in cities which have committed to climate change initiatives under the Cities/Communities for Climate Change programme. Alan Milne, former Mayor of Kapiti Coast District Council (and a current member of the Institute of Surveyors) played a leading role in the evolution of this programme. Others such as Kaikoura have built their tourism/economic development brand around a comprehensive sustainability programme subject to external (Green Globe) quality control. Most Councils have initiatives which contribute to sustainability outcomes.

More recently, regional projects aligning city and regional strategies to sustainability objectives have been developed (or are in the process of development). In Auckland this is reflected the *Auckland Sustainability Framework* (Regional Growth Forum 2007) which defines "the shifts" required, in Tauranga, a smart urban growth strategy, in Wellington a comprehensive urban/economic growth strategy, in Canterbury the use of statutory mechanisms to address climate change, water and air quality issues.

At the micro level building and "suburban" level projects aimed at maximising sustainability outcomes have been completed or are being planned. Examples include Waitakere City Council's new Council building planned as part of the extension of rail services and redevelopment of Henderson, and the Housing New Zealand led plans to model best practice at Hobsonville (new build) and Tamaki / Glen Innes (redevelopment).

### FRAMEWORK FOR CHANGE

While it would be premature to claim a clear blueprint exists to move from the current approach to city planning to a more sustainable one, there are guide posts. Clearly there will be differences in approach which will reflect cultures, affordability, level of adjustment or change required (let alone the willingness to orchestrate structural change in environments where change will be resisted vigorously if a sufficient consensus

has not been built).

Some of the guide posts include –

- a. Securing agreement amongst major groups on the key changes that need to be made (for example, Regional Growth Forum 2007: Key Shifts)
- b. Identifying the characteristics of sustainable city regions. Currently there are broadly two groups of thought on what remains a contested area. The two key groups are:

*New / old urbanist school.* The key ideas are –

- Planned regional growth, compact, transit supported
- Walkable neighbourhoods
- Mixed activity / focus on "higher" (tram era) densities
- Key ecological areas protected.

[key source: Calthorpe and Fulton 2001].

*Ecologically based cities.* Such writings share much of the New/old urbanist school but also emphasise waste reduction, energy efficiency, healthy water and ecological systems.

(There is a wide range of sources on ecological cities of which Lord Richard Rogers (1997) was path breaking, and Nicholas Low et al, (2005), makes it real for an Australian audience.)

### THE IMPLICATIONS FOR SURVEYORS

So what does this mean for surveyors? What are the mindset shifts required?

Surveyors have long been shapers of landscapes. Their interventions in the past have shaped our past and contemporary cities. Surveyors are already part of the innovative practice that is occurring across the planet, whether this be in the design of wind farms, the configuration of examples of good urban design and some aspects of urban sustainability. For example in New Zealand, Harbourview- Waitakere, Earthsong-Waitakere, Flatbush- Manukau,

Addison-Papakura. They are also part of teams developing more sustainable buildings such as the Vero building in Auckland, the Department of Conservation retrofit / Ministry for the Environment buildings in Wellington.

This conference with its focus on sustainability and change is an indicator that the process of shifting mindsets in the surveying profession is already underway. However the bulk of built environment professionals' work currently contributes to business as usual city development and redevelopment.

The examination of the challenges and the experience of change suggests the following areas of focus.

1. Accepting the need to change from business as usual – designing systems that will last forever. This means looking short term and long term and taking in a big picture, holistic view as well as addressing its parts.
2. Accepting that bad decisions are difficult to rectify and have consequential effects, for example destroying eco-systems, replacing tram systems with car based systems or allowing rail networks to decay.
3. Developing a repertoire of options especially on the scale of change required. For cities this includes identifying physical and social infrastructure requirements – transit systems, water/waste water systems, social networks. This work needs to be done collaboratively within scenario frameworks which identify key risks such as climate change, energy/oil availability, which support compact urban networks and delineate no go zones. These may be at risk coastal areas, agricultural production land, and core ecological zones.
4. Appropriate choice of technology (high technology, short term financial return option may be a poor/long term choice). "Don't throw away the Stradivarius"!
5. Developing an understanding of the implications for surveyors of a changed

operating context where: “economic transformation and environmental sustainability can be seen as two sides of the same coin. (Ministry for the Environment 2007). Thought leaders in this area include Paul Hawken and Amory Lovins (Hawken et al 1999).

6. Professional education and redevelopment requirements to ensure professional surveyors receive a comprehensive understanding of the matters covered in 1–5, a potential if not current role of universities and the NZIS.
7. Adjust the profession’s focus. The UK Royal Institute of Surveyors specifically addresses sustainability objectives in its rules / ethics statements. In New Zealand the Institute of Chartered Accountants sponsors a very active Sustainability Working Group. The Institute of Professional Engineers is also proactive in this area.
8. Professional responsibility. Taking a sustainable development approach may well mean sometimes saying no to potential clients and progressively working with clients and professional partners who share the sustainability world view ethics and practices.
9. Studying models that work – of professional groupings that have

embraced the sustainability paradigm – and why they are successful. There are engineering and architectural firms that have a strong focus in this area, for example Architectus, Warren & Mahoney, Athfield Architects, Sinclair Knight Mertz (SKM), Boffa Miskell and many others.

10. Revisiting ways of thinking that integrate bodies of knowledge for optimal social and ecological outcomes. This would include works such as 60s and 70s classics, for example, Club of Rome’s *Limits to Growth* (D. Meadows 1972), Ian McHarg’s (1971) *Design with Nature*, and the swathe of writing on metropolitan systems planning from Jane Jacobs to Peter Hall.
11. Keep up with the flood of material on post carbon and sustainable cities, for example, work of Post Carbon Institute. Their recent publication – Daniel Lerch (2007) – can be ordered through the internet.

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Appointed as Principal Judge in 2003, Judge John Bollard has served on the Environment Court (earlier the Planning Tribunal) since 1998 where his judicial work has involved various cases of notable public interest including the first significant RMA offence trial and sentencing. Having practiced law in the 1970s as a civil litigation lawyer and obtaining an M Jur degree part-time (with distinction) in commercial law he began specialising in town planning in 1980. In that capacity he acted as counsel for major clients including: the Manakau City Council; University of Auckland; the then Auckland Regional Council; and a number of authorities in the Auckland area and Bay of Plenty, and has appeared extensively before the Planning Tribunal, High Court, and Court of Appeal, featuring in many reported cases. He was active in Law Society affairs, and has authored articles, particularly on the courts function and progress. He was lead speaker at the Environment Session of the Xth Commonwealth Law Conference in 1993.

# Risk and consequence

## RESOURCE MANAGEMENT ACT

Decisions of the Environment Court of New Zealand often involve findings going to matters of degree associated with the avoidance or limitation of risk of adverse effect upon the environment – attributing to ‘effect’ and ‘environment’ the wide connotations assigned under the Resource Management Act 1991 (RMA).

In this Act, unless the context otherwise requires, the term effect includes –

- (a) any positive or adverse effects; and
- (b) any temporary or permanent effect; and
- (c) any past, present, or future effect; and
- (d) any cumulative effect which arises over time or in combination with other effects –  
regardless of the scale, intensity, duration, or frequency of the effect, and also includes –
- (e) any potential effect of high probability;
- (f) and any potential effect of low probability which has a high potential impact.

Environment includes –

- (a) ecosystems and their constituent parts, including people and communities; and
- (b) all natural and physical resources; and
- (c) amenity values; and
- (d) the social, economic, aesthetic, and cultural conditions which affect the matters stated in paragraphs (a) to (c) of this definition or which are affected by those matters.

Inevitably, from the multi-faceted perspective of ‘good progress’ moulded by political and other sectors of influence, the basic aim is to serve and enhance the wellbeing of people and communities, economically, socially and environmentally. As often observed, if one of these elements of wellbeing is ‘out of kilter’ the others are consequentially affected. In such a country as New Zealand, rich in natural resources and with a relatively small but increasing population, changes in the nature and scale of human activities associated with economic growth and social demands, particularly in well-known regions where pressures are intense, will inexorably continue, thus presenting more and more environmental challenges, including ever greater competition in the use and enjoyment of finite natural resources.

The RMA’s core purpose is to promote the sustainable management of natural and physical resources. The managed use, development and protection of such resources is contemplated on an enabling footing so that “people and communities (may) provide for their social, economic, and cultural wellbeing and for their health and safety”. But enabling though the Act is, there are three qualifications imported under paragraphs (a), (b), and (c) of s. 5(2). And it is when one comes to apply those qualifications, particularly paragraph (c) (“avoiding, remedying, or mitigating any adverse effects of activities on the environment”), that the question of risk evaluation inevitably emerges as a significant issue – first, where the activity proposed is common enough and known to carry, or be susceptible to, certain risk elements; or

secondly, where the activity is comparatively unusual and the accompanying risks are not so easily defined and assessed.

### RISK ASSESSMENT AND MANAGEMENT

In assessing hazard risk whether man made or natural, the Court is dependent upon the advice and assistance of experts qualified in relevant fields. The expert witness's function is to explain logically and objectively the reasoning for the views he or she advances in order to assist the Court. The Court's function is to weigh those views and the reasons for them, along with the opinions and reasons of any counterpart experts called by other parties, and thus arrive at its own informed judgment. It is not so much a matter of deciding that one witness is wholly right and another wrong, but of coming to a judgment upon technical matters at issue, having considered all the expert views adduced bearing upon those matters, against the background of the RMA's single purpose directed to sustainability, and the guidance derivable from relevant planning instruments.

Basic questions that commonly arise, even if not precisely spelt out in every instance, may be framed in these terms.

What is the best practicable option to deal with a prescribed environmental risk from a resource management perspective? Should avoidance be aimed for in preference to mitigation, and if not, why?

How and to what extent do broad value judgment considerations, such as those stemming from matters of national importance that may be relevant under s.6 of the RMA, or from wide-ranging objective and policy provisions of relevant planning instruments, bear upon the analysis and selection of a preferred method of approach in relation to an identified risk?

Will the selected method effectively achieve the Act's purpose centered on sustainability, and be efficient in a cost/benefit context?

Efficiency in the context of economically based analysis is an important indicator in addressing those questions. The RMA looks

to economic efficiency in methods employed for achieving good environmental outcomes and in decision-making generally associated with the environment and promotion of sustainability. Yet complicating elements of value judgement have to be weighed and imported. Indeed, matters of environmental concern that often arise are not readily assessable in terms of their importance to persons and communities by reference to the pricing of possible options or to monetary values in the market place.

Risk management is dependent upon the evaluative process that the RMA contemplates. The level of tolerable risk allied to a desired environmental outcome is determinable in the course of that process, inclusive of any adjudication upon the efficiency of a particular risk management alternative by contrast with others in terms of cost. The Court's judgements generally involve evidence going to matters of degree in the avoidance or limiting of hazard risk. In cases dependent upon matters of engineering, for instance, a judgment is required on whether the proposal as designed will have that level of strength, dependability, versatility or other relevant feature, or combination of features, as to lend adequate assurance that a desired environmental outcome will be achieved consonant with the Act's purpose and subordinate instruments.

The Concise Oxford Dictionary (9<sup>th</sup> Edition) defines 'risk' as 'a chance or possibility of danger, loss, injury or other adverse consequences (a health risk; a risk of fire)'. Secondly, "a person or thing causing a risk or regarded in relation to risk" (is a risk). This second defined meaning is interesting, in that persons or things in themselves may through common belief, and understanding come to be associated with a risk, so that the risk and the person or thing are indistinguishable. Hence, the reluctance of insurance companies to provide cover for people who follow hazardous pursuits such as racing car driving or sky-diving. Asbestos may be seen as an example of a material which is regarded as a bad risk, even though the precise means by which fibres from the

material may be released and ingested with long term carcinogenic consequences is unknown to many.

Everyone appreciates that manifold types of risk are always present in one's day to day existence. Again, it may be said that the environment (remembering the wide meaning ascribed to the term under the RMA) is always under threat or at risk in various respects, depending on the particular location or feature under consideration and the activities or circumstances affecting it. Hazard risks to the environment are commonly adverted to, both as to their probability of occurrence and potential consequence, via a wide selection of descriptors ranging from infinitesimal, minimal, negligible, or very low, to major, very high, critical and extreme.

A hazard risk may be both actual and perceived, or actual but unknown, or perceived but not actual. Where the risk is actual and perceived the perception may differ from the reality – the degree of discrepancy depending on the degree of difficulty in objectively evaluating the risk and the perceiver's source of knowledge. For instance, a perceived hazard may be thought to exist in various quarters at an unwarranted level of gravity and/or likelihood of occurrence; or, conversely, be treated without sufficient attention or concern.

Sometimes a community or parts of a community may be prepared to accept, indeed embrace, an activity known to carry risk if worthwhile economic advantages may be expected notwithstanding. On the other hand, fear of the unknown may manifest itself to the point where the activity, whatever its real degree of risk or level of potential benefits, is regarded as unacceptable in the public mind.

The wide meaning of effect includes reference to any potential effect of high probability and any potential effect of low probability that has a high potential impact. The word employed is probability rather than risk, but in assessing an effect of either category the need to evaluate the risk of the

potential effect occurring arises. The Act's 4<sup>th</sup> Schedule, in specifying matters that should be included in an assessment of effects (AEE) upon the environment, states that "(w)here the activity includes the use of hazardous substances and installations, an assessment of any risks to the environment which are likely to arise from such use" is expected. And among those matters that should be considered under the same Schedule in preparing an AEE is "any risk to the neighbourhood, the wider community, or the environment through natural hazards or the use of hazardous substances or hazardous installations".

In practice, risk evaluation by the Environment Court occurs at differing levels of enquiry and sophistication in the course of assessing actual and potential effects in a myriad of fact situations. Sometimes it is necessary carefully to differentiate between the risk of harm to the environment and the question of certainty or uncertainty in terms of outcome. Obviously, high/low risk of something happening does not necessarily correlate with a high/low level of potential harm. There may, for instance, be a high likelihood that a particular hazard, whether of high or low probability as to occurrence, will result in minimal damage only. Or that, in the case of another hazard, duly analysed in terms of occurrence, significant damage will be produced.

A situation that is familiar enough to the Court, usually raised by parties who object to an especially contentious proposal, is where an activity could in theory cause or be subject to an adverse environmental effect of a material kind at some time in the future, but in remote circumstances without reliable evidence to predict the event with any certainty – and so statistically the level of assessed risk will be of commensurately low probability, and weighed accordingly.

### EXAMPLES OF RISK SCENARIOS

It is now proposed to offer a selected list of Environment Court decisions delivered during the 16-year lifetime of the RMA, in order to illustrate different types of risk

scenarios in 'real terms', and lend colour to the conceptualised discussion thus far. It should be noted that these cases are but a few alongside many others that could equally have justified citation. Some from the list were discussed and explained in comparative detail in the author's oral address at the conference enlarging upon this paper. All of them, however, are noteworthy, both as to the nature of the risks and potential consequences that the Court was called upon to consider and the reasoning applied.

#### *Earthquake risk*

Gisborne District Council & Anor v Gisborne District Council A 23/A2002

Prime Investments Limited v Gisborne District Council W 121/1995

Transwaste Canterbury Limited & Ors v The Canterbury Regional Council & Anor C29/2004

#### *Coastal hazards*

Bay of Plenty Regional Council & Anor v Western Bay of Plenty District Council 8 ELRNZ 97

Skinner v Tauranga District Council A132/2002

New Zealand Shipping Federation of New Zealand & Ors v Marlborough District Council W38/2006

#### *Eco-tourism*

Appleby v Southland Regional Council C157/2006 (interim); C81/2007(final)

Kemp and Billoud v Queenstown-Lakes District Council C229/1999

Danes Shotover Rafts v Queenstown-Lakes District Council A55/1993

#### *Geothermal issues*

Rotorua Bore Users Association Inc. v Bay of Plenty Regional Council A138/1998

Ngawha Geothermal Resource Company Limited v Northland Regional Council A117/2006

Contact Energy v Waikato Regional Council 6 ELRNZ 1

Rotokawa Joint Venture & Mighty River Power Ltd v Taupō District Council; Contact Energy Ltd v Waikato Regional Council A041/2007

#### *Mining*

Royal Forest and Bird Protection Society v Buller District Council [2006] NZRMA 193

Waihi Gold Company & Ors v Waikato Regional Council & Anor A146/1998

Patterson & Sons Limited & Ors v Bay of Plenty Regional Council A135/2000

#### *Marine farming*

Friends of Nelson Haven and Tasman Bay v Marlborough District Council W36/2006

Clifford Bay Marine Farms Limited & Ors v Marlborough District Council C131/2003

Pigeon Bay Aquaculture v Canterbury Regional Council C179/2003

#### *Communications and power transmission*

Shirley Primary School v Mobile Communications Limited [1999] NZRMA 66

Fernwood Dairies Limited v Transpower New Zealand Limited [2007] NZRMA 190

Cases where notable risk elements are involved may nonetheless be of national significance. Consequent upon an amendment to the RMA in 2005, such matters may be called in by the Minister for the Environment for direct referral to the Court, or to a board of inquiry chaired by a current, former, or retired Environment Judge. The call-in power is exercisable when the Minister considers that "a matter is or is part of a proposal of national significance." (Sections 141 B(i)(a) & (b) and 146(5)). The discretion is widely couched. In deciding upon the significance aspect, the Minister "may have regard to any relevant factor", including a range of matters listed in the empowering section. (Section 141B(ii)).

The Courts' Consolidated Practice Note ([2006] NZRMA 2007) adverts to the

possibility of direct referral by the Minister, and consequent processing under the Courts' complex case management track. As the Practice Note states –

#### 2.6 The complex track

This track applies to more complex proceedings – including all matters referred by the Minister of the Environment under s.141B ...

Matters referred to the Court by the Minister under s.141B are by definition, of national significance and likely to be complex. The likely large number of submitters, and the absence of a first instance hearing, are indicative factors that intense case management will be required.

As a learned commentator has observed (R. Sommerville QC *A Public Law Response to Environmental Risk* 10 OLR 143, 147):

“Compared with most other legislation, the RMA relies heavily on the courts, particularly the specialist Environment Court”, and subordinate legislation for its implementation. The RMA itself has very few rules for the management of natural and physical resources. Instead, it provides a framework for the making of environmental policy statements and plans by central and

local government. It is this sequential system of subordinate instruments which is intended to give legislative effect to the purpose and principles of the RMA.

Unlike other areas of judicial work, the Environment Court's function is to look ahead by seeking to make an informed assessment of what will happen in the future based on steps taken to avoid or mitigate environmental harm liable to flow from hazard risk eventualities. Few cases that come before the Court involving significant risk-based elements lack public interest and concern. The Court's decision-making task is informed and directed by the values recognised under the RMA (or other legislation relevant to a case such as the Historic Places Act). As noted in an address made earlier this year to a New Zealand Planning Institute Conference (RJ Bollard *Politics and Planning: The Independence of the Environment Court*) –

“Some cases may be of some public interest and highly charged with differing points of view. Yet despite the intensity of ‘outside debate’, possibly fuelled by media speculation, the judge's role remains constant – to hear and determine the issues at stake fairly and impartially. Principled assessment

according to law is the lodestar of judicial responsibility.”

## CONCLUSION

High-minded ideals and expectations lie at the core of the RMA founded on sustainability. In addressing hazard risks and averting unwanted losses impacting on the environment and people's wellbeing, sustainability, in the full sense of that term embraced under the RMA's broad purpose and principles, is the essential key. Some may think that sustainability involves little more than coping purposefully with the effects of climate change. In truth, the imperatives underscoring the need for sustainability have a much wider focus, and decision-making at all levels must reflect that if natural resources and environmental attributes that are popularly cherished in the generality are to be protected and maintained for the benefit of present and future generations. That is so against the ever-present calls for environmental compromises and trade-offs at the individual level, and in the light of the continual cumulative effect changes within districts and regions that all too often belatedly disclose mediocre environmental qualities in the long term sense, if not irreversible degrading outcomes.

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# Land management in support of sustainability and the global agenda

## INTRODUCTION

Arguably, sound land management is the key to achieve sustainable development and to support the global agenda set by adoption of the Millennium Development Goals. Today the accepted theoretical framework for all land administration systems is delivery of sustainable development – the triple bottom line of economic, social, and environmental development, together with the fourth requirement of good governance.

Land Administration Systems are the basis for conceptualising rights, restrictions and responsibilities related to people, policies and places. Property rights are normally concerned with ownership and tenure whereas restrictions usually control use and activities on land. Responsibilities relate more to a social, ethical commitment or attitude to environmental sustainability and good husbandry.

This paper provides an overall understanding of the concept of land administration systems for dealing with rights, restrictions, and responsibilities in future spatially enabled government. In addition, it presents the role of FIG with regard to building the capacity in this area and responding to the global agenda.

## PROPERTY RIGHTS

*“Civilized living in market economies is not simply due to greater prosperity but to the order that formalized property rights bring”*

(Hernando de Soto, 1993).

The quote is from a famous article ‘The Missing Ingredient’ in *The Economist*, September 1993. The quote may also be used as an expression of the importance that international organisations, such as the UN, FAO, and Habitat attach to building cadastral systems. The World Bank has also recognised the importance of establishing appropriate land administration systems as a basis for generating economic development, social coherence and environmental sustainability. Security in land rights is seen as a basic element in this process where land is increasingly seen as a key asset.

In the Western cultures it would be hard to imagine a society without having property rights as a basic driver for development and economic growth. Property is not only economic asset. Secure property rights provide a sense of identity and belonging that goes far beyond and underpins the values of democracy and human freedom. Historically, however, land rights evolved to give incentives for maintaining soil fertility, making land-related investments, and managing natural resources sustainably.

Therefore, property rights are normally managed well in modern economies. The main rights are ownership and long term leasehold. These rights are typically managed through the cadastral/land registration systems developed over centuries. Other rights such as easements and mortgage are often included in the registration systems.

Cadastral systems are organised in different ways throughout the world, especially with

regard to the land registration component. Basically, two types of systems can be identified: the Deeds System and the Title System. The differences between the two concepts relate to the cultural development and judicial setting of the country. The key difference is found in whether only the transaction is recorded (the Deeds System) or the title itself is recorded and secured (the Title System). The Deeds System is basically a register of owners focusing on who owns what while the Title System is a register of properties presenting what is owned by whom. The cultural and judicial aspects relate to whether a country is based on Roman law (Deeds Systems) or Germanic or common-Anglo law (Title Systems). This of course also relates to the history of colonisation.

Deeds registration is rooted in the Roman culture and is, therefore, common in Latin cultures in Europe (France, Spain, Italy, Benelux), in Latin America, and in parts of Asia and Africa who have been influenced by these cultures. The concept is also used in most of the United States but was derived from English deeds conveyancing. In the US these systems are now diversified, locally managed, and supported by private title insurance. Deeds Systems are found in different forms, where the role of the cadastral identification as well as the role of the surveyors varies significantly.

Title registration has its origin in the German culture and is found in the central European countries (Germany, Austria, and Switzerland). Different versions of the German system are found in the Eastern European and the Nordic countries. The versions relate to the use of the property concept and the organisation of the cadastral process including the use and the role of private licensed surveyors. A special version of the Title System is found in the UK, where the concept of general boundaries is used to identify the land parcels on the large-scale topographic map series. Title registration is found in a third variant, the Torrens system (developed by Sir Robert Torrens) and introduced in Australia by the mid-1800s to serve the need of securing

land rights in the New World. The Torrens System is implemented in Australia, New Zealand, Western states of Canada, and some countries in Asia and Africa.

The systems in Latin America, Africa and Asia are often mixed and rather incomplete in terms of content as well as coverage. Furthermore, some land rights cannot be recorded in Western judicial systems due to the nature of the rights. This relates to the traditional land rights on the African continent known as customary rights, and also the indigenous land rights related to the indigenous people in the American and Australian parts of the world. However, it is a misunderstanding that location of rights can only be done by defining a cadastral parcel and by a precise boundary survey (Molen 2001). The formalised western land registration systems are basically concerned with identification of legal rights in support of an efficient the land market, while the systems do not adequately address the more informal and indigenous rights.

### COMPARING CADASTRAL SYSTEMS

A website has been established ([www.cadastraltemplate.org](http://www.cadastraltemplate.org)) to compare cadastral systems on a worldwide basis. About 40 countries are currently included (August 2007) and the number is still increasing. The web site is established as a result of one of the objectives of Working Group 3 Cadastre of the PCGIAP (Permanent Committee on GIS Infrastructure for Asia and the Pacific). The cadastral template is basically a standard form to be filled out by cadastral organisations presenting their national cadastral system. The aims are to understand the role that a cadastre plays in a state or a National Spatial Data Infrastructure (NSDI), and to compare best practice as a basis for improving cadastrals as a key component of NSDIs. The Cadastral template project is carried out in collaboration with Commission 7 Cadastre and Land Management of the International Federation of Surveyors (FIG), which has extensive experience in comparative cadastral studies. (Steudler et.al. 2004).

### PROPERTY RESTRICTION

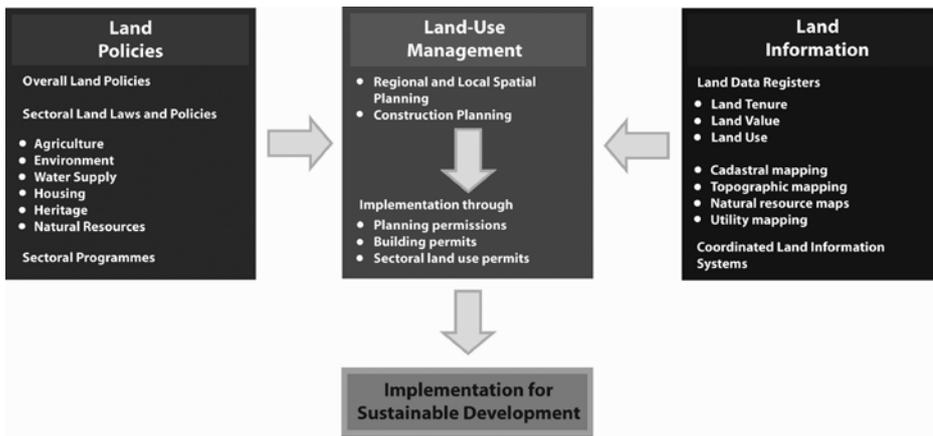
Ownership and long term leasehold are the most important rights in land. The actual content of these rights may vary between countries and jurisdictions, but in general the content is well understood. Rights to land also include the rights of use. This right may be limited through public land use regulations and restrictions, sectoral land use provisions, and also various kind of private land use regulations such as easements, covenants, etc. Many land-use rights are therefore in fact restrictions that control the possible future use of the land.

Land-use planning and restrictions are becoming increasingly important as a means to ensure effective management of land-use, provide infrastructure and services, protect and improve the urban and rural environment, prevent pollution, and pursue sustainable development. Planning and regulation of land activities cross-cut tenures and the land rights they support. How these intersect is best explained by describing two conflicting points of view – the free market approach and the central planning approach.

### THE FREE MARKET VERSUS THE CENTRAL PLANNING APPROACH

The property rights activists, most of them influenced by private ownership viewpoints, argue that land owners should be obligated to no one and should have complete domain over their land. In this extreme position, the government opportunity to take land (eminent domain), or restrict its use (by planning systems), or even regulate how it is used (building controls) should be non-existent or highly limited. Proponents argue that planning restrictions should only be imposed after compensation for lost land development opportunities is paid (Jacobs 2007).

Throughout the European territory, another view appeared. In this, the role of a democratic government includes planning and regulating land systematically for public good purposes. Regulated planning is theoretically separated from taking private



**Figure 1. Integrated land-use management for sustainable development (Enemark, 2004).**

land with compensation and using it for public purposes. In these jurisdictions the historical assumption that a land owner could do anything than was not expressly forbidden by planning regulations changed into the different principle that land owners could do only what was expressly allowed, everything else being forbidden.

The tension between these two points of view is especially felt by nations seeking economic security. The question however is how to balance owners' rights with the necessity and capacity of the government to regulate land use and development for the best of the society. The answer to this is found in a country's land policy which should set a reasonable balance between the ability of land owners to manage their land and the ability of the government to provide services and regulate growth for sustainable development.

### INTEGRATED LAND-USE MANAGEMENT

Integrated land-use management is based on land policies laid down in the overall land policy laws such as the Cadastral/Land Registration Act and The Planning/Building Act. These laws identify the institutional principles and procedures for land and property registration, land-use planning, and land development. More specific land policies are laid down in the sectoral land laws within areas such as agriculture, forestry, housing, natural resources, environmental protection, water

supply and heritage. These laws identify the objectives within the various areas and the institutional arrangements to achieve these objectives through permit procedures etc. The various areas produce sectoral programmes that include the collection of relevant information for decision making within each area. These programmes should feed into the comprehensive spatial planning carried out at national, state/regional and local level and supported by appropriate and updated land information systems. Such an integrated system of Land-Use Management for Sustainable Development is shown in Figure 1.

In the Land-Use Management System (the Planning Control System) the various sectoral interests are balanced against the overall development objectives for a given location and thereby form the basis for regulation of future land-use through planning permissions, building permits and sectoral land use permits according to the various land-use laws. These decisions are based on the relevant land use data and thereby reflect the spatial consequences for the land as well as the people. In principle it can then be ensured that implementation will happen in support of sustainable development.

### PROPERTY RESPONSIBILITIES

Property responsibilities relate to a more social, ethical commitment or attitude to environmental sustainability and good husbandry. Individuals and other actors are

supposed to treat land and property in a way that conform to cultural traditions and ways of good ethical behaviour. This relates to what is accepted both legally and socially.

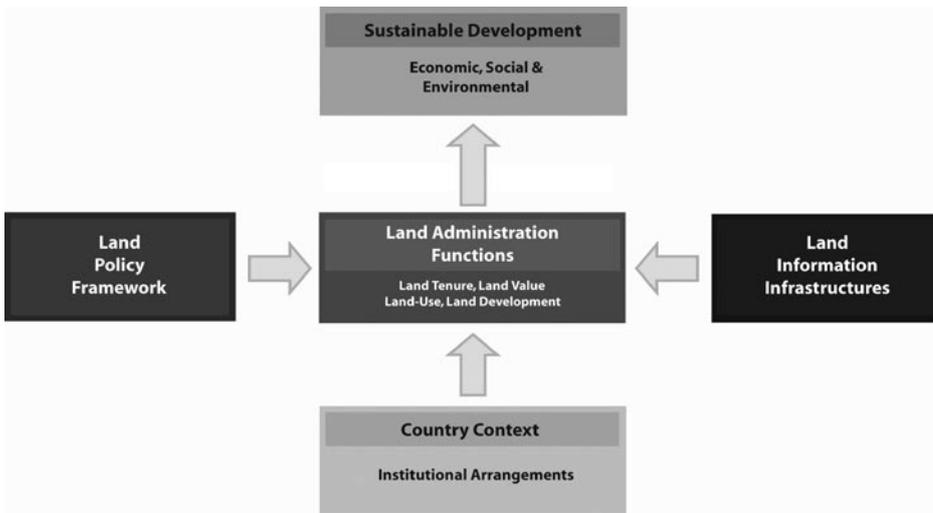
Therefore, the systems for managing the use of land vary throughout the world according to historical development and cultural traditions. More generally, the human-kind to relationship is to some extent determined by the cultural and administrative development of the country or jurisdiction.

This relates to cultural dimensions as described by the Dutch scientist Gert Hofstede, especially the dimensions of 'uncertainty avoidance', that is the preference of structured situations over unstructured or flexible ones, and 'power distance', that is the degree of inequality among people accepted by the population (Gert Hofstede, 2001). These cultural dimensions determine the social and ethical behaviour of people also in relation to the way land can be held and used within a given culture. Systems of land tenure and land-use control therefore vary throughout the world according to such cultural differences.

Social responsibilities of land owners have a long heritage in Europe. In Germany, for example, the constitution is insisting on the land owner's social role. In general, Europe is taking a comprehensive and holistic approach to land management by building integrated information and administration systems. Other regions in the world such as Australia create separate commodities out of land, using the concept of unbundling land rights, and then adapting the land administration systems to accommodate this trading of rights without any national approach (Williamson and Wallace, 2007).

### THE LAND MANAGEMENT PARADIGM

Land management underpins distribution and management of a key asset of any society namely its land. For western democracies, with their highly geared economies, land management is a key activity of both government and the private sector. Land management, and especially the central



**Figure 2. The land management paradigm (Enemark et.al, 2005)**

land administration component, aim to deliver efficient land markets and effective management of the use of the land in support of economic, social, and environmental sustainability.

The land management paradigm as illustrated in Figure 2 allows everyone to understand the role of the land administration functions (land tenure, land value, land use, and land development) and how land administration institutions relate to the historical circumstances of a country and its policy decisions. Importantly, the paradigm provides a framework to facilitate the processes of integrating new needs into traditionally organised systems without disturbing the fundamental security these systems provide.

A land administration system designed in this way forms a backbone for society and is essential for good governance because it delivers detailed information and reliable administration of land from the basic foundational level of individual land parcels to the national level of policy implementation. And the system includes all rights, restrictions and responsibilities.

### SPATIALLY ENABLED GOVERNMENT

Spatially enabled government is achieved when governments use place as the key means of organising their activities in addition to information, and when location and spatial

information are available to citizens and businesses to encourage creativity.

Google Earth is a good example of providing user friendly information in a very accessible way. We should consider the option where spatial data from Google Earth are merged with built and natural environment data. This unleashes the power of both technologies in relation to emergency response, taxation assessment, environmental monitoring and conservation, economic planning and assessment, social services planning and infrastructure planning. This also includes designing and implementing a suitable service oriented IT-architecture for organising spatial information that can improve the communication between administrative systems and also establish more reliable data based on the use of the original data instead of copies. Spatial enablement offers opportunities for visualisation, scalability, and user functionalities –

- Attachment of information to images of the parcel and property
- Identification of 'the place' in ways that are understandable by non-technical people (Google Earth)
- Capacity of businesses and citizens to manipulate the information through service oriented IT- architecture
- Integration of government information systems

- Provision of seamless information to institutions and government
- Ultimately managing information through spatially enabled systems rather than databases.

This is related to institutional challenges with a range of stakeholder interests. This includes Ministries and Departments such as justice, taxation, planning, environment, transport, agriculture, housing, interior (regional and local authorities), utilities and civil society interests such as businesses and citizens. Creating awareness of the benefits of developing a shared platform for integrated land information management takes time and patience. The mapping and cadastral agencies have a key role to play in this regard. The technical core of spatially enabling government is the spatially enabled cadastre.

### THE ROLE OF FIG

FIG is an UN recognised NGO representing the surveying profession in about 100 countries throughout the world. FIG has adopted an overall theme for the next period of office (2007-2010) entitled 'Building the Capacity'. This theme applies to the need for capacity building in developing countries to meet the challenges of fighting poverty and developing a basis for a sustainable future, and, at the same time, capacity is needed in developed countries to meet the challenges of the future in terms of institutional and organisational development in the areas of surveying and land administration.

In general, FIG will strive to enhance the global standing of the profession through both education and practice, increase political relations both at national and international level, help eradicating poverty, promote democratisation, and facilitate economic, social and environmental sustainability.

FIG can facilitate support capacity development in three ways.

**Professional development** FIG provides a global forum for discussion and exchange of experiences and new developments between member countries and between individual professionals in the broad areas of

Goal 1:	Eradicate extreme poverty and hunger
Goal 2:	Achieve universal primary education
Goal 3:	Promote gender equality and empower women
Goal 4:	Reduce child mortality
Goal 5:	Improve maternal health
Goal 6:	Combat HIV/AIDS, malaria and other diseases
Goal 7:	Ensure environmental sustainability
Goal 8:	Develop a Global Partnership for Development

**Table 1. The Millenium Development Goals.**

surveying and mapping, spatial information management, and land management. This relates to the FIG annual conferences, the FIG regional conferences, and the work of the ten technical commissions within their working groups and commission seminars. This global forum offers opportunities to take part in the development of many aspects of surveying practice and the various disciplines including ethics, standards, education and training, and a whole range of professional areas.

**Institutional development** FIG supports building the capacity of national mapping (cadastral agencies, national surveying associations and survey companies to meet the challenges of the future. FIG also provides institutional support to individual member countries or regions with regard to developing the basic capacity in terms of educational programs and professional organisations. The professional organisations must include the basic mechanisms for professional development including standards, ethics and professional code of conduct for serving the clients.

**Global development** FIG also provides a global forum for institutional development through cooperation with international NGOs such as the United Nations Agencies (UNDP, UNEP, FAO, HABITAT), the World Bank, and sister organisations (GSDI, IAG, ICA, IHO, and ISPRS). The cooperation includes a whole range of activities such as joint projects like the Bathurst Declaration and the Aguascalientes Statement, and joint policy making such as through round tables. This should lead to joint efforts of addressing topical issues on

the international political agenda, such as reduction of poverty and enforcement of sustainable development.

FIG, this way, plays a strong role in improving the capacity to design, build and manage surveying and land administration systems that incorporate sustainable land policies and efficient spatial data infrastructures.

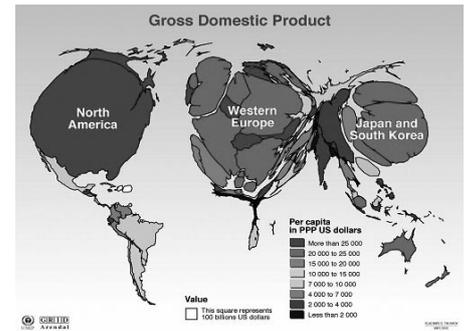
### THE GLOBAL AGENDA

FIG is strongly committed to the global agenda as presented in the Millennium Development Goals (MDGs) (UN 2000) (Table 1). Surveyors throughout the world play a key role in attaining the MDGs through their professional functions in support of an efficient land market and effective land-use management. These functions underpin development and innovation for social justice, economic growth, and environmental sustainability.

FIG is also committed to the UN-Habitat agenda around the Global Land Tool Network (GLTN) that aims to facilitate the attainment of the MDGs through improved land management and tenure tools for poverty alleviation and the improvement of the livelihoods for the poor (UN-Habitat 2006b).

The MDGs form a blueprint agreed to by all the world's countries and the world's leading development institutions. The United Nations Millennium Summit, September 2000, established a time bound (2015) to attain the MGDs that are now placed at the heart of the global agenda.

The MDGs represent a wider concept or a vision for the future, where the contribution



**Figure 3. Map of the world where the territory size is shown based on the Gross Domestic Product. (Source: UNEP).**

of the surveying community is central and vital. This relates to the areas of providing the relevant geographic information in terms of mapping and databases of the built and natural environment; providing secure tenure systems; and systems for land valuation, land use management and land development. The work of the surveyors forms a kind of backbone in society that supports social justice, economic growth, and environmental sustainability. These aspects are all key components within the MDGs.

The global challenge can be displayed through a map of the world (Figure 3) using the Gross Domestic Product as the scale of showing the territory size. In surveying terms, the real challenge of the global agenda is about bringing this map back to scale.

In a global perspective the areas of surveying and land administration are basically about –

- People, in terms human rights, engagement and dignity
- Politics, in terms of land policies and good government
- Places, in terms of shelter, land and natural resources.

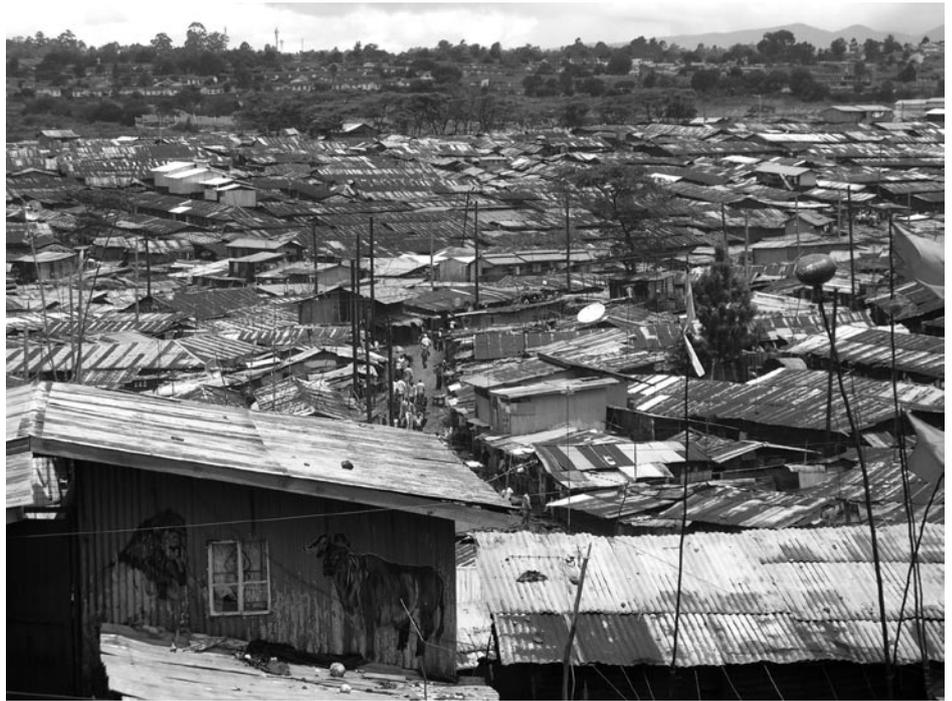
To complete the picture another 'P' should be added namely power in terms of providing equity and legal empowerment of the poor. By taking this approach FIG will pursue sustainable development in both an economic, social, governmental, and environmental sense. The role of FIG in this regard is threefold –

- To explain the role of the surveying profession and the surveying disciplines in terms of their contribution to the MDGs.
- To develop and disseminate knowledge, policies and methods towards achieving and implementing the MDGs. A number of FIG publications have already made significant contributions in this regard, and all are available on-line at the FIG website [www.fig.net/publications](http://www.fig.net/publications).
- To work closely with the UN agencies and the World Bank in merging our efforts of contributing to the implementation of the MDGs.

The MDGs serve as a visionary challenge to help garner new energies and resources for the development agenda, with a focus on outcomes. The agenda includes the basic elements for a new global partnership. FIG already shares this global responsibility and has now established a focused partnership with both the World Bank and UN-Habitat to deal with these challenges. An outcome in support of the UN-Habitat Global Land Tools Network should be ready by the second half of 2008 to be presented at the World Urban Forum in Nanjing, October 2008. This will include a special focus on developing a model for providing secure social tenure for the poorest. Another outcome will be in the areas of capacity building and good governance in land administration in support of the MDGs to be presented at a joint FIG/WB high profile conference in Washington DC in November 2008.

### PRO POOR LAND TENURE SYSTEMS

Today there are about one billion slum dwellers in the world (Figure 4). UN-Habitat estimates that the slum population will reach 1.4 billion by 2020 if no remedial action is taken. The city authorities view most people living in slums as illegal. Because of this, cities do not plan for or manage slums, and the people in them are overlooked and excluded. Conventional cadastral and land registration systems cannot supply security of tenure to the vast majority of the low



**Figure 4: Informal settlement Kibera in Nairobi, Kenya covers 150 ha for more than a million slum dwellers.**

income groups and/or deal quickly enough with the scale of urban problems (UN-Habitat 2006a).

A solution to this problem may be found in the so called Social Tenure Domain Model (STDM) originally developed as the Core Cadastral Domain Model (CCDM). The key issue here is that, in traditional cadastral systems there is often an insufficient focus on pro poor technical and legal tools. For that purpose FIG will facilitate development and testing of a prototype for such a STDM as a tool to deal with the kind of social tenure that exist in informal settlements (and also in areas based on customary tenure) that cannot be accommodated in traditional cadastral systems (Augustinus et.al. 2006).

Traditional cadastral and land registration systems deal with identification of properties and land parcels as a basis for securing legal rights such as title, leasehold, and easements. The STDM attempts to be able to deal more generally with the relation between objects (that may be a parcel, construction work, or a natural asset), subjects (that may be a person, group of people, or groups of groups), and the social tenure (including all kind of rights, restrictions and responsibilities) that is established between the object and

subject. Such a system, provided as open source software, should be available as a tool for managing the range of tenures found in informal settlement and be manageable for the local communities as well as public authorities.

### FINAL REMARKS

No nation can build land management institutions without thinking about integration of activities, policies, and approaches. Technology opportunities provide additional motivation. Careful management of land related activities on the ground are crucial for delivery of sustainability.

As stated in the introduction, land administration systems are the basis for conceptualising rights, restrictions and responsibilities related to people, policies and places. Property rights are normally concerned with ownership and tenure whereas restrictions usually control use and activities on land. Responsibilities relate more to a social, ethical commitment or attitude to environmental sustainability and good husbandry.

Land administration systems, in principle, reflect the social relationship between

people and land recognised by any particular jurisdiction or state. Such a system is not just a GIS. On the other hand, land administration systems are not an end in themselves but facilitate the implementation of the land policies within the context of a wider national land management framework. Land administration activities are not just about technical or administrative processes. The activities are basically political and reflect the accepted social concepts concerning people, rights, and land objects with regard to land tenure, land markets, land taxation, land-use control, land development, and environmental management.

Land administration systems therefore need high-level political support and recognition.

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## LINDSAY GOW

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LINDSAY GOW was trained at Victoria University of Wellington and the University of Auckland. He has been involved in resource management and environmental planning in the public sector for over thirty years. He is Deputy Chief Executive at the Ministry for the Environment, and has considerable experience in managing policy advice and leading major policy and programme initiatives. He was responsible for the development of the Resource Management Act 1991. He led the Urban Design Advisory Group responsible for developing the New Zealand Urban Design Protocol, has researched and written about urban development and sprawl, and is currently leading work on strategic urban issues in New Zealand.

# Towards sustainability

## SUSTAINABILITY

Sustainability is at the top of the agenda, both here and abroad. It is going to be the leading issue for New Zealand this century.

Sustainability is concerned with economic, environmental, social and cultural development. The Prime Minister, Helen Clark, has said "I believe New Zealand can aim to be the first country to be truly sustainable – across the four pillars of the economy, society, the environment and nationhood". The government is advancing the Prime Minister's vision by a number of linked initiatives. These include work on households, waste minimisation and management, a carbon neutral public service, enhanced sustainable procurement and related eco verification, business partnerships on sustainability, and a number of other important initiatives in the areas of transport, energy, land use and water allocation and quality.

The surveying profession and the important work it undertakes are at the front end of sustainable urban development. As we look further into the 21<sup>st</sup> century, it is highly likely that we will need to develop new design responses that are smarter and inherently eco efficient. In fact, designing for communities that are eco efficient and environmentally sustainable is going to be a mainstay of the surveying profession.

## ECO EFFICIENCY

Eco efficiency involves the integrated consideration of how land and building developments work together to minimise energy use, water use, and waste water generation and disposal. They must also provide building and housing choices, a range of transport alternatives, provide for community amenities within a range of building and housing densities, and importantly, ensure people in housing developments have easy access to diverse employment choices. A key way to meeting this new emerging and challenging demand is through practising urban design. New Zealand Institute of Surveyors is a founding member of the Urban Design Protocol. Urban design is concerned with the design of the buildings, places, spaces and networks that make up our towns and cities, and the ways people use them. If there is one critical criterion of quality urban design it is that it must work for people. Importantly, urban design is not just concerned with appearances and built form, but with the environmental, economic, social and cultural consequences of design.

Sustainable urban design involves design that reduces environmental impacts, encourages easy movement and transport and creates smart buildings and building layouts that maximise the use of sun and shade. Fostering inter-disciplinary collaboration is critical to



**Figure 1: Talbot Park permeable paving.**

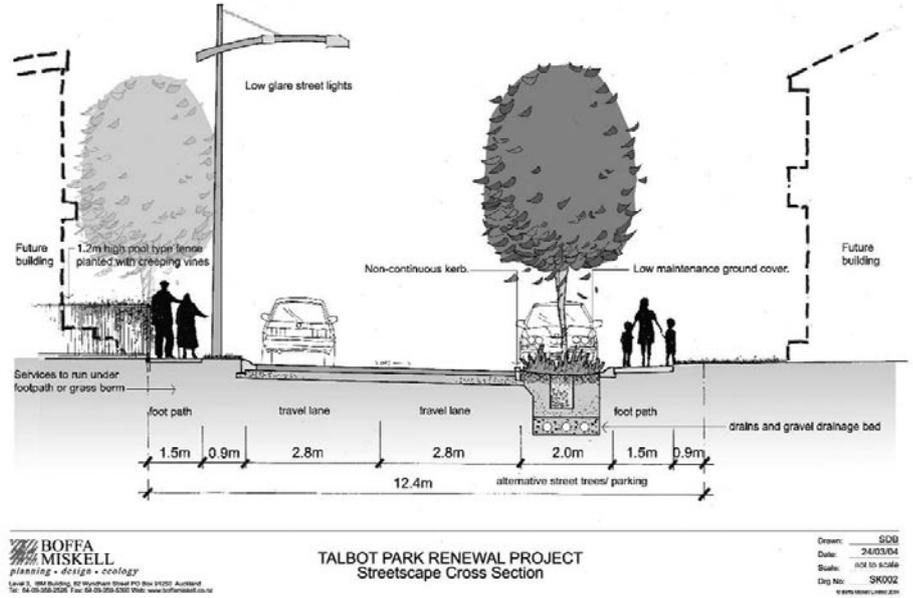
achieving these objectives. The design of new smart urban neighbourhoods made up of sections, blocks and transport networks with community spaces, parks and reserves is the business of the surveying profession.

Reducing environmental impacts includes the use of low impact urban design. Amongst other things, it involves re-engineering stormwater management through daylighting streams, holding ponds and, related wetlands and permeable paving. Neighbourhoods using these techniques are going to be in high demand in the 21<sup>st</sup> century.



**Figure 2: Talbot Park rain garden.**

A good example of the retrofitting of an existing neighbourhood is Talbot Park in Auckland (Figures 1, 2, and 3). The new design features the treatment and retention of stormwater to reduce the amount leaving the site. This is achieved through roof rainwater collection into garden tanks, road swales and rain gardens within the street, and the use of permeable paving.

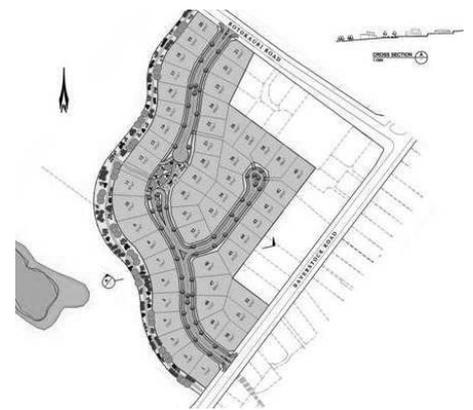


**Figure 3: Cross section of Talbot Park Street.**

Effective transport and transport choices must be embedded in the urban design of our neighbourhoods. This includes making explicit provision for walkways, cycle lanes, and public transport. Land use and transport must be considered as one, especially as the design of the initial urban fabric sets the scene for what follows.

**SMART SUBDIVISIONS**

A good example of subdivision design is Hamilton City Council’s SMART subdivision demonstration design project initiated through City-scope. The aim was to pursue a sustainable subdivision approach. Two concept plans were developed – a conventional subdivision and a SMART subdivision (Figures 4 and 5). The SMART subdivision created 63 lots compared to the 48 lots of a conventional subdivision. The SMART subdivision also had a large number of environmental benefits with a connected street layout, the creation of a range of section sizes that could accommodate a range of housing types, a connected pedestrian friendly green street network, a central green space and incorporation of Crime Prevention through Environmental Design (CPTED) principles. This gives the added benefit of long term social and environmental benefits. Houses would be able to be positioned to take best advantage of the sun and enhance



**Figure 4: Conventional subdivision.**

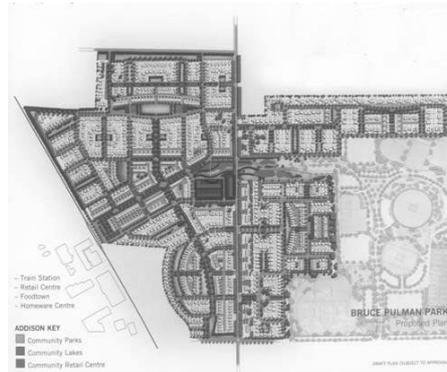
the owner’s lifestyle – the maximum solar heat gain can be achieved through facing the main living areas and rooms used the most often to face true north, or be within 20 degrees of true north. This needs to be balanced against other factors such as views and prevailing winds, privacy and how the rooms will be used. These are factors that a surveyor needs to consider when developing the design.

Another good example of a SMART subdivision is the Addison Housing Development (Figures 6 and 7), which is located just north of Papakura town centre and east of the Great South Road and the southern Auckland motorway. The Addison development was the first comprehensive medium density residential development in the Papakura district. This will be a more



**Figure 5: Smart subdivision demonstration design.**

intense neighbourhood with 20 households per hectare (conventional neighbourhoods of this area are around 10 to 12 households per hectare). A strong community has been created through the smart clustering of Addison houses around open spaces with a hierarchy of park and reserves. Children



**Figure 6: Addison housing development.**

are safe and play on the commons and reserves. Though the housing choice was deliberately limited in the initial stages the development it has provided alternatives to the surrounding traditional neighbourhoods with a higher diversity of occupants of Addison than the surrounding Takanini suburbs. Economic value is gained through houses selling on average \$80,000 more than surrounding properties selling in the local market.



**Figure 7: Addison terrace houses.**

## CONCLUSION

In conclusion, sustainability is the future of design. Surveying is a critical initiator in smart sustainable design. Sustainable design that delivers low impact solutions with a low ecological (including carbon) footprint, efficient transport network and environmentally sensitive community relevant building layouts and orientation through collaborative professional and community processes.

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# Councils taking a sustainable development approach

## WHAT IS THE LOCAL GOVERNMENT MANDATE?

The Local Government Act 2002 (LGA) sets the framework for councils' interest and mandate in sustainable development. While it is the Resource Management Act (RMA) 1991 that most surveyors are more familiar with, implementing the RMA's sustainable management objective is just one part of a council's role in sustainable development.

The purpose of the LGA is to provide for local government in New Zealand and to that end the Act:

*"...provides for local authorities to play a broad role in promoting the social, economic, environmental, and cultural well-being of their communities, taking a sustainable development approach."*

(Purpose of the LGA, section 3)

Sustainable development promotes the comprehensive consideration of all four well-beings when a council is deciding on policy, projects, activities and delivery options. The general empowerment provided by the Act enables choice on where councils and communities put their emphasis. It is not just about environmental sustainability.

## WHAT ARE COPS AND LTCCPS?

All new legislation comes with new acronyms. COP or the community outcome process is

the bottom-up identification of outcomes. It is a collaborative approach to community strategic planning where the community's aspirations for its future well-being are expressed through statements of community outcomes. By their nature, community outcome statements are at a high level. For example:

'Higher levels of employment

A safe environment for all

Transport is accessible, convenient, reliable, affordable and sustainable'

LTCCPs or long term council community plans are a ten year planning document which is reviewed every three years. All councils have a first LTCCP. The LTCCP states the community outcomes and the process to identify and monitor those outcomes. COPS and LTCCPs fit together as illustrated in Figure 1.

Most councils are starting their next LTCCP now and will start their next COP within the next two years. The current focus is on monitoring and reporting on progress towards community outcomes in preparation for developing their second LTCCP.

The LTCCP is not a plan of council activities. It is a council and community plan. A principle of a sustainable development approach is collaboration. The collaborative approach is encouraged by the LTCCP

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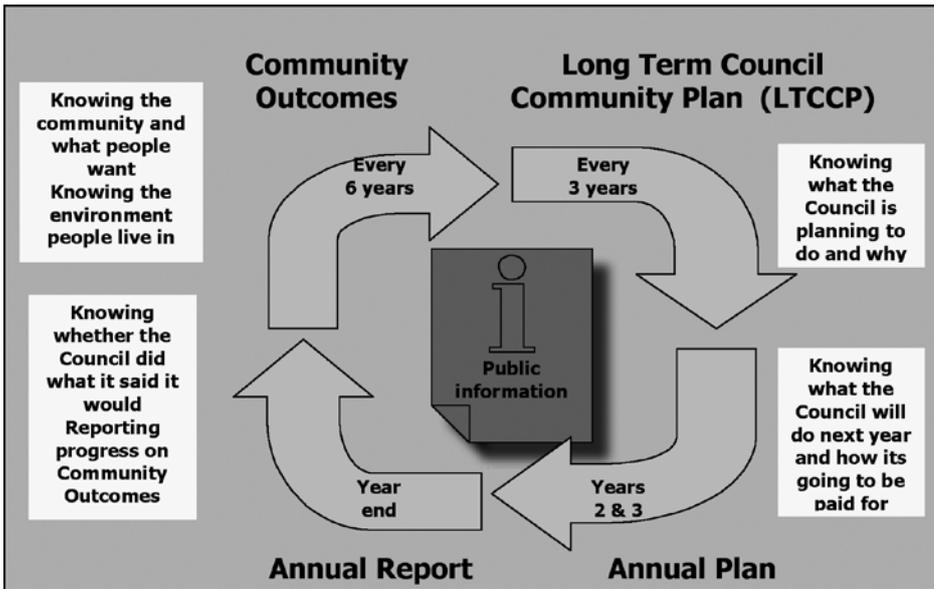


Figure 1. The planning cycle

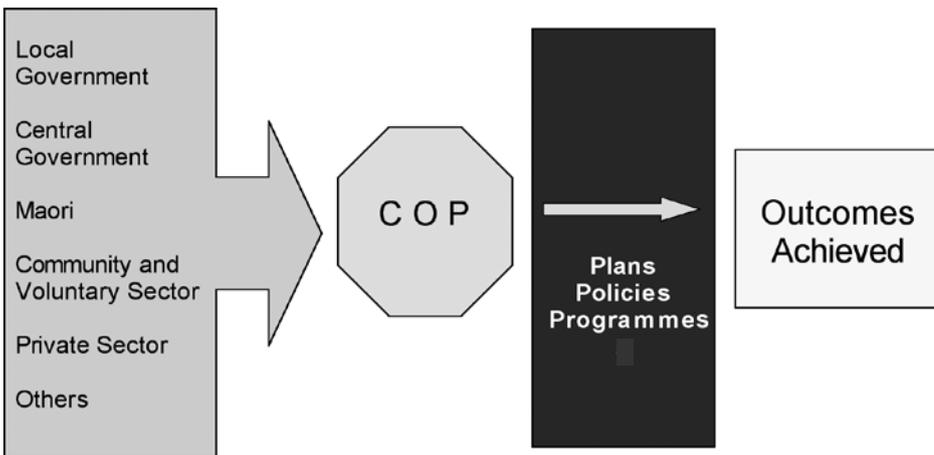


Figure 2: The planning process

process. The LTCCP includes statements on how the council will work with others to achieve community outcomes and what the council will contribute to achieving those outcomes. Achieving community outcomes involves working with other public, community and private groups and organisations in the local area. The LTCCP draws these activities together into one planning document. While the first LTCCPs have an emphasis on council activities, it is expected that over time, other groups and organisations will become more engaged in the process and see the importance and opportunities of becoming a part of this strategic community plan.

LTCCPs also state the levels of service to

be provided, the costs of providing those services, and how those services will be funded. Asset management information is part of the LTCCP, for example what assets are needed to deliver outcomes, how assets will be managed to respond to changes in demand, how additional assets will be funded, how renewals and maintenance will be undertaken and funded. The legislation has put more emphasis on levels of service and communities making conscious decisions about what level of service they want and what they are prepared to pay for their assets.

Figure 2 illustrates the overall process including the plans, policies and programmes related to a range of legislation implemented

by local government. Key documents influencing development are a product of this process.

The long term planning horizon has put a new emphasis on forecasting long term projects and spending. The 10 year framework allows councils to recognise the longer term benefits of some decisions which may cost more in the initial years. There will always remain a tension between short term drivers such as rates reviews and long term drivers such as sustainable development.

### HOW WILL THE LOCAL GOVERNMENT ACT INFLUENCE LAND DEVELOPMENT?

The local authority's role under the LGA will influence policy and standards for land development, housing, and infrastructure. It is not just RMA or other policy on environmental sustainability that will influence land development. For example, councils with an emphasis on social wellbeing may develop policy focusing on issues such as affordable housing and affordable transport. These are issues which involve all four well-beings. Any programmes to meet outcomes sought may have implications for land availability, lot size, housing density, house design, house sale price and who can buy, and requirements to connect development to public transport or local employers.

The community strategic planning required to be undertaken under the LGA sets the overarching objectives for council plans and activities including their RMA plans. The first LTCCPs prepared under the LGA were all completed by June 2006. All territorial and regional councils have identified community outcomes and developed their LTCCPs. These first plans were developed when councils already had completed or advanced RMA plans and asset management plans in place so the LTCCPs were informed by these existing policy and plans. Over time as LTCCPs are reviewed and RMA plans and asset management plans are reviewed, this direction of influence will reverse – community outcomes and LTCCPs will set the direction for the plans and activities which implement them.

**WHAT HAS CHANGED WITH A NEW SUSTAINABLE DEVELOPMENT APPROACH?**

Changes are occurring but change takes time. The planning and review cycle takes time and in particular, it will take time for plans and policies at activity and asset level to catch up. It will take time for plans and approaches to truly reflect the intent and philosophy of the LGA. Change will happen, and has happened in some areas.

A key resource or social issue may be a tipping point whereby the only acceptable solutions take the council strongly down a sustainable development route. For example a district may face a water shortage or significant pressure of fast growth where business as usual will not resolve the issue. Pressure at conflict points may also lead to change in approach, for example urban design versus engineering. A snowball effect may occur where a sustainable approach provides solutions enabling more than one issue to be addressed.

The move to a sustainable development approach may be illustrated by the comparisons in Table 1.

**HOW CAN YOU INFLUENCE COUNCIL COMMUNITY POLICY?**

The LGA sets up a framework for local government to enable local communities to lead local sustainable development. Professionals such as surveyors have a role as part of the development community in making that local community leadership happen.

**Table 1.**

<b>Focus previously on</b>	<b>Future focus on</b>
<ul style="list-style-type: none"> <li>• council</li> <li>• budgets</li> <li>• regulation</li> <li>• short-term</li> <li>• functions</li> <li>• targets</li> <li>• written word</li> <li>• in-house decisions</li> <li>• organisation</li> <li>• command / control</li> <li>• sell message to</li> </ul>	<ul style="list-style-type: none"> <li>• collaboration</li> <li>• what it enables</li> <li>• enabling / helping / investing</li> <li>• long-term</li> <li>• process / results</li> <li>• evaluation / monitoring</li> <li>• work with / engage</li> <li>• leadership</li> <li>• relationships</li> <li>• interactive</li> <li>• communicate with / listen</li> </ul>

Land owners, development groups and their professionals can talk with councils about their priorities and work programmes. You can identify your role in working with others to contribute to community outcomes in your area. The planning process is open and consultative. Any individual or group can make a submission on community outcomes, LTCCPs, asset management plans or other relevant policies and programmes.

Professionals working with a number of clients and over a number of local authorities have a perspective of the different approaches and directions to development in different areas. You can assist in enabling the collaboration, information sharing, and change in direction by sharing your experiences, knowledge and perspectives.

**IS THERE GUIDANCE AND RESOURCES TO ASSIST IN THE CHANGE OF APPROACH?**

Local Government New Zealand is preparing a sustainable development guideline for councils to promote understanding of what taking a sustainable development approach means and how to apply the approach. The guideline will provide a collection of practical examples, tools and techniques relevant to various plans, policies, and projects including asset management, activity management, and RMA and community outcomes.

Councils are at different stages of their sustainable development journey and while some councils are making first simple steps, others are taking bolder steps. No guideline can provide the answers.

A key aspect of taking a sustainable approach is about developing local solutions to local issues, involving local communities in the process. As a result there are many different approaches which have been taken by councils, reflecting the circumstances of the particular situation. Funding may also be a key determinant in the approach a council takes to a particular issue. For example, when Waitakere City Council sought more sustainable subdivision and water management solutions in response to water quality and flooding risk, the approach was to first demonstrate these types of solutions worked and were cost effective (through their own projects) and then secondly to introduce regulatory requirements to make them the preferred option. As a much smaller council, Kapiti Coast District Council couldn't fund demonstration projects but wanted to create a supportive framework for more sustainable subdivision in terms of both design and provision of services. The council initially developed design guides to promote alternative methods while continuing to allow for a more traditional engineered approach. This approach allowed for a more gradual progression of the development community towards a sustainable approach, while recognising that at that time, the community didn't support a mandatory change. Where a council does not have the support for significant change, professionals, such as surveyors, have a key leadership role in choosing or recommending between alternative approaches.

There are many existing tools, resources and programmes about sustainable development approaches. Some of these will be familiar to readers such as: ICLEI Local Agenda 21; Natural Step Framework; Communities for Climate Protection; Zero Waste; EnviroSchools; Beacon Pathway research programme; Low Impact Urban Design programme; and CABA resources. Resources and programmes focus on particular aspects of sustainable development or are targeted at particular audiences. Organisations such as Local Government New Zealand and similarly, the New Zealand Institute of Surveyors, have a role in filling the gaps

for their members and assisting in building capacity in their particular spheres of interest and influence.

### CONCLUSION

Sustainable development is not a passing phase. True integrated planning is now

mandated in the law. Not only is it enshrined in legislation however, but it is also becoming the expected practice of today. Practicing a sustainable development approach starts with small projects and examples but continues to build to a bigger philosophy and context.

Everyone who can influence social, environmental, economic and cultural well-being has a role in the sustainable development approach. Surveyors are very much in that category. Recognise and accept your role in the policies, partnerships and leadership to define the future of our communities.

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## Result of enquiry

On 19 October 2007 the Council of the New Zealand Institute of Surveyors conducted an enquiry to consider whether the actions of Mr C J Madsen of Tauranga failed to comply with the rules of the Institute as set out in Rules 19 and 20 in servicing his client.

The complaint was lodged by Mr N. Meyer of Tauranga and concerned allegations that Mr Madsen had acted unprofessionally in preparing and issuing a certificate relating to the accuracy and compliance of proposed house plans provided by Mr Madsen to his client without having undertaken any fieldwork to validate his findings.

After due consideration the Council determined that the actions of Mr Madsen in this instance resulted in –

- the local authority finding a compliance failure where it had every right to expect compliance.
- his client finding a compliance failure where it had every right to expect compliance.
- the neighbouring complainant finding a compliance failure where he had every right to expect compliance.

Council found that Mr Madsen did not make reasonable enquiry to achieve an adequate understanding of the purpose and therefore consequences for which a Surveyors Certificate was required, did not spend sufficient time certifying the plans, failed to undertake a site inspection and survey (if necessary), and did not turn his mind to the consequences of his actions. Furthermore, it found that Mr Madsen had failed by his actions to demonstrate an understanding of a duty of care as a responsible professional.

The Council therefore found that:

The actions of Mr Madsen had placed him in breach of Rule 20 of the Institute's rules relating to professional conduct in that he failed to recognise his own professional or technical limitations or inexperience and shall at all times act in a manner appropriate to the circumstances.

The Council resolved:

- (i) that in accordance with Rule 24.1.1 (d) that a fine of \$5,000 be imposed on Mr Madsen to be remitted to \$2,500 on the condition that he undertake and complete a 12-month programme of meetings (approved by Council) with a Registered Professional Surveyor mentor and through this identify actions to take in the future to address the matters which had resulted in the finding of unprofessional conduct.
- (ii) that in accordance with Rule 24.2.4 Mr Madsen be required to pay the costs incurred by Council in investigating and hearing the matter in the sum of \$3,310.
- (iii) that the decision be published in *The New Zealand Surveyor*.

## IAN ATHFIELD

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IAN ATHFIELD (Ath) is the founding Principal of Athfield Architects Ltd and has been responsible for the majority of the company's design work throughout New Zealand. In 1976 he won the International Design Competition for Housing in Manila, and in 1978 he was joint winner of a Low Cost Housing Design Competition in Fiji. He has also been a keynote speaker at international conferences, and a judge at design competitions. He was made a Companion to the New Zealand Order of Merit in 1996, and received the New Zealand Institute of Architects Gold medal in 2004. He is the first New Zealand Architect to be registered as an APEC Architect and is currently President of the New Zealand Institute of Architects. He has a strong interest in urban design.

# Survey, settlement and suburbs

## INTRODUCTION

I have been talking with the Institute of Surveyors for sometime now, and one of the big concerns has been infill housing and how subdivision actually works in New Zealand. I am concerned about how are we going to settle our planet in the future, and what it actually means to be part of the community. The strongest support of all the professions that I have talked to – landscape architects, engineers, planners, and so forth – has been from surveyors. This indicates that you all have a number of things in common – you are quite often at the end of the development chain, and you have to work at the beck and call of other people. But you obviously think the same, and it is great to have a common mind on a subject like this.

It is important as a society to look at our history and where we are coming from, and to look at where we are going. It is one of the things we don't often do as a profession of architects. We quickly forget history when

we are diving for the object, and we also don't have a very big frame for the future, so one of the things that we always have to remind ourselves is: where we came from, why things happen, and what might happen in the future.

## SETTLEMENT IN PRE-HISTORY

Figure 1 is a very early excavation of an early town. The pattern is quite different from the pattern that we see today, but if you actually look carefully at this pattern you will find there are pathways, there are spaces, and there are openings.

There are changes. There is a chance for small settlements, a chance for large settlements, and a chance for collective settlements. It is quite interesting to just look at how, when men work with each other, the sort of settlement pattern which may develop. Sometimes they develop because of a very strong community, and quite often it is because of some fortress-like situation. This is a settlement which probably developed as a community, but unfortunately was rated highly by the enemy at a certain time – it was not fortified – and we find a lot of it never survived.

## INFLUENCE OF THE OLD COUNTRY

When we come to New Zealand we find that many of our settlement patterns were

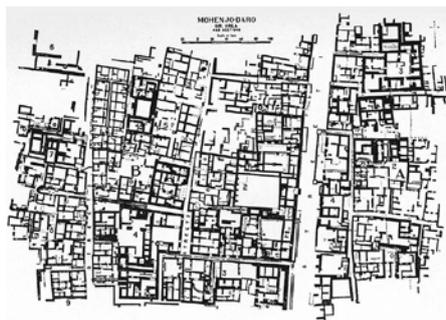
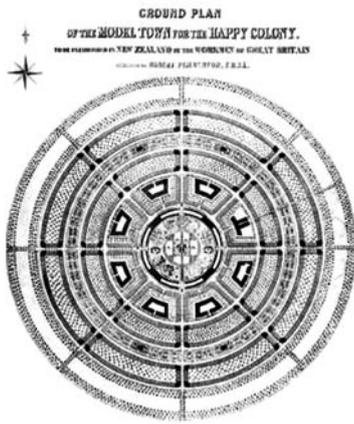


Figure 1. Mohenjodaro



**Figure 2. The Modeltown for the Happy Colony**

set out in Britain. One of the interesting things about these patterns is that most of them did not acknowledge that we actually had topography that is quite different from what they have in Britain. When the plans arrived in New Zealand the north point was generally in the wrong place. We certainly know it was from the architecture. We know that in Christchurch 60 schools were built with the north point in the wrong direction, and it was only in 1968 that, except for one which is the normal school, all were demolished, to the embarrassment of the predecessors. We discovered that they were not very pleasant to teach in and were cold in the winter. So it is surprising how slowly people change or adapt to a new situation.

The idealist in the 19th century took towns like the one shown in Figure 2, where they had the village square, the orchards, the workers, the industry, the farms and the outer periphery. These sorts of patterns are now descended – although we have a few idealist architects, now reduced to crumbs, who used to draw pictures like this, because in reality they do not necessarily work.

As a society we escaped, or thought we were escaping from, an industrial revolution, and we came to a country with plenty of land. Figure 3 shows the sort of environment that we left behind. In many ways some of that environment appears quite romantic to all of us, as indeed the painting shows, but at the time it was a fairly formidable place to be. So coming to a country like New Zealand, which had plenty of space and plenty of material, people found it quite



**Figure 3. The Industrial Revolution**

a different space. The space was the open land, and instead of closeness, separation became part of the pattern, subconsciously really, because of the space that existed. In the larger landscape, in the preferred spaces where the sun hit well, and in some mature parts of the country, settlements were very well positioned.

In the towns, for example Thames, there was still a reversion back to the pattern that was left in the old country, so we got closeness in settlement and wide streets, but certainly the vernacular of the old country. Some of the most successful housing still in New Zealand and Australia is terraced housing where privacy is absolutely important. Privacy is a thick wall between you and your neighbour, not a short distance peering in to the next bedroom window.



**Figure 5. Railway workers' houses, Wellington**

So quite often the early pioneers adjusted themselves extremely well to the sun and the site. They built simply, they created verandas where verandas were necessary, and where they were not they were lessened. From the top of the country to the bottom, the nature of the houses actually changed. Even in the workers' cottages there was a pattern which was probably appropriate for the environment. It is very interesting that many of these buildings, such as Figure 5 if you analyse the plans, are very similar to the terrace houses, except they were separated. If you have ever lived in one of these villas which is more than two rooms deep, the centre of the central room never works, so the great tendency is always to add a bit on to the back of the house, or a bit on to the front, rather than deal with the centre and



**Figure 4. Cottage and veranda, Wellington**



**Figure 6. Developed a strong vernacular, Wellington**

the neighbours. So places like the one shown in Figure 6, quite beautiful in their way, built of timber, developed a strong vernacular in the country.

The settlement pattern was about the possession of land. Once you came to this country, you had a piece of land, and so you sat your house in the centre of the land, and your privacy was measured from your boundary rather than by the neighbouring walls you shared. This pattern developed slowly during the horse and cart age. Even though that separation was something which was quite different, the pattern because of the materials used (wood being the dominant material), the scale of the streets, and in many cases the scale of the buildings, was quite appropriate and influenced how the settlements developed.

### THE EFFECT OF THE CAR

The motor car started to produce a quite different pattern for us and we were told we could go anywhere in it. Because we had this incredible freedom it was a very important change in our lives. Where the motor car was celebrated the separation distances became greater, so another pattern developed. We saw the development of tract housing, some of it reasonably attractive and some of it very appropriate for the position it was in and for the times.

The state house was the first movement to ask the people on the lowest income to find their new land on the outskirts of the city. With all this came hope, and the ability to drive your car and drink quite an amount

of alcohol when you were getting older. It really did not matter, the cars were relatively slow. People had a new freedom after the World War II and it was an excellent way of producing a new pattern in our society. So home ownership for everyone became an important part of how our society developed. People, like they do today, queued to look at the latest show home – certainly they did in my time. But unfortunately the new pattern that started to develop was not driven by housing or slowness, but by the idea that the road was the most important part of how our society developed, and so that start of the new pattern was really reinforced. For many of us, this is going back to the only pattern we really know. Living with the new pattern is quite interesting – it works much better on hilly sites than it does on flat sites.

Some of the more dysfunctional towns are the ones with wide roads. I lived in Christchurch for most of my life, and found that you actually had to bear with the neighbours. My father always used to instruct my mother to create a gap in the wall of the neighbour she got on with best. After two or three years, inevitably the gate was bolted up and we actually had a hole cut in the other neighbour's side. In such towns, closeness and community were usually related to the neighbour that you knew best, and the struggles developed amongst the neighbours you did not know so well. A pattern developed of social interactive activity in suburbs like this.

The attempts for mass housing, which were used for a number of people, certainly in Wellington and Auckland, by the Ministry of Works, were reasonably successful in the 1950s and those houses or apartments are now quite popular. The houses were generally of concrete construction, so you could not hear someone from the other side of the wall, and they provided a great place for community housing where you could resettle a city. The classic situation was where you finished up with tract housing, which has developed now both overseas and in similar cases in New Zealand. So an old pattern was broken down, and the pattern that we see now – Figure 7 – which many of you have



**Figure 7. Snakes and ladders, Flat Bush.**

to get out there and survey, is this sort of pattern. The direct road has been forgotten. It looks more like snakes and ladders than it does a sort of settlement pattern. If you get on badly with your neighbour there is only one way out of the street, you cannot escape in the other direction and it does not build a community. So we know the patterns of this type of development. The sites have got smaller, the houses have got bigger, and the gaps between them are less meaningful than they have ever been.

### THE IMPORTANCE OF SPACE

One of the most important things about architecture, or about any building, is that the space left over after you build the building is as important as the space you grab. We now know that much of the time is spent outside our houses, or moving from the inside to the outside and usable outside space is vital if we are to develop a sense of place.

One of the great teachers for me was Aldo Van Eyck, an architect who talked about the in between realm – the realm between public and private space. It is an interesting space he talked about in the early 1960s. It was the space where you hesitate before you actually go into someone's place, the space where you are greeted, the space where the door opens inwards, so you can take off your coat, the space where you are at the edge of the beach and your foot, one foot is in the water and the other one is back on sand, and you realise that you are in a very important space. The space of hesitation between private and public space.



**Figure 8. Close-spaced houses, Johnsonville**

One of the most interesting spaces which have been created in New Zealand society over the last 30 years is the space of coffee in the street. How long councils resisted the vegetable man in the street, but if you sit there having a cup of coffee, it is the least area in which you can be challenged by other people. You are there between the public and private realm, and it is one of those very important spaces which we really should think about a lot more.

I remember Aldo Van Eyck talking about being in the boat on the horizon, and all of a sudden realising that he was between the sea and sky. It is that moment of a sort of hesitation – the moment between the public and private realm – that the spaces provide, which enable people to actually be on the street, be with other people, or be alone. So that is one of the great changes which have taken place. Many of the spaces produced in our present environment do not meet the requirement – you are either in your house, or out of the house, or together with the neighbour. It is very difficult to actually expand the quality of community in these spaces. Yet as a society we are starting to learn a little bit more about them. Subconsciously, I think all of us know something about quality food, quality coffee, drinking and not driving, and we know when to feel comfortable and when we do not feel comfortable.

Another of the things about the spaces we live in. None of us are going to retire, or I hope not, in the same conditions that many migrants found themselves in towards the

end of their lives – of having to eat a roast through a straw. We are going to want good food to the last possible moment – and the right space to eat it in. The elderly want to be where they can see people and not be seen themselves, or feel they cannot be seen themselves. This sort of detail is important in the design of spaces. We need to ensure that the old lady can live right next to the street and feel part of the community. My mother when she was old, sat at the window every day behind the heavy curtains, and the light curtains, where she thought she could not be seen, and observed the next door neighbour constantly in his activities. She could report on the whole day's activities along the street.

It is important that if we are going to have a society which actually works in our community, we actually have to think about what it is going to be. We have to be strong enough to understand that good communities are built by the strengths of the weakest, not by the desires of the strongest, so the longer you leave an elderly person looking out the window, the longer you can actually cope with someone who is handicapped physically or intellectually, the longer you can leave a child in the street playing, then the better your community is. As soon as you start closing down those options you have a problem.

### **DYSFUNCTIONAL HOUSING**

A settlement by measurement of a weakness is probably a better guide to where we might be going in the future, than settlement by

the dictate of the strongest. We all know this, but what we are doing is consuming a huge amount of land, some that is not that good, but then we are not terribly choosy. I have spoken to people at the Department of Housing and Building, and the Commission for the Environment. I have said we build 500 residential units every week in this country and 400 of them will not work. I have had absolutely no reaction, so I have upped the number to 450. I think the people are now starting to get the message that the type of housing we are building now is not the type of housing that our children will necessarily want to inherit, and we are seeing signs of that around the country.

The sub-prime mortgage market issue in the United States is not about lending to the poor, it is poor decisions by people who actually do not understand the type of housing they should be involved in. Sometimes it is an investment. There is nothing wrong with that, everyone would like to live in a new house in a decent suburb.

I have been teaching a masters class for architects, and one of the students, from Nebraska, was talking about new subdivisions in Nebraska in desert situations. He was saying that people have just walked away from many of them. There are stagnant swimming pools, there are people who just cannot cope with that environment, because what you need to live there is company, you need two cars, you are a huge distance away from schools.

We are undergoing big change. We cannot rely on the statistics of quotable valuation, or the statistics of the real estate industry as a guide. It is the people who are on the ground, the people who are doing things that are important; it is your mind, the professional mind that is going to change things for the better for other people.

### **THE IMPORTANCE OF EDGES**

It is the edges of cities, the edges of towns that become the most important. The best people for occupying the edges of towns and edges of the water are farmers and fishermen. They play a custodial role, and there is no



**Figure 9. An Italian hillside village**

reason why you cannot finish up with a four or five storey town right at the edge of the countryside, where the cattle graze right up to the edge of the house. There is an historic precedent. Right around the world, for most of the world's population, this is what actually happens as shown in Figure 9. We have eroded some of the most important patterns of the past, and it is very difficult to live in our present environment, especially on a low income.

### **WHERE ARE WE GOING, WHAT SHOULD WE DO?**

We are now having our horticulture threatened, by people who find themselves in the country who do not like red shade cloth in Motueka. So there has been this huge argument, and thankfully the Environment Court turned down the argument, because this is a piece of extensive horticulture that produces 40% more apples, retains 40% more water in the soil, and produces a much better result for intensive growing. As a country we are going to be part of the food bowl of this world in the near future, so we must respect every piece of arable land.

People who are custodians of our communities quite often build poorly. Behind the Department of Conservation visitor centre at Totaranui, there was a great range of pine trees, which many people thought should be cut down because they were not native. But right in front at the beach in the middle of the view, there is a visitor centre with tokenism to Maori, and when we go around the building, there are seven isolated signs and two isolated telephone booths. It illustrates how important it is that we look at the siting of our buildings and how they



**Figure 10. Totaranui**

work. In many of our subdivisions, very little of the space between the buildings is actually used. I think one of the things I have learned is that we are poor at using land, and we really have to understand how to use land properly.

I challenge architects by saying that they do 3% to 7% of the housing stock in this country and some of it is done really badly. If they got any more, could they cope? I do not think our profession could cope. But we have a public which has a huge interest in housing. They do not have the language, but they are changing quickly and we have to be aware of that. So this pattern cannot continue and must cease, because it is building redundant stock, and is asking the people on the lowest income to be the pioneers, is mortgaging them for life and the buildings become no use to anyone.

We are enticed by the real estate agent to look at apartments, so we have been sold dummies of apartments as well as dummies of raw land. I do not think the apartment market is as poor as one is told. We are looking at a classic situation at present in Hobson Street and Nelson Street in Auckland City. Housing sold at \$7,500 per square metre some three or four years ago is now reselling for \$3,500 a square metre. It probably may soon be \$2,000 a square metre, which actually means for the first time in private enterprise, housing is built for the poor in the right place in this country. Once it gets there, our job will be turn Nelson and Hobson Street back into two way streets with trees in the middle, and all of a sudden you have got population in the right place where they can walk to the universities, where they can work in the town, and coupled with



**Figure 11. This pattern must cease**

that we are looking at car parking buildings which can be converted into something else in the future.

The buildings can be used for storage, servicing, or getting industry back into towns, because we actually have to look at future proofing the society we are in. In the past there were big differences between the towns and countryside, and it is the traditional patterns that we should be emulating: the strong edge, the great countryside, and by doing that, both settlements and countryside are respected.

If you look at the pattern of historical cities there was nothing really wrong with them, and they did not actually cater for the motor car. In many ways, we have to get back to some of those patterns. The motor car will exist, we cannot deny that, but we need to have an educational process for getting rid of the car when we do not really need it. We know that if you provide 0.5 to 0.6 car parks for every apartment in Wellington you will sell the last apartment with the sale of the last car space. In Auckland it is 1.8 to 2.2 and Christchurch is 2.5 to 3.0. Christchurch because of the layout of the city, they have a car for Mum and Dad because they want to live out of town. There is a car for each teenager so that when he gets drunk he can leave it in town and sleep in the flat, so it is quite different.

If you plan to deny the use of the motor car, you do not get decent settlement patterns, but what you actually have to decide is how you are going to use the space designed for cars for different uses. At Lambton Harbour in Wellington, Shed 21 has temporary spaces for cars because there is no way you

are going to get retail space on the ground floor, but that is how the city built up. The temporary space will be used and is safeguarded for retail or some other use and that is absolutely important tenure we give to people. The strata type of buildings are going to be a nightmare for us in the future. We are looking at one in Willis Street at present and it is just so difficult to turn around after 30 or more years, no one will benefit.

The pattern of historical settlement shown by Figure 9 is so strong. It still has those private spaces and it still gets the sunlight in the right windows. Yet we are building housing at present which actually faces south, which is on the wrong site such as horticultural land. It is the space between the buildings which is more important than the space we created. It does not have to be in wood, it can be in modern materials, but

these demonstrate that we do owe ourselves to protect the countryside.

The pattern of the countryside has been changed by horticulture. We are talking now with the Department of Conservation about a policy for urban design, and we are saying that urban design should apply to roads and to landscape, because in many places the planting of trees should not follow best with boundaries, but should follow the pattern which is created by the landscape around it.

We need to protect our edges, but what do edges mean? It is not walking right around the edges of this country, its being able to come to them, go down to the water and come out. So I suggest that the foreshore and seabed is about section, not about plan, and this cannot be tainted with buildings.

It is important to have healthy cities and we are getting them. It is going to happen much more quickly than anyone has actually thought. Just look again where I started (Figure 1). The etching of a pattern on the landscape becomes important for communities of the future, as important as it was for the past, and I think we have a huge responsibility to actually make it work.

#### ACKNOWLEDGEMENTS

This paper is a typescript of Ian Athfield's talk, repeated to the Wellington Branch of the New Zealand Institute of Surveyors in December 2007. Figures and photographs were provided by Athfield Architects Ltd, Wellington. While every attempt has been made to contact copyright holders to the figures in this paper, we would be pleased to hear from any copyright holders who we have been unable to contact.

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# Collaborative approaches to sustainable development Lessons from the Nordic countries

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## ABSTRACT

Three Nordic countries – Finland, Sweden and Denmark – are noteworthy for simultaneously achieving good economic and environmental performance. The environmental values held by residents of these countries are similar to those held by New Zealanders, but the Nordic countries are better than New Zealand at translating the values they hold into effective environmental policies. A comparative study of sustainable development policy-making processes in the Nordic countries and New Zealand has highlighted the important role played by collaborative practices in achieving those outcomes. Nordic collaborative governance practices are described, along with important contextual elements and key success factors for this approach. The question of whether a collaborative approach could be learned and replicated in New Zealand is discussed. Sweden's consensually-based national environmental objectives illustrate the approach. It is suggested that New Zealand's environmental management system would gain from having similar national objectives, and that wider application of collaborative governance in New Zealand would be desirable.

## INTRODUCTION

For those of us convinced of the need for sustainable development of our societies, the burning question is – how to do it? We in Ecologic have searched widely for encouraging models, and in doing so, have found it important to move beyond the comfort zone of the English-speaking countries that we usually model ourselves on.

That is because most of the English-speaking countries have had a disappointing performance in sustainable development. Take the single but perhaps most important example: the area of climate change policy. The United States and Australia (until late 2007) have refused to join the Kyoto Protocol; the Canadians joined it but now

say they will not meet its obligations; and New Zealand has joined the Protocol but has until very recently been unable to agree on how to implement it, with the result that its emissions have rocketed up to 25 percent above the 1990 baseline level established in the Protocol.

Only Britain has a reasonable chance of meeting its stated emissions target, and even then, it owes more to the fortuitous development of gas fields to replace coal, than to any concerted national policy effort. The common theme in the English-speaking countries, other than Britain, is of two decades of quarrelsome arguments culminating in very limited action on climate change.

GUY SALMON is executive director of the Ecologic Foundation, a think tank on sustainable development. In this article he presents preliminary findings from comparative studies of sustainable development in the Nordic countries, carried out with research collaborators at the University of Helsinki, and supported by a grant from the Foundation for Research Science and Technology (FRST).

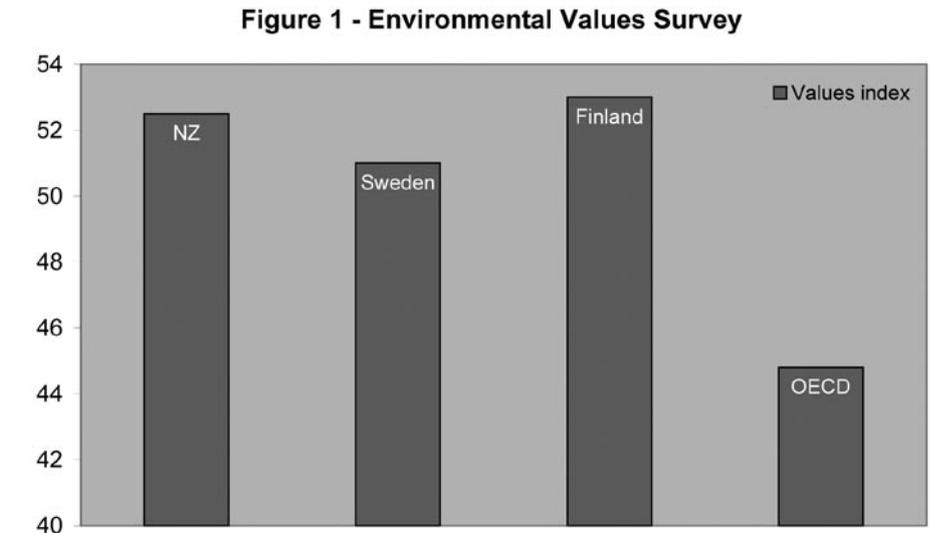
Countries with more collaborative governance institutions have done rather better at responding to the challenge of climate change, and rather better at moving toward sustainable development generally. Particularly impressive in this regard are the Nordic countries, whose institutions and experience are the subject of the current Ecologic research project.

### LEARNING FROM THE NORDIC COUNTRIES

The project is a comparative study, and the point of reference throughout is New Zealand. Nonetheless, our findings should be of interest to Australians and possibly to other countries in our region. We have focused on just three Nordic countries: Finland, Sweden and Denmark. Excluded here is Iceland which is small, and Norway, which is so rich that it does not face the same difficult trade-offs that ordinary countries like ours do.

Finland, Sweden and Denmark are in many ways more comparable to New Zealand than the English-speaking countries that we usually tend to compare ourselves with: Australia, the United States and Britain (Salmon and Zilliacus 2007a). The three Nordic countries are similar to New Zealand in population size and GDP per capita, and in their political systems, which are based on proportional representation with multiple parties and coalition or minority governments, and which are non-federal systems with strong traditions of local government (including powers to raise income taxes in some Nordic countries). These countries are also similar to New Zealand in having been through recent episodes of economic reform and adjustment, and in having open, export-oriented economies with quite large primary production sectors, and quite similar environmental issues.

The three Nordic countries currently have centre-right governments. Sweden has a history dominated by governments of the left, while the other two countries have alternated between left and right in a pattern not dissimilar to New Zealand. The Nordic countries differ somewhat from



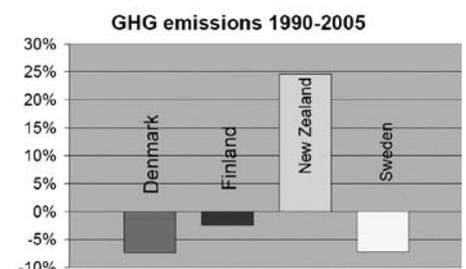
**Figure 1. Environmental Values Survey Results (Salmon and Zilliacus 2007a).**

New Zealand (and from some of the EU's larger economies) in their recent economic dynamism and in their wider reliance on markets and property rights. For example, the Nordic countries were early adopters of electricity markets, a model which many other countries including New Zealand have since followed. While there are some variations among the countries, in the Nordic world there is commonly predominantly private ownership of the foreshore and seabed, water areas, forests, fisheries and game animals (Salmon et al 2005).

### VALUES TRANSLATED INTO ACTION

Analysis of international survey data on values shows that the peoples of New Zealand and the Nordic countries have very similar values on the environment – values that are notably greener than the OECD average (Figure 1). Our research suggests that – at least in our case study areas involving responses to climate change, protecting biodiversity on private land, and managing agriculture's impacts on water quality – the difference between us and the Nordics is that they are more successful than we are at translating their values into effective environmental policy performance.

Figure 2 depicts changes in greenhouse gas emissions since the Kyoto baseline year of 1990, in New Zealand and the three Nordic countries, all of whom have been successful



**Figure 2. Percentage change in greenhouse gas emissions of three Nordic countries and New Zealand, 1990-2005.**

in reducing their emissions below 1990 levels. A key factor in this was their early ability to reach agreement around placing a price on carbon emissions, which occurred in Finland in 1990, Sweden in 1991 and Denmark in 1992. A decade and a half later, it has still not happened in New Zealand, although it appears it is finally about to happen.

Some other striking examples of effective implementation of sustainable development policies in the Nordic countries include:

- Denmark's successful, 20-year action programme to reverse the serious degradation which had occurred in the quality of the water in its lakes, streams and rivers;
- The well-funded and often innovative approaches to protection of biodiversity on private land used in each of the Nordic countries;

- The introduction, after a trial period and a referendum, of a road pricing system to address traffic congestion in Stockholm.

What explains the impressive ability of Nordic societies to translate their environmental values into timely policy action? The full story is a complex one, and not without its ambiguities, but our analysis suggests that the key feature which distinguishes their experience from ours is the development and institutionalisation of collaborative and consensual decision-making practices in the Nordic countries.

### **POLICY MAKING BY COLLABORATIVE GOVERNANCE**

The Nordic collaborative approach is not unique to environmental policy but extends widely across policy-making processes, as a means of building both multi-party parliamentary majorities, and a sense of policy ownership amongst those agencies and groups whose co-operation is important for policy implementation. In addition, achieving a broad cross-party consensus is strongly emphasised in policy areas with long term implications such as foreign policy, environment and pensions policy.

In all cases in Sweden, and in most cases in the other Nordic countries, legislation and major policy initiatives are preceded by multi-stakeholder deliberations (Salmon and Zilliacus 2007b). On environmental issues, deliberating groups usually include environmental and business representatives alongside officials, experts and often politicians. When politicians are involved, all parties in the parliament are invited to send representatives. The groups are focused on a defined issue, and aim to devise a policy solution to that issue. They involve the participants in deep immersion, for prolonged periods of time (usually a year or more), in technical information and policy analysis. The deliberating group is furnished with a secretariat with expert policy staff and commonly, a budget for commissioning relevant independent research as well.

The aim is to achieve a consensus, or where that is not possible, then as broad

an agreement as possible, with dissenting participants recording their reservations. The drive for consensus elicits from interest group representatives a pattern of behaviour that is relatively unfamiliar in New Zealand. On the one hand, they are in a powerful position to shape policy. On the other hand, their ongoing influence depends on their maintaining good relations with other participants, whose agreement must be obtained for anything to progress. The result is that powerful incentives are operating for the sensible integration of environmental, economic and social policy.

While the term 'consultation' is often used for this process, it commonly places its participants in the role of negotiating consensual policy solutions which by convention are closely followed by the final decision-makers, either governments or parliaments. This means that the system can best be characterised as 'collaborative governance' rather than as 'consultation'.

The collaborative governance approach to policy-making has a number of important advantages, including:

- It tends to overcome impasse, and to speed up the process of adopting effective policy measures for sustainable development;
- It creates policy solutions which are durable through changes of government;
- It creates a supportive climate for implementation, and can reduce litigation, and the associated uncertainty, delay and cost for investors;
- It facilitates agreed interpretations of science, risk and uncertainty;
- It increases the influence of science, reasoned argument and what one of our interviewees called "intellectually good solutions" in policymaking.

### **SUCCESS FACTORS FOR COLLABORATIVE GOVERNANCE**

Our interviews sought to understand why the diverse participants tended to reach an agreed outcome in these collaborative

processes. Three factors seemed to be particularly important:

- They make a compromise because there is a political convention that if they achieve a consensus, it will be implemented. This gives participants the incentive, and the confidence, to exchange concessions.
- They have to make compromises in order to stay in the game long term. Those interest groups that persistently fail to do so, will find themselves on the outer, with only indirect influence.
- The participants want to have both sides of politics bound in, to achieve durable solutions and policy stability.

These three key points distinguish the practice of collaborative governance from traditional governance. In our case studies, we identified several additional contextual factors that seemed to pre-dispose toward successful collaborative outcomes:

- Leadership throughout the governance system is focused on achieving wide ownership of policy problems and solutions across political parties, across government agencies, and across major stake-holding groups. There is an emphasis by stakeholder group leaders on understanding and accommodating the objectives of others.
- In the deliberative process, there is a commitment to getting all the participants deeply immersed in information about the policy problem, in a non-adversarial, roundtable setting in which real learning can occur. The participants in such processes often seem in the end to have a rather better understanding of the policy context and rationale than does a typical New Zealand Ministerial decision-maker. This roundtable setting also enables experts to reach agreement on the treatment of scientific and policy-relevant information, uncertainties and appropriate assumptions, rather than being cast into an adversarial setting on these matters.

- The collaborative governance system works best where there is a strong interdependence of the negotiating parties, based on a rough equality of power such that each can block others from achieving their objectives. In some cases the equality of the parties is bolstered by politicians making clear behind the scenes the importance of making concessions to groups whose buy-in they are keen to have.
- The negotiating parties are accountable to sectors which are themselves reasonably cohesive. Nordic governance systems draw on large membership organisations including business organisations, trade unions, interest and professional groups and community organisations. In developing national environmental policy and legislation, large, moderate environmental NGOs with many local branches and internal election processes are cornerstones of the governance system. An example is the Danish Society for Nature Conservation, whose membership of 270,000 is many times larger than its New Zealand equivalent, Forest and Bird, even though Denmark's population of 5.4 million is only slightly larger than New Zealand's 4.2 million.
- There are strong negotiating conventions governing the behaviour of participants, who risk losing their continuing access and influence if they take positions widely regarded as 'unreasonable' or walk out of the process. But there are also pressure-valve mechanisms. For example, in difficult negotiations on forestry matters in Finland, the Finnish Society for Nature Conservation formed part of the consensus outcome but allowed its youth branch to issue a critical statement, as a subtle but acceptable way of expressing its frustration that it could not win a stronger result.
- Policy development commonly resolves conflict by getting agreement on very long term outcomes, and then setting a series of interim milestones which reflect a rate of change that is agreed to

be realistic and manageable; attention is paid to getting clarity and precision in the definition of milestones, together with agreed procedures for monitoring and review.

- The system both relies upon, and helps to build, a widely shared sense of the importance of working together for the national interest, with the latter seen as embodying economic, environmental and social dimensions. Participants are concerned with 'what is the right thing for Finland,' and not just with promoting their sectional interests.

### CAN A COLLABORATIVE STYLE BE LEARNED AND REPLICATED?

It is easy to make the assumption that the Nordic commitment to consensus is simply part of their cultures, something that could not be replicated in a more fractious, Anglo-Saxon context. However, social scientists are reluctant to revert to broad cultural explanations, given the extraordinary diversity that is present within any modern culture.

Collaborative leadership styles appear to grow from experience with proportional electoral systems and minority governments, of which all the Nordic countries have long experience. While New Zealand's experience of these dates only from 1996, political leaders who learned their skills under the new system are now starting to emerge.

An important point about Nordic institutions of collaborative governance is that they have grown over the years through conscious design and consistent leadership (Salmon and Zilliacus 2007b). This is particularly evident in the case of Finland, which had a civil war in 1918 in which the victors imprisoned 74,000 of their fellow countrymen. For the next two decades, Finland was in many respects a bitterly divided society, a division that still had a politically mobilising effect until the 1970s. In the post-war period, the need to secure Finnish independence in relation to the neighbouring Soviet Union led to a strong consensus tradition in foreign policy. Since the mid-60s, the consensual

approach has gradually become recognised as valuable, do-able and successful, and it has spread to other areas of policymaking. Today, Finland appears even more consensual than Sweden (Arter, 1999).

It is then, from some painful past experiences that Finland gradually developed the consensual approaches that are now well-established and appear to be part of their culture. The Finnish experience suggests that collaborative decision-making involves a set of values and skills that gradually can be learned and integrated into a national political culture, however conflictual its point of departure may be (Salmon and Zilliacus 2007b).

### SWEDEN'S NATIONAL ENVIRONMENTAL OBJECTIVES

All the Nordic countries use agreed environmental objectives to drive forward change. Sweden is unique in having established a comprehensive set of national environmental objectives, negotiated in a collaborative process and unanimously supported by its parliament (Salmon 2007). The parliament's aim was to hand on to the next generation a society in which the major environmental problems of Sweden have been solved.

The Swedish legislation sets out 16 broad national goals to be achieved over a 20-year period from 2000, supported by 71 more detailed, interim milestones to be achieved over shorter timeframes. The law assigns responsibility for each to particular authorities, and establishes an Environmental Objectives Council which must monitor their performance and report annually to parliament, with a major review every four years. Climate change objectives are excluded from this system because of their dependence on other countries' commitments and actions.

The system was developed on a consensual basis by a committee comprising the full spectrum of six political parties, relevant government agencies, and major stakeholders including the Swedish Nature Federation and the major business organisation. No

reservations were entered by any of the participants. While the objectives are not directly legally enforceable, their consensual basis has assisted greatly in eliciting the resources and co-operation needed for their implementation. All regional councils and most local authorities have now developed plans and programmes for implementing the objectives in their own work.

The effectiveness of the environmental objectives system depends a good deal on the extent to which they can be translated into quantified or at least specific, measurable detail. The Zero Eutrophication objective, for example, is further defined with 10 indicators, and there are four milestones to be achieved by the year 2010. The milestones are as follows, with summaries shown for each in italics, of the latest assessments of progress made by the Swedish Environmental Objectives Council (2007):

- Waterborne phosphorus to be down 20% on 1995 levels – *possible to achieve provided further action is taken*
- Waterborne nitrogen to be down 30% on 1995 levels – *expected to be met*
- Ammonia emissions down 15% on 1995 levels – *achieved five years ahead of schedule*
- Emissions of nitrogen oxides to be down to 148,000 tonnes – *further action must be taken to achieve this.*

The other Nordic countries have set their objectives on a sectoral basis, such as the Danish action plans for water, which required quantified reductions in releases of nitrogen and phosphorus compounds over specified time periods, and successfully delivered these. Institutional arrangements for leadership also vary, with a striking example in Finland being the prominent role played by the National Commission

on Sustainable Development, chaired by the Prime Minister. Besides the strong focus on leadership at the national level, a defining character of the Nordic approach to objective-setting and accountability is that it is results-based. A great variety of policy instruments and programmes are used in a pragmatic way, with the focus being on achieving tangible results for the environment itself.

This contrasts with the approach in New Zealand, where the national policy level is still largely a vacuum, and where regional councils set vague and usually undated objectives, and are oriented around activities (mainly planning and consenting) rather than achieving particular environmental conditions in particular time frames. The New Zealand environmental management system would gain a great deal from the negotiation of a system of national objectives similar to that adopted in Sweden.

### CONCLUSION

The keynotes of the Nordic systems of environmental governance are vision, cohesion, and a results-oriented pragmatism. Leadership is based on national goals, developed in a cohesive way, and supported by major, well-funded national environmental programmes. An emphasis on cohesive ways of doing things, and a focus on the long term collective interest of the country in which economic, social and environmental goals must be integrated, flows down through the Nordic systems. The result overall is fewer arguments, lower process costs, and better results – from both environmental and economic perspectives. It would be misleading to suggest there are no problems with Nordic environmental management systems; but in the prevailing climate of cohesive and respectful relationships, it is easier to fix such problems as they emerge,

although it does take time.

There are surely lessons here for New Zealand. Cohesive institutions would enable us to move beyond impasse, and to deliver on achieving the things we value. For small countries, this is a potential source of competitive advantage. But it requires conscious institutional design, and it requires the right sort of leadership – not only in government agencies and politics, but in stake-holding sectors, from Forest and Bird to Federated Farmers. New patterns of behaviour must be modelled and demanded. The Nordic countries present a model that has been developed over time in small countries similar to ours, and which enables the Nordics to deliver on their clean, green values while growing their prosperity. Can we afford to ignore their example?

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