

Rural Community Resilience and Climate Change

**Report to the Ministry of Agriculture and Forestry,
New Zealand**

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Executive Summary

This Ministry of Agriculture and Forestry (MAF) commissioned study on Rural Community Resilience and Climate Change uses information from case studies and focus groups to examine:

- sector and individual views on climate change
- case study communities' awareness of climate change
- perspectives on resilience (key aspects of resilience important to New Zealand's rural communities)
- characteristics of resilient rural communities, and barriers to resilience
- measures to maintain and enhance rural community resilience in the face of climate change, including actions already being taken to adapt to climate change, examples of community initiatives to maintain and enhance resilience, and measures which could be taken in future to enhance resilience.

Climate change

The fourth IPCC report unequivocally demonstrates that New Zealand is already experiencing the impacts of recent climate change (Hennessy *et al* 2007:509) with, in particular, increasing stresses on water supply and agriculture. Adverse events are expected to occur more frequently and more intensely as climate change accelerates. Key trends are:

- increased drought risk in the east coast – more frequent and prolonged droughts
- very heavy rainfall events when rain occurs ('weather bombs')
- higher temperatures and an increased risk of very high temperatures
- increased risk of forest fire
- rising sea-levels
- fewer frosts
- loss of biodiversity
- increased risk of new pests and weeds.

CASE STUDIES

Interviews were held with a range of national level representatives, leaders of rural organisations and industry sectors, and regional and central government, to develop an overall picture of national sector views on climate change and rural community resilience. Discussions on resilience issues were held with case study communities in Central Hawkes Bay and North Canterbury through a combination of focus groups and one-to-one interviews

Perspectives on climate change and resilience

There are a range of views about climate change in rural communities. Critically there is a disparity between the seriousness with which central government, many local authorities and industry organisations are treating climate change and an overall picture of vagueness about the issue by individuals. Because the community is used to coping through adverse events and has a stoical attitude of "*just dealing with it*" taking action to mitigate climate change is not yet a priority for most people. On the other hand, clear unambiguous messages and information about (long term) measures that can be taken to adapt to climate change may assist people to prepare. Experience of droughts and earthquakes mean that there is good

understanding that 'events' have long lasting impacts, and advance preparations for inevitable developments are worthwhile.

Award winning farmers recognise the need to plan many years in advance to achieve environmentally, economically and socially sustainable businesses/properties. The various competitions provide recognition of, and publicity about, their efforts. For them and other members of rural communities, once economic viability is assured, the focus is on social issues as the basis for their and their communities' resilience.

People in the case study communities expressed a strong belief in their own resilience and in their community's resilience. They had pride in this and were keen to further build community resilience.

Characteristics of resilient rural communities

In addition to concepts like 'enduring', 'adapting', 'bouncing back after crisis', people in the study areas described resilience as "*being open to change and diversity*", "*toughing it out*", "*pulling together as a community*", and "*having a sense of belonging...participating in community affairs*".

For a community to be resilient requires it and its people to have a strong and viable (and preferably diversified) economic base, Beyond this, greatest emphasis was placed on social elements and values such as social connection. The study communities had experienced profound changes over the past 30 years, and on-going improvements in roading and communications technologies are reducing isolation and bringing further change.

Changes in the economic base (in farming and other businesses) which have increased time pressures and reduced people's availability for voluntary and community work and social activity, together with demographic changes (particularly the hollowing out of 20-34 year olds in rural communities) create new challenges for maintaining the service infrastructure and social networking. Feedback identified a common belief that the more individuals and families are actively involved in community affairs and projects, and the more people network and undertake activities together, the stronger the resilience of the community. The study areas all had a range of amenities and some key services that were the result of community fundraising and political agitation spearheaded by locals.

Similarly there was a desire that when change is introduced from outside, or when institutions (such as central or local government) require new approaches or behavioural change, the way it is introduced is through consensus decision-making involving the full range of stakeholders. Even if formal planning is not taking place, if groups of people with diverse views are coming together informally, there are greater opportunities for people to be aware of different viewpoints and to see issues that are not necessarily on their own radar as important. Even if not agreeing with others, people feel empowered. The opportunity to understand where others are coming from can ease tensions and build stronger more resilient communities.

Where the principle of caring for others was actioned, people felt that there was 'strong social capital' and their community was more resilient as a consequence. Caveats to this perspective include the degree to which people are now commuting between rural and urban areas giving them less time and less attachment to place, and the propensity for people to predominately network within their own social circles. Local leadership which recognises the need to act, and which brings different groups together, can overcome this. Numerous examples were given of community action such as 'drought buster BBQs' and school

working bees which cut across social distinctions so that “*it doesn’t matter how long you’ve been in the community, it’s what you contribute that counts*”.

Effective local leadership is critical for resilience as such people are seen as empathetic and ‘walking the talk’, so are trusted. While people do not like being told what to by outsiders (particularly bureaucrats with limited knowledge of the district and how things are done), they are very willing to listen to ‘experts’ who have personal experience in the issue at hand.

Measures to maintain and enhance rural community resilience

Even though planning for climate change *per se* is currently not a key priority for most rural people, many of the activities they engage in will contribute to building and maintaining the resilience of their communities. Experience of coming together as a community enables people to respond more effectively to shocks and adversity as well as assisting them see the value of group action to implement change.

Local initiatives led by groups such as the Oxford Community Trust or Te Taiwhenua ō Tamatea encourage and contribute to familiarising people with the exercise of holistic and integrated approaches to issues. Such initiatives can prompt often completely new ways of dealing with challenges. They also lay the foundations for tapping into groups that are not always listened to across the whole community (for example, young people, tangata whenua, ethnic minorities). Involvement by the whole community in community-building activities also helps build a sense of community identity and pride.

Formal structures which adopt an investigative rather than adversarial approach support more holistic and integrated approaches to exploring and resolving issues.

People noted the value of information about long term planning for slowly evolving change, as well as advice on managing through an adverse event (and advice on coping with disasters when away from home or usual workplace). In this context, the value of access to technologies that are not reliant on electricity was noted.

Given the importance of social connectedness and community-led decision making, it may be of benefit for institutions and government to provide access to training to enable project leaders to build facilitation skills for leading cross-group meetings (particularly for large community consultations).

1. INTRODUCTION AND KEY FINDINGS

New Zealand agriculture and forestry is facing a changing climate including warmer temperatures, increased droughts and more intensive, frequent and damaging rainfall events across the country. The conditions for farming and growing are changing. Adapting to a changing climate is becoming a priority for rural communities in New Zealand.

The Ministry of Agriculture and Forestry (MAF) commissioned this research as part of its programme to assist rural New Zealand prepare for and respond to the impacts of climate change. MAF's goal is to work towards "*agriculture, food, forestry and related sectors [that] are adaptive to the challenges and opportunities associated with the global focus on climate change*" (MAF 2010a). It notes that to achieve this outcome requires, among other things, 'connected and resilient rural communities'. MAF recognises that climate change could result in more stress within communities and that the more resilient a community is, the more likely that a community will be able to cope with stress and adapt to climate change.

For this research MAF required the following:

- a review of existing research and information on rural community resilience
- a desktop statistical review of the situation and outlook of rural communities in New Zealand, including an in-depth analysis of two rural communities that will be the location of case studies on rural community resilience
- organisation and sector views on climate change (using the downscaled IPCC Fourth Assessment Report (IPCC 2007) as a basis)
- individual interviews and focus groups in case study communities to assess current levels of resilience, actions being taken to build resilience and their effectiveness, and actions that could be taken to improve resilience
- development of solutions and methods that can be used to maintain or enhance resilience based on the information from the case studies, and including analysis of how mainstream community, social, economic and cultural processes influence rural community resilience.

STRUCTURE OF THE REPORT

The first part of the analysis is a short review of existing research and information on rural community resilience. The second part provides information on rural community resilience from interviews with key personnel from various national and regional organisations associated with New Zealand's rural economy and society, and from individual interviews and focus groups undertaken with people from rural communities in Central Hawkes Bay and North Canterbury.

The study finishes with conclusions (and some recommendations for MAF) based on the interviews and meetings¹ about rural New Zealand communities' preparedness for climate change, how they are (or are not) dealing with the current impacts of climate change, and

¹ Six focus group meetings (including two with senior secondary pupils) and around 50 interviews were held between late April and mid-June 2011. Two-thirds of the interviews were with residents from the case study communities, the remaining third with organisational and industry sector representatives.

what preparations are (or are not) being made and could be made to deal with climate change impacts in future.

Background material that informed the analysis is found in Volume 2 of this report. It includes a desktop statistical review of New Zealand's rural communities (1981 to 2006), a review of literature on the changes in New Zealand's rural communities since the 1980s, and information on the case study communities. It also contains a short review of international literature on community resilience.

KEY FINDINGS

Views on climate change

Sector views

The sheep/beef, dairy and forestry industries and their service industries are strongly focused on the 'environmental footprint' of their sector. The official view is that climate change is topical and that funding research on reducing emissions is a worthwhile investment.

The Meat Industry Association has been funding research to monitor the greenhouse gas footprint of exported lamb and other red meats. Fonterra spends around 10% of its milk solids levy on climate change related research. Its 'clean streams' communication programme (started in 2002) initially met with outrage. Now every dairy farmer supplying to Fonterra has to justify their efforts "on key metrics", and those who are non-compliant in their effluent management are expected to put Effluent Improvement Plans in place. Farmers "*are now thinking about effluent from the perspective of the overall nutrient balance on their property*" (Parsons 2011), and Fonterra is scrutinising its suppliers' nutrient use more closely.

Forestry (and local government entities) support tree planting as an opportunity to sequester carbon, as well as for biodiversity, erosion control and water quality improvements. The forestry industry sees this as improving the physical resilience of communities to the future impacts of climate change. Forestry companies such as Oji Paper (which owns Pan Pac Forests Products Ltd – the company with cutting rights in Central Hawkes Bay's Gwavas forest) have Forest Stewardship Council Certification for its forest management, sawmill and pulpmill.

The Farm Forestry Association's view is that planting trees for carbon credits on parts of the farm where the property is susceptible to erosion will assist in building the social resilience of rural communities by farmers:

- taking remedial action before slip damage becomes irreparable
- experiencing a psychological boost through the feeling of doing something worthwhile with a positive outcome
- improving the look of their properties
- building-up the resilience of properties to adverse events and future impacts of climate change.

To support and encourage more planting many farm-foresters and farmers would like to see carbon credit recognition given to trees planted along fence-lines, waterways, gullies, and to mitigate soil erosion. Nevertheless there is still a strong anti-forestry attitude among farmers

who see the erosion of community and a loss of services (especially local school closures) when whole farms are converted into forest.

The Resource Management Act section 7 requires local authorities to take account of the effects of climate change when carrying out their functions. Local body staff tend to be aware of the issues and some are very well informed about climate change. Technical staff, for example, are reviewing climate change issues, particularly in coastal areas where sea-level rise is recognised as a problem.

There is a range of attitudes among elected representatives in the study communities. With the exception of Waimakariri District Council which has asked for a Climate Change Policy, councillors are less concerned about the institutional and social responses councils could take to support community adaptation to climate change and more concerned with checking the adequacy of physical infrastructure, such as stormwater systems.

A key issue for councils across New Zealand is the adequacy of their financial resources to implement national level policies, particularly if these are not local priorities identified through community plan consultation processes. Some councils cover very large geographic areas but have small populations and a low rating base. Smaller councils are unable to provide the range of services larger councils provide. Community resilience in these circumstances may be curbed by a lack of resources and capacity.

The regional councils are taking climate change very seriously. Hawke's Bay has an integrated approach that includes social, economic and environmental outcomes. Water harvesting and storage is a priority, and forestry and clean energy are part of its strategic planning.

Canterbury's collaborative integrated approach to water management is a radical departure from previous adversarial methods. Spanning the next 30 years, the strategy covers issues as diverse as ecosystem health, kaitiakitanga², the natural character of braided rivers, drinking water, recreational use, irrigation, efficiency of water use, energy security, regional and national economies, and environmental limits.

Individual views

Many members of rural communities do not have a great understanding of what future climate changes will be (particularly given the long lead-in time) or how change will impact on their business. *"People don't understand that a 2^o Celsius increase in temperature is not benign, it's a huge change"*.

Farmers recognise that climate change will introduce significant land use changes that will have social and generational impacts likely to dramatically change farming communities. The changes of the last 25 years have already brought major change and there is an expectation that such change will continue. How this is dealt with is a different story, but there is recognition that the greater diversity among newcomers to rural communities will require a tolerance, and making use of, different ways of thinking and doing. This will be critical for continuing to build social capital and resilience.

² The active protection and responsibility for natural and physical resources by tangata whenua (see Appendix A for glossary).

The volatility of weather patterns means that farmers take making adaptations for drought conditions as a given ('weather bombs' are an expected annual event). Farming conservatively, e.g. reducing stock (fewer ewes), enables the focus to go on producing quality and bigger lambs. There is widespread concern about access to water as this is one of the biggest constraints on farming. At the same time there is a level of complacency among some farmers who appear unaware of the need to make changes to their management style:

They don't have sufficient shade on their property to protect stock, they are losing soil to the neighbouring farm, but they can't see the need to do anything differently. [and] Farmers have to see what other farmers are doing successfully to recognise there is a need to change their own farm practices.

When climate change was couched in terms of hazard management there was considerable interest. Hazard management links with infrastructure maintenance – a concern for both rural people and local authorities.

There was concern that the Emissions Trading Scheme is shifting finance from productive to non-productive investment. Farmers think it:

- will create an excessive burden for an industry that carries the economy
- makes no sense and won't make an iota of difference to greenhouse gas production
- will destroy our profits and our resilience
- will erode our competitiveness if we are the only country to price agricultural emissions.

There is evidently a wide disparity between the seriousness with which central and regional government policy-makers are taking climate change, and the obliviousness of many community members to the issue and actions they could take to, for example, conserve water and help restrict the infiltration of new pests and weeds.

Views on resilience

Community members' definitions of resilience were similar to those which emerged in the literature, particularly literature on social resilience³. Key concepts were about pulling through during economically tough times, coping with change (and diversity), and supporting others.

People's perspectives on resilience were couched in holistic terms. They talked about changes that were taking place in rural New Zealand, about different ways of doing things, the need for more integrated thinking, and not least, what it was about their community that really mattered to them. For the most part people's views about resilience were expressed in economic and social terms and there appeared to be considerable agreement across the focus groups and from individual interviews.

Characteristics of resilient communities

Strong and viable economic base

The economic viability of farm businesses was a key issue. An important observation was the difference in the structures of the dairying and sheep/beef industries. Dairying was seen

³ See Volume 2, Background paper VI, and Chapter 4 below.

to offer more resilience than sheep/beef production because it is robustly connected to the market through a single desk seller. Sheep/beef producers on the other hand were dealing with a multitude of middle people who take a percentage of the returns. Against this, the high cost of dairy conversions and high level of indebtedness that can come with the fixed costs of operating a dairy unit means that dairying can also be vulnerable during periods of low returns. Those with a diverse range of income streams appear to be the most resilient.

The economic viability of communities, particularly the need for a diversified industry base, was also mentioned, and *“the rating base has to be large enough to cope with infrastructure development and other measures”*.

Stable succession structures

The changing demographics were of concern to those involved in the farm sector in that individual farm-family and farm and other business decisions multiplied across the community as a whole are likely to introduce major social change. Young adults tend to move out of the area once they have completed secondary school. The secondary students told us that if they return, it is likely to be in a different role (e.g. farmers’ children may return to take up a non-farm business or as small-block holders rather than buy a farm property).

Strong service infrastructure

Communities were said to be resilient when they have a good range of services able to provide the basic needs of the community – plus access to technology. Computers were seen as an essential tool for families, businesses and for farming – whether for fertiliser application (soil type, amount to apply, and GPS assisted locationing), genetic testing, processing and marketing, or for social connections. However, there is a need for adequate functioning broadband for computers to run effectively⁴. *“With probes set across paddocks, farmers can programme their home computer to check soil moisture and switch the irrigation on and off as needed”*.

Resilience was also seen as coming from *“having excellent quality services that are interconnected with each other. This enables people to work together as a community in a crisis”*. The loss of services (such as schools) was felt to contribute to loss of resilience in the community. Small councils (for example, those with fewer than 50 staff) may not have the resources to provide the range of services needed or desired.

Integrated approach to challenges and consensus decision-making

How people approach the challenges they face and how they deal with each other in working through issues, surfaced as significant facets of resilience in this study.

Communities become resilient when the beliefs of all stakeholders are being thoroughly canvassed and understood, and issues are debated from the perspective of the environment, the economy, society and cultural considerations.

Communities that take time to reach a consensus, and also take an integrated approach to decision making (that is, consider a multiplicity of issues simultaneously), were seen as being

⁴ 2006 census data shows that the closer to urban areas, the higher the proportion of population with internet access. Away from urban areas, for those who can afford it, satellite connections provide internet access but even then access and coverage can be poor quality and irregular.

resilient. An example of an integrated approach cited by a North Canterbury interviewee is aggregated consent entities (ACE). In these entities a number of farm businesses operate under one water consent. This enables farm families to reduce costs, have greater control over the environment: and act as a 'bloc' to compete against large corporate entities:

There are significant social and economic implications for farmer organisations when they represent multiple farm families of several thousand people, all with common economic interests and similar environmental perspectives. Such a collaborative ethos is a strong 'strategic defence' against sceptics, enabling whole communities to influence how we approach climate change as a nation and also how we influence our international trading partners.

High level of planning and preparedness for adverse events

Regional Council staff and Te Taiwhenua ō Tamatea both indicated they want to reach out to the wider community and had been working towards this for some time. However, some people considered there was a gap between people knowing what they want to do, and being able to actually do it, with community groups at different stages of readiness for networking and planning. The Canterbury Water Management Strategy which involves all stakeholders in decision making provides a model for consensus (and integrated) planning.

Planning for the management of adverse events is a strong feature of the work of several institutions and agencies. For example, Beef + Lamb NZ, Dairy NZ, farmer co-operatives like Farmlands, and corporates like PGG Wrightson, provide support and information on coping with snow, floods, landslips and other adverse events. Rural Support Trusts provide a free service to farmers to assist them work through adverse event issues. Adverse events are as diverse as floods, drought, snowstorms, financial, animal welfare, and personal crises. Being linked into local civil defence networks the Trusts are in a good position to assist the movement of stock, activate emergency equipment and resources, and also facilitate access to financial support, farm management advice, labour and sometimes just be a person to talk through issues and plans with. On the other hand, access to this support is patchy. Small-holders and local non-farm businesses do not have access to the Rural Support Trust facilitation yet are an integral part of the economic and social life of community.

While organisations such as Māori Women's Welfare League play a major role in supporting their communities through crises – whether long or short term – economic, environmental or social, their resources are limited and focused where the need is greatest.

A study by Waimakariri District Council in 2007 on emergency preparedness (WDC 2008b) found that 70% of households from the rural part of the district indicated they had enough water stored to last for at least three days in an emergency event, around 97% of respondents across the district had sufficient food to last for three days, 67% had access to a battery powered radio and spare batteries, and 94% had access to a torch with batteries, or other alternative lighting not requiring electric power. Some 82% of households across the District had the ability to heat their homes without electric power.

Because rural communities have dealt with adverse events (such as snow or drought) in the past, they have developed coping strategies they know will work. Such disasters are not seen as particularly problematic. Joint efforts involving all the community help people acknowledge their interdependence, link council and other authorities with the community,

and generate a positive community spirit. Likewise the value of community get-togethers is well-recognised.

Droughts are hardest to deal with because they can go on for years. The animal welfare issues just go on getting worse.

Droughts creep up on you and it's not easy to tell when the best time would be to come together, and to even know when the consequences of a drought are really hitting and people need some outside support. Incomes are down and having sold capital stock for a pittance people are still on overdraft long after the drought has broken.

Individual farmers can help themselves by 'future proofing' their properties. For example, despite the storm damage from the April 2011 event which destroyed properties around him, the tree planting by one farmer near Porangahau meant he "still has a farm because of the extensive preparation he did. This is real resilience".

There was a connection between positive views of disaster outcomes and the belief that people and businesses (on the basis of previous experience) have the ability to 'swing into action' and bounce back after disasters. However, positive views of outcome did not necessarily lead to preparedness. On the contrary it seemed that confidence in their ability to successfully take action in an adverse event led to some people believing that planning was not really necessary. For some farming families a certain degree of disaster preparation is part of 'business as usual', so may not be perceived as such. Rural Support Trust personnel, however, were concerned at what they saw as inadequate preparation.

Community participation and inclusive community networks

Strong community networks and participation in community activities appear to underpin all of the positive resilience factors. Communities were described as vibrant, energetic and supportive settlements, and people commented on their active social lives.

- People work hard to fund raise for amenities
- Everyone gets involved in something
- The farmers' market at Porangahau brings everyone together and attracts different elements of the population who would otherwise not mix
- The farmers' market in Oxford is a major draw card and brings in commuters from surrounding districts as well as Christchurch
- People said they had moved to the district because they like the community, the space, the neighbours and most of all they liked being able to participate in community activities.

Particular institutions play a key role. For example:

the school as an institution brings everyone together for social events, fundraisers, working bees, and so on. These kinds of activities tend to cut across social distinctions. It doesn't matter how long you have been in a community – but rather what you contribute.

Despite high levels of participation (for example, a 2007 Waimakariri District Council survey showed 60% of respondent households were involved in some form of community group [WDC 2008b]), there have been both subtle and large changes. For example:

- Farm owners' work regimes have shifted. They have less time to participate in local social and community activities, and do not regularly collaborate with neighbours to do farm work.
- People no longer want the kind of hospitality that was taken for granted a few decades ago (scones and the welcome morning tea).
- People do not network as much as they used to. They work long hours and are less available to support the local clubs or coach the sports team. There is a diversity of people which make it harder to mix *"In the old days the phones would run hot if anything happened. Now people hardly know their neighbours"*.
- With children taking the bus into the city for school *"there is nothing locally that draws the community together"*.
- Many people (from farms) travel into the cities to work, and then shop there, so local stores have closed - which also reduces the local informal meeting places.

We noted a tension between peoples' unanimous and deep-rooted view of their community as one in which 'we all help each other', and the conflicting idea (which emerged during focus group discussion) that they mostly help each other only within their own social groups.

Feedback indicated a low level of exchange and dialogue between Māori and non-Māori groups in general, despite peoples' best efforts, and it seemed that within the wider community there was probably limited knowledge of local marae, hapū, how they operate, and the activities they are involved in. Local marae, and some non-Māori, appear to be trying to remedy this by seeking more dialogue, exchange, and joint projects, with other sectors of the community.

Other groupings within the communities were also revealed. People did not identify any expressed hostility between the groups, but did acknowledge little communication between them. Interestingly, at a school age level, young people themselves felt strongly that the final years of school was the only context in which community 'group' distinctions didn't exist or matter.

Where people are willing to help each other, where there are strong networks, where people *'care and look after each other'* that is, are doing more than just working together, and there is strong social capital, communities are considered to be resilient. Ultimately, community resilience was seen as a function of how closely people were connected with others in their community: *"A lot of the time it depends on how in touch people are with their neighbours. If you don't know there is an issue you won't be there to help out. If you do, you take a casserole over. But there is less of that neighbourliness now than there used to be."*

The existence of strong community networks appears to be the single most important factor for community resilience. It is interesting that it does not appear to matter at all what the purpose is for coming together (for example, whether for social gatherings or for more formal purposes). It is the manner in which the networking is carried out and the nature and quality of the participation that counts.

Self belief

Many people talked about the 'rugged individualism' of farmers and their can-do attitude. There is a mantra of *"we can manage on our own"* with farmers in particular being seen, and seeing themselves, as self-sufficient. Older male farmers in particular *"don't talk about their*

problems". The 'battling spirit' is widely seen as the key to farming communities' strength and resilience. On the other hand, local community service organisations told us that some farmers underestimated their ability to carry on, and could go beyond the point of no-return: "if these people were more realistic they would get out of farming". Nevertheless, strong confidence of their ability to problem solve (based on previous experience) means farm people tend to be confident of their ability to individually and collectively deal with the immediate impacts of adverse events.

Positive profiling of the community

Aspects of trust were considered particularly in relation to how communities see themselves and are seen by others. Portrayal by the mainstream media (TV and urban newspapers) was seen as problematic. There was strong resentment at media misrepresentation as this was seen to not only convey false information, but also to polarise attitudes.

Community empowerment and institutional relationships

Within all the communities there was a strong expression of desire for community control of their own issues and decisions. Government regulation was seen as a greater threat to community resilience than natural events, particularly as many decisions are made by people lacking local knowledge. People said they were worried about the harmful results and damage to their communities of irrational decisions made by policy makers who do not know rural communities or understand how they work. Examples include school and hospital closures, inappropriate health and safety regulations, exploitation of volunteers, and so on.

Access to relevant information

Informed and aware community members were seen as critical for community empowerment. Scepticism by some that climate change is occurring, is itself an example of the need for meaningful information.

Strong volunteering ethos and capacity

There are several levels of volunteering in communities that have been affected by wider economic and social change:

- many communities no longer have the strong social neighbour networks that make it easy for the effective provision of spontaneous and short term voluntary help
- longer term volunteer services that have traditionally been built into the infrastructure have gone
- the demographic shift in rural areas has resulted in the loss of several cohorts of energetic young adults who would, in previous decades, have helped out.

Effective leadership

Some said that there was a good range of leaders in the community who came forward to lead the different projects, and this variety was seen as positive. Others felt that it was the same few people doing all of the hard work.

The key characteristics of good leadership were the ability of a leader to empathise (in particular those who had experience of adverse climatic and other events themselves, and could 'walk the talk' and could 'walk in others' shoes'), and to listen, genuinely consult and

take account of collective wishes. People were very clear that if you want to cope with adverse events, you need to listen to the community to find out what needs to be done, how it needs to be done, and by whom.

Leadership was seen as needed to encourage farmers to accept 'new' practices with environmental and climate change benefit.

Leadership is needed to improve the physical resilience (or environmental resilience) of hill country farming. The land is not homogeneous and not all is good for livestock production. Where it is highly erodible and production is poor, it should go into 'permanent foliage' (trees).

Willingness to try out new ideas or adopt new practices appears to depend very much on the way in which messages are conveyed. People had no difficulty in defining and articulating issues. They do not, however, wish to be 'told' how to do things by someone from outside of their community, and collaborative and partnership approaches from within the community would appear to be the most effective way of gaining acceptance. What seemed to be missing for them were the processes for sharing issues across all groups, and then following through with action.

Measures to maintain and enhance community resilience

Actions being taken to adapt to climate change

Research participants, and published sources, gave many examples of positive and effective actions already being taken to maintain and enhance community resilience. This includes a range of actions being undertaken by individual farmers such as easing back on stock numbers, planting trees, fencing and reticulating water, which are seen as effective preparations for responding to climate change. Undertaking these actions on a collective community basis, reaching across whole catchments, would be even more effective for mitigating and adapting to climate change. Many people see 'drought is the new norm' and that they need to manage to this.

Community initiatives to maintain and enhance resilience

In each of the case study communities some fundamental steps are being taken which are building community resilience. They include the schools' networked e-learning initiatives, work undertaken by the Oxford Community Trust, particularly with youth, the Amuri Dairy Employers Group, and the Canterbury Water Management Zone committees.

All these activities reflect collaboration involving a wide range of stakeholders, and using holistic and integrated approaches. The ability of the *community* to collectively influence change and make a difference came to the fore as being of greater importance than people's own individual ability to influence what happens within their community.

Community action was seen as particularly important for activating a response to adversity, such as identifying when to declare a drought emergency. Local leadership is available through, for example, the Rural Support Trust co-ordinators who are seen as working with families in ways that leave them feeling empowered and in control of their next steps. Others include the Oxford Community Trust's Social Services Coordinator, Rural Women and Māori Women's Welfare League, and the local volunteer fire brigades.

Valuable support material is available for community use such as the Canterbury *Integrated Recovery Planning Guide*. The difficulty is ensuring all groups are included. For instance, small-holder families though not primarily dependent on the land for their income may, for example, have difficulty accessing stock feed during prolonged drought.

Future measures to maintain and enhance resilience

To be resilient a community needs to find ways to bring its different social groups together. This is happening with concept work on a water storage dam in CHB and with the Canterbury Water Management Strategy. All the stakeholders have been involved at the pre-feasibility stage to find a way to develop water storage without damaging the environment. By bringing everyone together it is possible to break down barriers.

The advice of farm consultants, rural support and farming commentators alike is to do things collectively after an adverse event. The timing and method of information-giving during and after an adverse event is seen to be critical if the information is to be heard and used. For example, receiving comprehensive information (no matter how relevant and even necessary) did not generate the same positive response as the talks giving empathetic, practical and simple step-by-step advice by farmers who had 'been there before'.

Events such as drought have a long lead in time before the seriousness is widely recognised. Community meetings to discuss the situation and the signs may help more people to take appropriate steps earlier. (For example: *Night classes that were held in some districts for farm business owners have proven to be of great value in enabling the attendees to step back and look objectively at what they are doing*). All the award winning farmers were planning years in advance to be better placed to cope with risks and deal with inevitable adverse events.

Action in preparing for and dealing with adverse events is believed to be best taken in partnership between the civil agencies, institutions and the community. Important points include:

- when sharing information about climate change the 'how' with which it is shared (including timing), and the 'who' (trusted and empathetic community members) is as important as the information content
- in preparedness planning and in emergency response planning it may be useful to have information about the impacts of trauma on the capacity of people to absorb information, think and act
- social factors are by far the most important of all the factors contributing to resilience
- a strong shared sense of community identity is seen as an essential foundation for building other resilience factors
- while there was evidence of a strong and stoical community spirit in all three study areas, there is a need to increase networking across and between different groups in the community in order to sustain wider community resilience in the long term. The discussion groups indicated a real willingness to move in this direction.

Further investigation of some structural issues is likely to be of value. For example, the current short term of tenure of elected local authority members in office is seen as not conducive to dealing with issues like climate change. Also, issues like water access litigation

might be better handled through an inquisitorial approach rather than the adversarial approach currently in use in the Environment Court.

Resilient rural communities

The study highlighted the multidimensional nature of community resilience. Resilient communities have the capacity to adapt to challenges by using networks of resources that may be economic, social, and/or informational (Wyche *et al* 2011). Community members are effective in coping with adverse events when they know what to do, have worked together for a long time, value teamwork, and function as a group which values collective efficacy in serving their community.

The information and ideas provided by the members of the case study communities was in accord with the eight domains of resilience identified by Paton (2007) in the context of disaster management. Following this approach, resilient communities can be seen to be characterised by;

- connectedness, commitment, and shared values among community members
- participation by community members in the affairs of the community
- support and nurturance of the needs of community members
- the engagement by community members in critical reflection, problem solving, and skill building
- active communication
- the ability to utilise and obtain resources
- a structure of roles and responsibilities for leaders and organisations
- consensus approaches
- managing issues in an integrated way.

The study showed that the goals of community resilience when dealing with adverse events need to be broad enough to meet various community needs and include effective problem solving, interagency relationships, resource acquisition, policy development and implementation, and communication.

PART I: SETTING

2. EXPECTED IMPACTS OF CLIMATE CHANGE IN NEW ZEALAND

Climate change

'Climate change' is a significant and persistent shift in climate or its variability and predictability. Climate has changed over millennia and will undoubtedly continue to change in the future due to natural processes (AgITO 2010:9). Over the past 150 years, however, increasing industrialisation and human activity (such as industry, agriculture and transportation) is affecting the natural climate balance. These activities are increasing the amount of greenhouse gases in our atmosphere and causing the earth not only to heat up, but to heat up at an unprecedented rate (MfE 2011). The Fourth IPCC Assessment Report states that

Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level (IPCC 2007:30).

For example, global average temperature has risen by 0.74°C in the hundred years from 1906 -2005 (IPCC 2007:30). In addition to temperature increases, the process of climate change is bringing about more extreme events such as, floods, storms, cyclones, droughts and landslips.

Last year was the world's wettest on record, and tied 2005 as the hottest year since record-keeping began in 1880. New US figures confirm 2010 was one of the more remarkable years in the Earth's climate. It featured prodigious snowstorms in the US and Europe; a record-shattering summer heat wave which scorched Russia and massive floods in Pakistan, California, Tennessee, and Australia. The global average surface temperature for 2010 tied the record set in 2005. It was the 34th year running temperatures have been above the 20th century average.

NZ Energy and Environment Business Week (19 Jan 2011)

The main greenhouse gas increases due to human activity are carbon dioxide, methane, nitrous oxide and some synthetic industrial gases. New Zealand has a unique emissions profile for a developed country, since our agricultural sector produces the majority of our greenhouse gas emissions (mainly methane and nitrous oxide) (MfE 2011).

Developing and implementing strategies to cope with climate change now would have the benefit of improving the ability of farmers and growers to deal with climate extremes and variability that are already occurring, while increasing our capacity to absorb and even benefit from future change.

Climate change is an underlying trend that is already here, as an influence on our seasonal climate and on climatic extremes. The influence of this long-term trend is relatively small at present, but it is likely to increase over the coming decades, with a potential increase in the frequency and severity of extreme events, shift in yearly averages of temperature and precipitation, and probable changes to our present production systems.

Climate variability has a very strong influence on seasonal variations in production. Drought, as experienced in the north and east of the South Island, can have severe

and costly effects. Different regions and different sectors are affected in quite different ways, with a mix of costs and benefits in any given year (Kenny 2001:1).

According to the Ministry for the Environment, historical records show the national-average temperature can vary by up to about 1°C from year to year, and more than this on a seasonal timescale. The warmest individual years in our current climate have temperatures near the upper end of the projected average warming for the 2030s. This means that an unusually warm year now could be the norm in 30–50 years, while an unusually warm year in 30–50 years' time is very likely to be warmer than anything we experience at present. Similar comparisons can be made for rainfall. Areas that currently have water management issues will likely see present extremes (e.g. water shortages) become the norm by the 2030s (MfE 2008:14).

Climate change impacts on agriculture and forestry in New Zealand

As a biologically-based economy, New Zealand is particularly vulnerable to a variable climate. Recent changes are recorded in Map 1. Being prepared for on-going climate change will ensure the viability and competitiveness of farm and other rural businesses. As Kenny and Fisher (2003) note, variations in climate have the single greatest influence on year-to-year variations in New Zealand's agricultural production. With global warming, however, climate is expected to change even more rapidly than in the past, and it may vary more dramatically.

According to the IPCC Fourth Assessment Report climate change in the region of Australia/New Zealand has already occurred, with a 0.4 to 0.7°C warming and a sea-level rise of about 70mm since 1950. Warming means more heatwaves, fewer frosts and more rain in south-west New Zealand and less rain in north-eastern, and east New Zealand (IPCC 2007). The impact of this is increasing stresses on water supply and agriculture. IPCC (2007:50) predicts that:

- by 2020 there will be significant loss in biodiversity in some ecologically rich sites
- by 2030 water security problems will intensify in Northland and some eastern regions
- by 2030 production from agriculture and forestry is projected to decline over parts of eastern New Zealand due to increased drought and fire (although New Zealand may experience some initial benefits in some other regions)
- by 2050 population growth and on-going coastal developments are projected to exacerbate risks from sea level rise and coastal flooding.

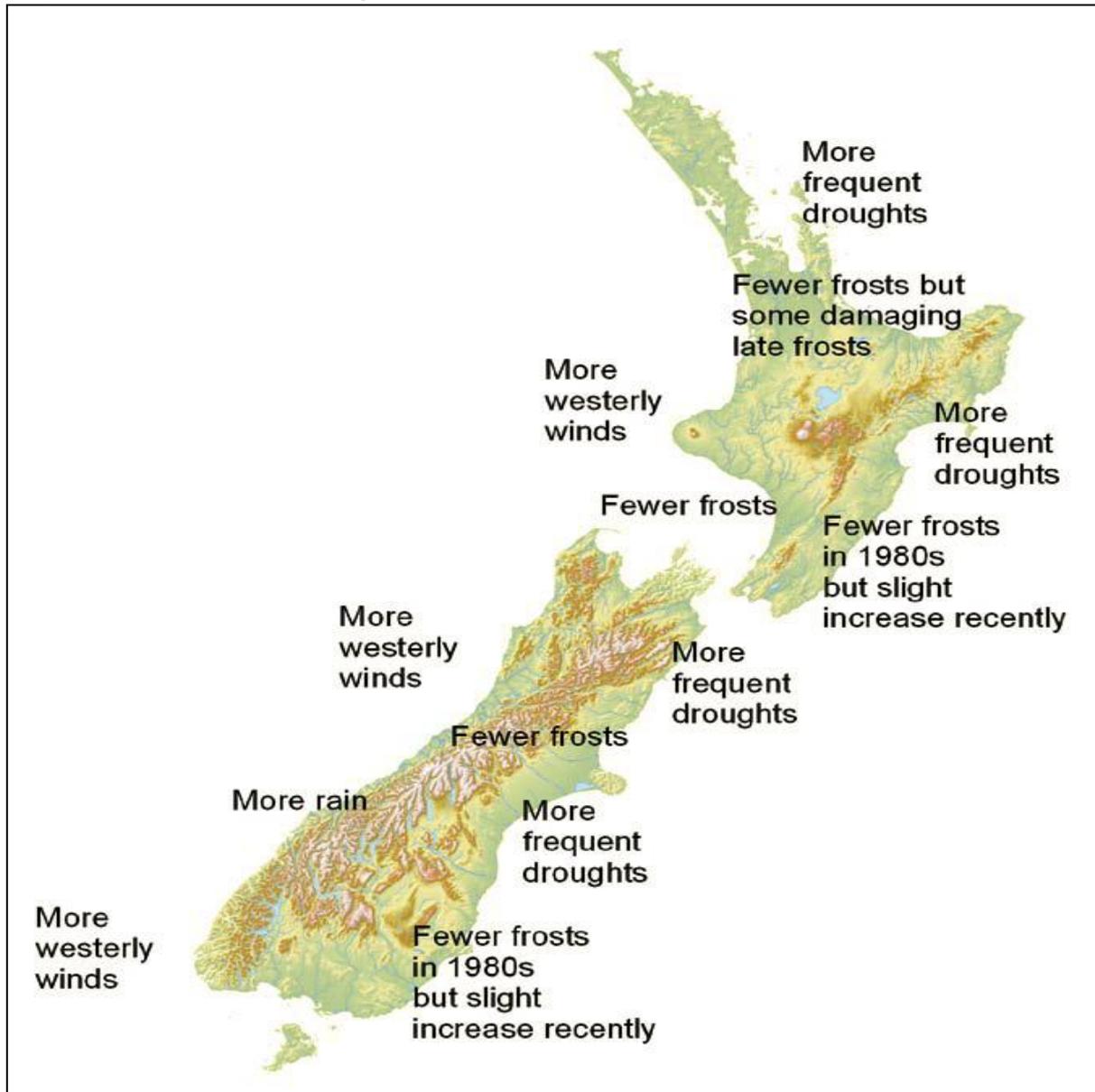
Adverse events are likely to occur more frequently as climate change accelerates. Larger, more frequent and more intense events are predicted over time. The effects of climate change are likely to be uneven, with some regions and primary production activities being more susceptible to adverse events in the future (MAF Policy 2006).

Projections for the agricultural sector include (MAF 2011a, Kenny and Porteous 2010):

- increased drought risk in already drought prone areas such as inland and north Otago, eastern Canterbury and Marlborough, parts of the Wairarapa, Hawke's Bay, Bay of Plenty, Coromandel and Northland
- non-irrigated land becoming less viable in the driest areas
- droughts expanding further into the spring and autumn months, as well as summer

- increase in very heavy rainfall in many parts of New Zealand, even in those areas where the annual rainfall decreases on average
- higher temperatures, with greater increases in the winter season and in the north of New Zealand
- increased risk of very high temperatures
- decreased frost risk
- increased risk of forest fire
- rising sea-levels.

Map 1: Recent climate changes



(Source: MAF 2010b)

While many climate change impacts are hard to predict (e.g. drought), or almost impossible to predict (e.g. floods), AgITO suggests that such events can be planned for and potentially avoided or adapted to by farm businesses modifying their management practices (AgITO 2010:11). Many farmers (particularly those in the east) are implementing a range of adaptation measures (Kenny 2005, Salinger 2005).

3. SUMMARY STATISTICAL REVIEW AND REVIEW OF LITERATURE ON NEW ZEALAND'S RURAL COMMUNITIES

Demographic change in rural New Zealand

Future climate impacts will bring major change to rural New Zealand – which has already experienced significant change over the past three decades. While the proportion of New Zealand's population that is rural⁵ has dropped by only 1% (to 14%) since 1981, this means that there are still only just over half a million New Zealanders living in rural areas – one in eight people. The most strongly rural regions are Northland (with just under a half of its population located in rural areas), West Coast and Tasman. The largest share of New Zealand's rural population is found in the Waikato (16%), followed by Canterbury (14%).

One of the more significant changes is in the rural age distribution which shifted from the traditional pyramid shape in 1981, to by 2006, one with heavy over-representation of mature working age adults 40-64 years and their children⁶. The 2006 rural age distribution has a tiny 'waist' of 20-30 year olds. This picture is very different from the urban age distribution which remains much closer to the traditional pyramid shape. The 2006 rural age distribution was generated by very high rates of net out-migration of people 15 to 24 years, balanced by high net in-migration of people aged 30 to 44 years and their children.

This age structure means that there is a general shortage of people in the age group that would be expected to provide the core of voluntary services in rural areas. In addition it is likely that rural New Zealand businesses are experiencing a turnover of the generations. The older age group may well be fitter than previous generations and working for longer, but there may also be a proportion of the younger population that has left and may not be replaced (although it may still be too soon to gauge whether this is an issue). This may have implications for how rural communities cope with the impacts of climate change in future.

The age distribution of rural Māori was very different from the non-Māori rural population in 2006 in two ways: there were fewer elderly – reflecting the disparity in health status between Māori and non-Māori (National Health Committee 2010:57) and a much greater proportion of Māori children and young people under 20 years (particularly 5-14 year olds). In time this group is likely to have an important leadership role in responding to and mitigating the impacts of climate change.

Labour force trends in rural New Zealand⁷

Jobs in rural New Zealand increased by around 50% between 1981 and 2006 (although the trend has not been linear), with a marked increase in the participation by women in the labour force (similar to the urban trend), and a shift in the kinds of jobs undertaken by men.

The industry mix of jobs held by rural residents has shifted away from agriculture to other industry sectors at successive censuses over the 25 year period. Whereas 49% of jobs held by rural residents in 1981 were in agriculture, by 2006 this figure had dropped to 29% (and a further 3% worked in the other primary industries). By 2006 the majority of rural people (59%)

⁵ That is, living outside centres of 1,000+ people (see Appendix B).

⁶ See Volume 2 (Background papers III and IV) for a fuller breakdown and analysis of demographic and labour force change in rural New Zealand.

⁷ Data compiled by James Newell (MERA) (Newell 2011)

were employed in the service sector (including building and construction), while a further 9% of rural residents worked in the manufacturing sector.

On the other hand, 50% of the jobs in rural New Zealand are in primary industry, and a further 11% of rural jobs are in manufacturing (with a strong focus on food processing).

Complicating the picture are two trends: multiple job holding and commuting. While multiple job-holding (pluriactivity) has always been a feature of the New Zealand labour market, the data shows that since 1981 this trend has grown more strongly in rural than in urban areas.

In 2006 around 200,000 jobs were located in rural areas, while just over 300,000 jobs were held by rural residents. This implies that despite rural residents' multiple job-holding, given that urban people are also commuting to work in rural areas, at least one-third of rural residents commute to work in urban areas. Two-way commuting accounts for the high proportion of rural people working in the service sector, while the work in the agriculture sector still gets done. The importance of service sector employment also reflects the increasing significance of rural tourism.

The combination of the daily commute of rural people to urban areas, and the likely lesser attachment of urban-rural commuters to their rural work locations, impacts on the availability of people to participate in social activities and provide voluntary services in rural areas. This has a direct impact on the building of social capital and resilience. A further impact of commuting is that people are less able to see what is happening on their properties when they are absent during daylight hours. This may become problematic for taking prompt action to prevent the infiltration of new biological species as the climate shifts⁸.

Income

People living in rural areas with a high urban influence have the highest median personal income (\$28,600 p.a. as against a median of \$24,400 p.a. for the whole of New Zealand) reflecting lifestyle residence, whereas the median of those living in highly rural / remote areas is below the New Zealand median (at \$23,100 p.a.).

Changes in farming and employment within the farm sector

Population Census data shows a decline in the number of jobs in agriculture for New Zealand as a whole, particularly in the pastoral farming sector (53% of agricultural jobs in 1981 were in sheep/beef production – and this had fallen to 44% in 2006) while jobs in dairying have fluctuated and slightly increased (29% of agricultural jobs in 1981 to 31% in 2006) (Newell, 2011).

While accurate information is hard to find on farm property trends, John Fairweather and Stephanie Mulet-Marquis' analysis indicates an overall decline in the number of farms since the 1970s. The proportion of larger and smaller properties has increased at the expense of mid-sized properties (Mulet-Marquis and Fairweather 2008:8), particularly in the dairy sector. The declining numbers of farms appears to be due mainly to a decrease in the numbers of pastoral (grazing and fattening of sheep/beef) and grain farms. This information tallies with Beef + Lamb NZ's Economic Service data on stock numbers. This shows sheep and cattle

⁸ Ecological changes and potential increases in hazards from shifts in farming patterns are beyond the scope of this report.

numbers falling while dairy cattle have increased in number. It also tallies with the population census data on changes in the jobs in the different agriculture sectors.

Certainly the area in farmed pasture dropped by about 20% over the 25 year period. While forestry expanded in the 1990s, current market returns are pushing the conversion of plantation forests into dairy farms, with water being the biggest limitation on dairy expansion (Beef + Lamb NZ Economic Service 2011), although there has been a sharp drop off in conversions since the introduction of the Emissions Trading Scheme. Horticulture and viticulture have expanded (reflected in the increase in the proportion of agricultural jobs in this sector from 16% in 1981 to 22% by 2006). Other economic pursuits that emerged in the period include venison and other deer products, and the growth of activities such as farm-stays and eco-tourism.

These changes also impact on social network building and on prompt disaster responses. Changes in the pattern of farming and in the numbers of people available to participate in voluntary activities have created problems for fire and ambulance services in some areas (e.g. people are unable to instantly stop milking to attend fires and accidents).

Changes in New Zealand's rural communities⁹

The shocks which rocked the primary sector from the 1970s (including the oil crises, loss of traditional markets, droughts and other adverse events and changes in economic management in the 1980s and 90s) also impacted on rural communities. While farming has changed, the communities in which the sector is embedded have also changed. Where once the mutual dependence of the agricultural sector and rural society on each other was a given, this is no longer the case. The economic linkages between the farming and forestry sectors and their local communities have loosened. The shift of services and staff from the small rural centres to larger centres and cities, the commuting by rural people to larger urban places for schooling and work, and the disintegration of many traditional community structures are all a challenge to social cohesion (and, as shown through the case studies, to the resilience of rural communities).

The changes, as documented in the literature, caused a run-down of social capital in New Zealand's rural communities in the post-1984 era (Bedford *et al* 1999). Communities were no longer 'close knit' (Little *et al* 1998a), and where once people knew everyone, this was no longer the case (Taylor *et al* 1998).

Patterns of landownership changed as pastoral farming gave way to dairying. The newcomers included corporate owners, wealthy families, and not so wealthy risk takers with the 'fortitude to cope with the massive debts from converting sheep properties to dairying' (Little *et al* 1998b).

Technological changes have meant that intensive sheep/beef production can be managed by one person with the help of agricultural contractors who may come from outside the district. Workers generally are mobile. Dairying currently requires several labour units, but dairy workers are particularly transient due to the way the industry is organised. Although new families were coming into rural districts, the constant shifting to new properties (for example, four moves in 10 years, often as part of a career progression, in districts where you need to live for 40 years to be regarded as 'a local') gave these people little time to get to know other residents, contribute and participate in local activities, and develop close social ties and networks.

⁹ See Volume 2 (background Paper II) for a fuller analysis of rural community change.

Initially in the traditional sheep/beef districts dairying was not a highly rated occupation so that as more dairy conversions took place, social divisions (the classic ‘them and us’) emerged (Little *et al* 1998b). Newcomers often did not identify with the community and brought new and different ideas and approaches. They also often found it difficult to meet people. For their part, many long-term residents (particularly pastoral farmers) did not immediately understand the (time and financial) pressures on dairy farmers. In many districts it took time to recognise the different routines and work patterns of the different types of farming, and the need to reorganise community activities so that dairy-farm owners and workers could participate. While newcomers often had little discretionary free time in which to join local activities, longer-term residents sometimes wondered about making the effort to welcome people (especially workers) who were not going to stay (Smith 1991).

Another trend has been the shift of women into paid work, and men and women working in multiple jobs (‘pluriactivity’). Adverse events and the economic downturn legitimised commuting for work, but combined with lack of access to child care, this was (and is) another pressure on people’s availability to participate in community activities or voluntary work.

With many rural communities losing people (particularly the out-migration of young adults), and the change in work patterns, fewer people were (and are) available to run community services. Fewer leaders and people with the skills to manage and administer community organisations make it difficult to get new projects started. When enthusiastic newcomers started projects, then left, long term community members were faced with completing them. Many rural volunteers consequently suffered overload and burnout. This was compounded by people feeling pressured to keep services operating locally so that the same people ended up on the different committees (Liepins 1998, Taylor *et al* 1998). As the literature on resilience shows¹⁰ effective local leadership and a skilled population capable of problem solving, are important attributes of resilience.

Similarly although many rural communities were rejuvenated by people commuting in for work on a daily basis, these people were not around to participate in community and voluntary activities and services. The permanent residents often felt that a ‘sense of community’ was missing or threatened.

With improved roads and telecommunications supporting the growing pattern of commuting, the choice to purchase goods and services outside the community was easily justified as economic pragmatism (Liepins 1998). Alongside this shift, however, there were numerous examples in the literature of rural communities pulling together to maintain basic services locally, such as the general store, hospitals and health services.

People faced difficulties if they did not have access to good transport, such as beneficiaries who took up opportunities for cheap rental housing. People in more depressed rural communities sometimes also became trapped when they were unable to sell up and move (Bedford *et al* 1999). At the other end of the spectrum were the ‘small-holders’ and ‘rural-residential’ owners who brought new and different perspectives into the community. Social divisions between groups were noted (see, for example, Taylor *et al* 1998), and also the potential for conflict (Bedford *et al* 1999).

¹⁰ See Volume 2, Background Paper VI Literature Review – Rural Community Resilience

4. RURAL COMMUNITY RESILIENCE – INTERNATIONAL LITERATURE

To provide a platform for investigating the key aspects of resilience important for assisting New Zealand's rural communities adapt effectively to climate change, literature on resilience was reviewed¹¹. This literature shows how mutual support works to build resilience and adaptation to change at the community level. It also identifies the kind of backing and interventions that are helpful for encouraging and enabling rural communities and primary sector industries and organisations to adapt to the consequences and opportunities of a changing climate.

Community

The term 'community' is used in the study to refer to groupings of people resident in a particular place (some of whom may commute to work elsewhere). Account is also taken of the social and cultural aspects of 'community', of the 'roots' which form for many rural residents from long term association with a geographic area (childhood associations as well as family links, and for Māori, ancestral links – *turangawaewae*¹²).

Rural communities include farming communities but are not synonymous with them. As noted above, only 32% of the working population resident on New Zealand's rural areas in 2006 was engaged in the primary industry sector. Of those, many lived in households where income earners ran other businesses or held jobs not connected to agriculture, and not necessarily located in a rural area. Rural communities also include people who have, or are seen to have, little interest or stake in their geographic community of residence or work.

In other words, rural communities, as communities of place, contain many social groups, communities of interest and 'sets of relationships'. Some of these groups of people come together with an interest in a common activity, which may arise from the shared locality, but may equally arise from a common cultural or historical identity or through networking with others with shared interests or concerns that may overlap and expand beyond the geographic community. Rural communities are "*a constellation of smaller, complexly connected communities*" (Liepins 1998).

The notions of 'community good' or 'sense of community' can be used by community leaders as a tool for encouraging particular behaviours and actions among residents. These can be useful in coping with change or dealing with adversity.

Resilience

Resilience is a term that has been used in many academic disciplines since it emerged in the 1940s, including across the physical and social sciences. It is the ability of a system (in this context a rural community) to maintain its integrity and identity following natural or human-induced shocks – to "*undergo change without crossing a threshold to a different system regime – a system with a different identity*" (Walker and Salt 2006). Community resilience is "*having the capacity to take intentional action to enhance the personal and collective capacity of citizens and institutions to respond to and influence change*" (Colussi *et al* 2000), being able to 'bounce back' after adversity and, in the context of climate change, not only maintaining but improving the quality of life (Paton 2005).

Critical to understanding resilience is recognition that systems (such as communities) are integrated, and change cannot occur in one part of the system without being felt in other

¹¹ See Volume 2: Background Paper VI for a more detailed analysis of the literature.

¹² See Appendix A: Glossary and abbreviations

parts of the system. Achieving resilience also requires moving away from thinking based on 'system-near-equilibrium' approaches, to planning adaptations which allow successful navigation of change (Darnhofer *et al* 2010).

Social and other capitals

An important contributor to community resilience is a community's capital assets, particularly human, institutional, cultural and social capital. The value of these forms of capital is fairly self-explanatory (e.g. human capital – people's knowledge, skills, competencies, and so on; institutional capital – linkages between the public and private, particularly not-for-profit, sectors; and cultural capital – the values, history, traditions and behaviours that link specific groups of people) (Saunders *et al* 2011). Possibly even more important is social capital, particularly bridging social capital which develops between people who may initially be strangers. Social capital involves relationship building, networking and cooperative activity that builds trust and enables people to work together to achieve common goals and shared objectives, knowing (without formal commitments) that contributions to the common good will be reciprocated.

Social capital requires collective action. The bonds that quite diverse groups of people build with each other through being in the same locality, maintaining contact, communicating, working together and pooling resources, generates social capital. Robust and extensive networks assist in accessing resources and enable rapid response to adverse events/disasters. Strong social connectivity facilitates well-being and co-operation for mutual benefit. The networking and 'caring for our neighbours' (Reid 1998) enables solutions to be found that individuals could not reach on their own. All this contributes to community resilience.

In addition to robust capital assets particularly of social and human capital (capable people with knowledge and skills), other facets of resilience include having in place (Ross *et al* 2010, Ungar 2005):

- processes/activities, services (including social services) and infrastructure that support people and meet community needs (including social needs such as social justice), and provide knowledge and opportunities for learning
- supportive and engaged governance enabling collaborative decision-making
- a strong and diversified local economy
- processes to recognise people-place connections (human-environment interdependencies and stewardship), and
- systems that support and maintain strong indigenous culture (Ross *et al* 2010).

Māori and resilience

An attribute and strength of Māori culture is the collective approach and 'social memory' which captures the experience of past changes and enables development of appropriate strategies to deal with on-going change (Durie 2005, Lambert 2008). Cultural resilience (and arguably cultural capital) has enabled Māori society to deal with vulnerabilities created through alienation of around 90% of their lands.

Lambert emphasises environmental responsibility, esteem for assets (tangible and intangible) passed down, respect for the individual alongside consensual decision-making, obligations of hospitality and acknowledgement of kinship bonds, as cultural components contributing to Māori resilience. Added to this is the recognition that innovative practices are

necessary so that change is accommodated in ways that do not fundamentally alter system structure (Lambert 2008).

Nevertheless many Māori communities have limited economic resources, low levels of technology, poor information and skills, inequitable empowerment and representation, and are wary of Government intervention and failure to consult and listen (King *et al* 2010, Harmsworth and Warmenhoven 2003). Despite this, King *et al* conclude that vulnerabilities to the risks of climate change can be reduced by adaptation and strengthening capacities at all levels, and planning early for future impacts of climate change.

Rural community resilience

Literature which focuses on community resilience echoes much that has been learned from the range of disciplines interested in this concept. A major study undertaken in Stanthorpe Queensland Australia identified 11 facets of resilience (Hegney *et al* 2008). They were:

- social networks and support – bringing a sense of belonging and identity which can influence community functioning
- positive outlook – enabling adversity to be overcome
- learning – enabling the broadening of outlook, development of new interests, generating self-esteem and self efficacy
- early experience – shaping attitudes and values (although a handicap where dysfunctional experiences prevail)
- environment and lifestyle – fostering wellbeing and community pride
- infrastructure and support services – important for conducting everyday activities as well as quality of life
- sense of purpose – common objectives and working together supports resilience
- diverse and innovative economy – strengthens the economic base of a community
- embracing differences – builds new perspectives and different ways of thinking, as well as access to different knowledge bases
- beliefs – brings additional meaning and purpose to people's lives
- leadership – at its best, facilitates the achievement of goals by encouraging effective performance, but at its worst constrains by creating barriers. Leaders come from many quarters including family members and organisations.

These eleven components of resilience later became the basis for a toolkit on building resilience in Queensland's rural communities. They are very similar to the domains of resilience which have emerged from parallel work on community resilience in the context of disaster response and planning.

There has been growing interest over the past decade in the attributes of communities that recover from disasters with little or no external assistance. Emergency authorities are now beginning to be attracted to the idea of involving whole communities in disaster management and recovery, rather than just working with individuals and families.

Factors such as information, communications, sharing knowledge, emergency preparedness, political stability and economic health are all now receiving attention. A review by Manyena (2006) on community resilience identified that people want more than just attaining the minimum standards of coping or reducing their vulnerability to disasters. People want to build local knowledge, augment their existing capacity, take responsibility for action (including doing such things as buying insurance), develop a disaster plan, build their capacity to implement the plan, and share information on recovery priorities.

Through extensive international research on disaster management and community resilience carried out by Douglas Paton (2005, 2007) and others, eight key generic attributes or domains of community resilience have been identified. While these are predominantly psychological, they also encompass social, cultural and political facets of life. Action to build resilient communities occurs at three levels: personal, community and institutional.

At the personal level people take a range of actions which involve others in their local networks. These range from informal discussions identifying hazards, and what can be done about them, to making plans and carrying out the various steps, identifying likely challenges and how to handle them. People expect to make a difference and expect that to make preparations like these is not difficult. Psychological barriers at this level include people believing that they do not have the skills/capacity to problem solve and make a difference, or that whatever they do will not be enough, or that the problem will somehow go away if they ignore it – so do not bother doing anything.

At the community level research shows that active engagement in community affairs enables people to contribute to achieving community goals. Such engagement also builds critical social networks. By being involved in community activities people develop their individual and collective problem solving skills. They also learn or hone other skills such as articulating their personal opinions in public – even when they know that their point of view may not be popular, and learning how to be an effective leader, or supporter. How a community see problems and responds to them impacts on what is done about such problems.

The relationship people have with various institutions also impacts on resilience. For example, where there is trust and respect, where communities are supported by their institutions and agencies (such as the local council), and institutions encourage community-led initiatives, there is resilience. People feel empowered, they see positive consequences of participating in community activities (such as voting), and that this can affect their own lives, and so they take an active part in keeping their community going (Paton 2007:34). People also need to have confidence that their news media will report fairly, and that the law will protect and maintain order in their community (Paton 2007:35).

The eight domains cross the three levels of personal, community and institution noted above. They are:

1. awareness of climate change issues
2. action coping – taking action as individuals or communities to deal with or mitigate the effects of climate change/adverse events
3. outcome expectations – actions to increase expectations of positive outcomes from preparing for climate change/adverse events, demonstrating belief in the benefits of being prepared as individuals and communities; reducing expectations of negative outcomes and increasing individuals and communities' belief that what they do will make a difference
4. self-efficacy – or confidence in one's ability to problem solve successfully
5. community participation – the extent to which individuals and families are actively involved in community affairs and projects, and the extent to which people network and undertake activities together

6. articulating problems and solutions and demonstrating leadership – demonstration by the community of its ability to resolve common issues and deal with adverse events collectively
7. empowerment – the ability of individuals to influence what happens in their community
8. trust – the level of trust people have in different organisations - formal and informal, official and unofficial.

These eight domains contributed to framing the analysis of information provided by the selected case study rural communities and the interviews with national level community and industry sector organisations. In addition people-place connections and cultural diversity were also considered, as were other issues raised during the field work process.

Part II: CASE STUDIES

5. METHODOLOGY

Selection of the case study communities

The three communities which were selected as case study communities were the North Island's Central Hawke's Bay (CHB) District, and two adjacent areas Hurunui District and Waimakariri District in North Canterbury in the South Island. They have a number of geographical features in common: location on the dry east coast, subjection to adverse events such as drought, intense storms and flooding, and a similar distribution of farm types¹³.

The three areas differ in their degree of rurality and urban influence¹⁴. Hurunui at one end of the continuum is highly rural and remote, with low urban influence (and 88% of its population is rural). At the other, Waimakariri is rural with high urban influence, and is in close proximity to Christchurch (New Zealand's third largest city). It has two secondary urban centres within its boundaries (Kaiapoi and Rangiora). Only 34% of Waimakariri District's resident population is rural. CHB falls in between the two North Canterbury study areas in terms of urban influence. It is predominantly rural with low urban influence, and while 54% of its population is classed as rural, the remaining 46% of its people live in two minor urban areas 8 km apart. CHB is within commuting distance of the twin cities of Hastings and Napier.

Another defining difference between the case study areas is the much higher proportion of Māori living in rural CHB (18%) compared with the two South Island case study districts of rural Hurunui (6% Māori) and rural Waimakariri (5% Māori)¹⁵.

Tāngata whenua in Central Hawke's Bay (Ngāti Kahungunu) and North Canterbury (Ngāi Tahu) were subjected to illegal land purchases and contested land sales during the 1840s and '50s and Ngāti Kahungunu lost land during the 20th century due to compulsory acquisition. This resulted in Māori in both areas being dispossessed by Europeans of most of their lands from the 1850s (the era of the 'wool barons'). Ngāi Tahu's claim was finally settled only in 1998.

Of the three case study areas CHB has the largest proportion of population with a low socio-economic status: 30% of its population is in the lowest three deciles compared to Hurunui's 7% and Waimakariri's 9%. The North Canterbury case study areas had over a third of their populations in the top two deciles.

Farming in the three case study areas is predominantly sheep/beef production. Initially established under dryland farming conditions, the availability of water storage and reticulated water supply and irrigation schemes in recent years have transformed farms in the case study communities. Water has enabled dramatic increases in production and conversion of some farms to dairying. While the proportion of farms in dairying is small, it is significant where it occurs. Hurunui has the highest average herd size in New Zealand with herds averaging 848 cows (DairyNZ 2010). Hurunui also has the highest average production per

¹³ See Volume 2, Background paper V for a wider discussion of these case study communities.

¹⁴ See Appendix B for definitions.

¹⁵ Note: for New Zealand as a whole rural Māori make up 16%.

herd in New Zealand with 326,768 kilograms of milksolids. CHB, with an average of 218,771 kilograms of milksolids, has the highest milksolids production per herd in the North Island.

Waimakariri differs from the others in that it has a large small-holder population (farms between 2 and 8 ha). Waimakariri District Council's research on this group of residents in 2006 found that many of these farms were used for fulltime or part-time horticultural enterprises, including vegetable and flower growing, fruit and nut trees and olives. In one instance co-operation between adjacent small-holders enabled a vegetable growing enterprise to be developed. Other properties were used for grazing sheep, often for neighbours, and for grazing horses (mostly for recreational purposes), and woodlots. Some 28% of small-holders ran a home-based commercial enterprise that did not involve land-based production (WDC 2007). These included engineering or manufacturing businesses and servicing businesses and consultancies.

CHB has a number of horticulture properties (vineyards, pip and stone fruit, vegetables, flowers) and some grain crops and a small commercial forest under Crown licence (over which Pan Pac currently has cutting rights). Hurunui and Waimakariri have areas of plantation forestry, most of which is owned by Matariki under forestry rights with Ngāi Tahu.

In 2006, the proportion of rural residents with jobs in primary industry was highest in CHB (45%), closely followed by Hurunui (42%). Waimakariri had the lowest proportion of rural residents working in agriculture (18%, well below the New Zealand figure of 32%)¹⁶. Multiple job holding was highest in Waimakariri (21% of its rural working age population had more than one job).

Takapau in CHB had the highest proportion of residents with manufacturing jobs (47% of employed residents – mostly in meat processing), followed by Waipukurau, Otane and Waipawa (although many of the food processing jobs in these centres have been disestablished since 2006). In North Canterbury Hurunui, Hanmer Springs and Cheviot (followed by Culverden) had high proportions of residents working in food services and accommodation reflecting the growing tourism industry based on Hanmer Springs. All three study areas had sizeable proportions of residents employed in government, community, social and personal services (particularly in the minor urban and rural centres).

Approach to the case studies

A two pronged approach was taken to understanding aspects of resilience important to New Zealand's rural communities:

- (a) Development of an overall picture of national sector views on climate change and rural community resilience through interviews with a range of national level representatives and leaders of rural organisations and industry sectors, regional and central government
- (b) Discussion about resilience issues with people from the case study communities through a combination of focus groups and one-to-one interviews.

Following initial meetings with MAF, local government, community and industry sector leaders, and in CHB representatives of the local marae, a set of contacts was developed for each case study area. These contacts also provided further contacts through a snowballing process.

¹⁶ See Vol 2, Background paper V, Table 11 (page 44)

Sector views

Information was sought from representatives of the agricultural, forestry and government sectors, and from rural regional and community leaders, to gain a sense of official perspectives on climate change, and on what actions and responses might already be in place, both nationally and in the case study regions. Secondary sources including publications and websites were also consulted. Sector perspectives were also provided by some of the people interviewed as part of the case study community interviews (see the 'interview' list below).

Focus groups

Six focus group meetings were held in the two study areas. The contact list developed for CHB was used to invite people to two focus group meetings there. In addition, Te Taiwhenua ō Tamatea hosted a preparatory meeting for us, and as a result sent out further invitations to the CHB focus groups. Attendees at the two North Canterbury focus groups were contacted by the focus group leaders who were familiar with the communities through their agribusiness and research connections. In addition, two one-hour discussion group meetings were held with 23 Year 12 and 13 Geography students at a local CHB secondary school. Some of those who participated in the focus groups were also interviewed individually.

In CHB meetings were held at the Te Taiwhenua ō Tamatea rooms in Waipukurau (dinner meeting) and the Council Chambers in Waipawa (breakfast meeting). In North Canterbury, dinner meetings were held in Culverden and Oxford. Meetings ranged from 5 to 15 attendees. This provided opportunities for a deeper discussion and exploration of the ideas and experiences of participants, and allowed the participants to express as wide a range of views as possible, and to question and challenge their own and each others' views.

The focus group facilitators used a community development 'grassroots' approach. Principles underpinning the facilitation included:

- Recognition that the stakeholder is the expert
- Inclusive and participatory processes
- Genuine consultation, with all views equally valued
- Protection of confidentiality
- Partnership under the Treaty of Waitangi
- Recognition of vulnerability where there is a small sample in respondent groups
- Transparency of the research process, including feedback of findings to all participants.

The small numbers in all four community focus groups allowed the facilitators to use a whole-of-group approach, with one facilitator primarily taking notes, and the other facilitating the discussion. Notes were taken on large paper visible to the group, and were open to correction/adjustment by the group, both during the sessions and afterwards.

The focus groups allowed open-ended discussion around a set of questions and themes generated from the literature. The question areas were provided to participants prior to the meetings allowing them to start generating ideas. Questions sought peoples' views on:

- The concept of resilience – what does it mean?
- Characteristics of a resilient community
- Factors that threaten, or are barriers to, resilience

- Future possible actions that can be taken to build resilience
- Useful insights for MAF.

While people were aware that the study was about rural resilience in the context of climate change, the facilitators made a conscious choice to focus group discussion on resilience in the context of adverse events rather than climate change *per se*. As with similar studies (e.g. Weaver 2008) it was felt that people were more likely to participate at meetings which looked at the impact of change and community resilience, and not be sidetracked into discussions on perceptions of the validity of climate change science. However, facilitators were also keen to hear peoples' thoughts on climate change when these emerged, as this enabled some comparisons to be made with sector views on climate change.

Interviews

In addition to the focus group meetings, around 50 mostly one-on-one interviews were held with people from the case study communities, and with leaders or representatives of national and regional organisations linked with the rural or primary industry sectors, as follows:

Banking and finance	Farming (dairy, dairy support,	Māori Women's Welfare League
Beef + Lamb NZ	sheep/beef, other livestock)	Retail/food/accommodation
Central government officials	Fertiliser reps	Real estate
Community organisations	Forestry sector	Rural/farm media
Crown Research Institutes	Federated Farmers	Rural Women Inc
Church groups	Fonterra	Rural Support Trust
Education sector	Food processors	Small farming
Farm consultants	Health sector	Sports clubs
Farm forestry	Local and regional govt (staff,	Te Taiwhenua ō Tamatea
Farm suppliers	elected members, LGNZ,	Volunteer Fire Brigades
	SOLGM)	

Interviews were open-ended and followed the key themes explored in the focus group meetings. The information from both interviews and focus groups forms a narrative which illustrates and informs each of the eight domains of community resilience. In some cases the information provided signals non-resilient characteristics and behaviours. As with the focus groups, there was no debate over the opinions and perspectives of the people interviewed, and every effort was made to accurately capture the views presented.

In order to ensure discussion was as free and frank as possible, participants were assured of confidentiality.

Timing

During the period of the field work, Christchurch was experiencing on-going earthquakes. This made everyone nationally very aware of adverse events (even residents from Hawkes Bay talked of travelling to Christchurch to participate in the 'farmy army'). Apart from severe damage in Kaiapoi, the quakes mostly did not appear to directly impact on the North Canterbury case study areas (although there were indirect impacts such as the influx of shoppers and other service users to Waimakariri's retail centres).

CHB was itself affected by floods and land slips in late April 2011 immediately prior to the field work in that area. The public storm damage meeting held after this event in the Waipukurau

Hall was attended by around 120 people including about 60 farmers, and provided some useful insight into community response to an adverse event for the focus group facilitator who attended the meeting. The facilitators in CHB were aware that the timing for the focus groups was not ideal for participants given the community's preoccupation with immediate and important response to the flooding. Facilitators did not find that people were less willing to take part in the research, but that some were simply unable to. This was reflected in the smaller numbers than expected in the CHB focus groups. However the immediacy of the events, and the acute level of awareness in the community undoubtedly added value to all of the feedback.

Findings from the case study research

The following sections record the experiences of people from the case study communities and provide an insight into how, in 2011, members of some of New Zealand's rural communities view their communities and the issue of climate change, how they network and engage with others in their communities and elsewhere, and how these actions and their attributes contribute to the resilience of their communities.

In presenting the research feedback we have avoided where possible identifying specific locations, or have referred to locations in general terms. Anonymity of individual contributors has been preserved, except in cases where information or personal opinions are from published sources or are in the public arena (such as from publicly accessible websites).

Additional commentary to expand and elaborate on the observations offered through the interviews and focus groups is provided under the '*Comments*' heading after some sections.

Where relevant pertinent additional secondary source information has been quoted (and acknowledged).

6. PERSPECTIVES ON CLIMATE CHANGE

SECTOR VIEWS ON CLIMATE CHANGE

AGRICULTURE

Parts of the agricultural sector are spending considerable sums on research and development on climate change science. Agricultural consultancies, the Dairy Industry, the Rural Support Trusts, and others provide advice for dealing with extreme climatic conditions including managing through drought, tax management, animal welfare, and coping with stress.

Sheep/beef

Beef + Lamb New Zealand¹⁷ Economic Service's official view is that climate change is a topical issue and that there is a need to respond. Many of the issues which are currently engaging the Service, such as food safety and security and the drive to build-up markets in Brazil, Russia, India and China, can also be seen as climate change issues. More people in the world means increased demand for food and more people affected by climate induced adverse events. Other countries will be affected by climate change, but just what this means for New Zealand agriculture and rural communities is not yet clear.

According to its 2010 Annual Report, the Meat Industry Association (MIA) is acutely aware of environmental impacts and the 'ethical' aspects of food production (MIA 2010:3-4, 37). To this end MIA was a sponsor and funder of the AgResearch study of the greenhouse gas footprint of exported lamb. This work developed a robust methodology for measuring the footprint of lamb across the supply chain, and highlighted actions being taken by the New Zealand meat industry to reduce the footprint:

The study has shown the industry has made great progress in reducing its emissions during the last 20 years, and that transport only accounts for a small percentage of emissions, effectively debunking the 'food miles' argument (MIA 2010:4).

According to the report, by producing more meat from less pasture, farmers have made a 20% reduction in the carbon footprint of New Zealand lamb during the last 20 years (MIA 2010:37). Greenhouse gas footprint studies of beef and other red meats are also underway.

Dairy

The dairy industry is very focused on environmental and sustainability issues including climate change. Dairy NZ regards climate change as a very real challenge with almost 10% of the milk solids levy being spent on climate change related research in 2009/10. Research topics include work on understanding the industry's carbon footprint, minimising nitrogen and ruminant methane emissions, and improving irrigation practices.

Fonterra¹⁸ also takes climate change seriously. It is a partner in the Pastoral Greenhouse Gas Research Consortium, is committed to reducing the intensity of emissions, is putting

¹⁷ Beef + Lamb New Zealand Ltd is the farmer owned industry organisation representing New Zealand's sheep and beef farmers with stock numbers above a minimum livestock threshold. Funding is raised by levy. Only one person per farm business may be registered as a 'Farmer' on behalf of the business. The numbers of votes of each 'Farmer' is in accordance with the numbers of livestock. (*Constitution of Beef + Lamb New Zealand Limited* Chapman Tripp no date)

¹⁸ Fonterra is a co-operatively owned dairy company owned by 10,537shareholders (New Zealand dairy farmers). It exports 95% of the dairy products processed in its factories to over 140 countries, and is the world's largest exporter of dairy products.

considerable resources into nitrate and methane inhibitors, and has developed a carbon footprint benchmark (from 2009). In 2002 Fonterra began a clean streams initiative to plant and fence waterways to keep stock from being bogged, and to keep the water clean. At that time whenever the technical officer took clean streams communications out to farmers:

she was met with outrage wherever she went. Now, it is an accepted part of our relationship with farmers. It has created an environment where every farmer in NZ [supplying Fonterra] has had to justify their efforts around key metrics every year. It has enabled us to engage with farmers on sustainability in a way that we were unable to in the past (Parsons 2011).

In addition, Fonterra is working to reduce the tail of farmers that are non-compliant in their effluent management. Starting in August 2010, 13 Sustainable Dairy Advisors have undertaken risk assessments on all 10,500 farms that supply to Fonterra. Two hour, one-on-one consultations were carried out with all 2845 referrals (15% of shareholders), and Effluent Improvement Plans have been put in place on at risk farms (12% of shareholders). Some 6% of shareholders have implemented their plans already. Fonterra says that the farmers they have been working with:

are now thinking about effluent from the perspective of the overall nutrient balance of their property, and they have had initial signals from Fonterra that we will be scrutinising nutrient use more closely in the future (Parsons 2011).

Fonterra and Dairy NZ together employ 25 people focused exclusively on effluent and nutrient management programmes as part of changes aimed at reducing dairy farming's environmental footprint.

FORESTRY

Forestry and local government entities support forestry/tree planting (labelled as Permanent Forest Sink Mechanisms) as opportunities to sequester carbon, as well as achieving benefits such as biodiversity, erosion control and improvements in water quality. This is seen as supporting improvements in the physical resilience of communities to the future impacts of climate change.

Like other commercial entities, while driven first and foremost by profits, forestry companies also have to pay attention to shareholder and customer concerns which include environmental issues. For example Oji Paper (which has wholly owned Pan Pac Forest Products Ltd since 2007) formulated an Environmental Charter in 1997 to operate in an environmentally sensitive manner including promoting global warming countermeasures. Pan Pac's own environmental guidelines meet the requirements of both the NZ Forest Accord and Principles for Commercial Plantation Forest Management to which it is signatory. The company has had Forest Stewardship Council Certification since 2001 for its forest management, sawmill and pulpmill.

Climate change issues which Pan Pac is currently confronting include stress on the timber from severe drought (although pine can cope with a wide variability in rainfall), large tracts of single age timber on steep land and wind damage to trees in an environment where more severe gales are anticipated in future. These all require careful management.

FARM FORESTRY

The Farm-Forestry Association has about 2000 members (mostly farmers) in 26 branches throughout New Zealand. Most members have only small forests, generally under 500 ha:

Many people don't plant trees because they lack the resources and the knowledge. There is very little taught about trees for land management in agricultural courses. You learn about the business of farming but not about the land, and the land is what provides the income. There is a big disconnect.

In the view of members of the Farm Forest Association, environmental protection, like nutrient caps, regulation of discharges into waterways, and water rationing, is going to be forced onto farmers whether they like it or not:

If a further 3 million ha of trees were planted this would buy 30 years more time to sort out the agricultural sector's contribution to greenhouse gases. Farm forestry is very useful in succession and estate planning, as cutting rights can be retained on the trees after sale of the land.

Action taken by landholders to protect their properties by planting trees before slip damage becomes irreparable is seen to assist in building the social resilience of farm communities by:

- providing a psychological boost through the feeling of doing something worthwhile with a positive outcome
- improving the look of the property
- building up the resilience of the property to adverse events and future impacts of climate change.

To people in the forestry sector, planting trees for carbon credits on parts of the farm where the property is susceptible to erosion is considered an obvious step to take. It is also considered that *'trees on farms add to the aesthetics of the property. This is different from wholesale forestry planting'*.

Farm leaders would like to see carbon credit recognition given to trees on farms where they have been planted along fence-lines, waterways, gullies, and to mitigate accelerated soil erosion.

LOCAL GOVERNMENT

Climate change issues are being 'mainstreamed' to a greater or lesser extent into policies, plans and strategies for development and management. For example, local authorities must take account of the:

- Coastal Policy Statement (including consideration of sea-level rise)
- Resource Management (Energy and Climate Change) Amendment Act 2004 which made explicit provisions for the effects of climate change
- Civil Defence and Emergency Management Act 2002 which requires regional and territorial authorities to plan for future natural hazards¹⁹

¹⁹ One of the key drivers of CDEM is the creation of resilient communities that are aware of hazards and understand the likely impacts of climate change.

- Section 7 of the Resource management Act (RMA) requires regional and territorial authorities to have particular regard to the effects of climate change when carrying out their functions (MfE 2008:17).

Local Government New Zealand is on the record for supporting an approach to climate change policy which alongside cost-effectiveness recognises: “*environmental, social and cultural well-beings and community resilience, as equally important drivers of climate change action*” (LGNZ 2007:4).

In 2008, a stocktake was prepared for Landcare Research of climate change projects and programmes being undertaken by community organisations, central and local government (Weaver 2008). This showed that of 644 climate change projects identified 48% were being carried out by local community organisations (and 52% by the government sector). The largest categories of project were action to mitigate climate change (18%), and ecological restoration (18%). A further 1% of projects focused on adaptation. At that time, many projects were still only in their inception or establishment stage.

Territorial authorities

There is variation in the way that territorial authorities are responding to, or leading, discussion on climate change. Some accept climate change as a reality, and are taking the best advice they can get on how to plan for likely outcomes. There have been national directives with regard to sea level rise and the likelihood of flooding, but this is usually only applied in new developments in ‘vulnerable areas’ and there isn’t full agreement on what constitutes a ‘vulnerable area’. There is also some questioning as to whether the predictions about sea level rise are too conservative (currently the figure being used is half a metre).

While there has been on-going dialogue between local government, central government and Ministers on hazard management, there isn’t the same widespread acceptance for taking a similar approach to climate change. There are tensions between territorial authorities and regional authorities on the correct criteria to use.

Most Councils’ thinking about the social and economic aspects of resilience seems to not yet be well developed. Local body staff tend to be aware of the issues and some are very well informed about climate change, but there is a wider range of attitudes among elected representatives. Councillors do not yet seem to be asking for analyses to be prepared on the social impacts of floods or droughts, or for guidance on social and institutional responses needed for community adaptation to climate change.

While the technical staff of some district councils are reviewing the issue of climate change, particularly in coastal areas where sea-level rise is recognised as a problem, policy staff are not yet being asked to view climate change as a major priority. On the other hand, water and water harvesting *is* a top priority. Councillors and staff are focusing on ‘physical resilience’ or, in other words, the ability of Council infrastructure to withstand shocks. For example: in planning for adverse events, questions focus on issues like “Are our stormwater systems adequate?” and “If we have a flood will our infrastructure survive?”

Another issue is the financial ability of some Councils to implement national level policies, particularly where communities have already identified their priorities through the extensive community consultation process undertaken in preparing Long Term Council Community

Plans. Councils are accountable to their rate paying communities and not government (except where bound by legislation) for decisions they make on behalf of their communities.

The capacity of some territorial authorities to manage the changes they foresee was a concern. Some councils cover very large geographic areas but have small populations and a small rating base. Consequently they employ small numbers of staff and are unable to provide the range of services that larger councils provide. Community resilience in these circumstances may be curbed by a lack of resources.

Central Hawkes Bay

According to the CHB District Plans compiled under the Resource Management Act (RMA) 1991, the main hazards for its communities are earthquakes and floods, followed by erosion (including coastal erosion), volcanic and geothermal activity, landslip, subsidence, sedimentation, wind, drought and fire, with potential for tsunami along the coast. CHB is part of the Hawke's Bay Civil Defence Emergency Management Group and has 25 emergency centres across the entire district, mostly based at the local schools, but also halls and local taverns. The Group's vision is: "A resilient Hawke's Bay community".

CHB's Long Term Council Community Plan (LTCCP) predicts greater frequency and intensity of storm events, but the Council has made no additional allowance for emergency work other than that funded from normal budgetary provisions (with the Council holding approximately \$1.2m in reserve funds for such events). It notes there may be a need for improved stormwater systems.

North Canterbury

Both North Canterbury District Councils' staff are keenly aware of climate change issues and these issues are acknowledged in council planning documents. The Hurunui District Council has documented expected changes such as an increased frequency of "*extreme weather events, and compounding factors such as rising sea levels*" as issues associated with climate change in its LTCCP for 2009-2019 (HDC 2009:62). The council comments that the 2008 floods caused considerable devastation and widespread damage to roads, fences, floodgates and tracks, particularly as the floods occurred after a major drought as a consequence of which farmers were struggling:

it is clear that we need to be prepared to respond to such events in order for farming and other key activities in the District to be economically and environmentally sustainable. In the recent incidents volunteers and Enhanced Task Force Green workers have helped restore farms and have lifted farmer morale, but ideal for the future will be to improve drainage so that the severity of future events is lessened (HDC 2009:62).

The hope for Hurunui, like CHB, is water – a new, larger irrigation scheme is seen as the solution to many problems and is an objective of Hurunui Council which states in its LTCCP under the heading 'Climate Change':

The subject of water is ...of major importance to the Council. Given the drought prone nature of the Hurunui, the Council believes the future prosperity of the district can only be assured with reliable sources of water to irrigate and support an increasing proportion of its 'food and fibre' producing farmland (HDC 2009:62).

Waimakariri District Council staff are currently preparing a Climate Change Policy for the Council. This document will recognise coastal hazards, will model rainfall changes, and identify work on, and plans for, managing flood events. Flood mitigation is an area that is seen to require more work. There is recognition that there is likely to be more rain and less snow, and a change in pattern of distribution (more rain in winter and less in spring and summer), and rain events are likely to be more severe.

Regional Councils

Climate change is an issue under serious consideration by the two regional councils in which the case study communities were located.

Hawkes Bay

In 2008, Hawke's Bay Regional Council (HBRC) developed a draft climate change goal to:

Build community resilience to climate change, reduce greenhouse gas emissions as far as reasonable practicable, and maximise climate change opportunities' (HBRC 2008:5).

While the Council does not indicate what 'building community resilience' entails, its proposed responses to climate change are considered throughout its *Ten Year Plan 2009-2019*. The Council states that a large number of the initiatives contained in this Plan are based on the latest (4th) Intergovernmental Panel for Climate Change (IPCC) scenarios:

Sustainable land management is even more critical under the extreme weather events and we are focusing on integrating social, economic and environmental outcomes at a catchment level. Forestry is recognised as being able to make a significant contribution towards sustainable land uses and climate change mitigation.

Investigating water harvesting opportunities will provide options for dealing with drier summers while, at the same time, capturing the excess water from more intense rainfall events. We are also exploring investment opportunities for solar and wind energy generation. At a corporate level, we are setting emission reduction goals for Council's activities and are looking at encouraging regional reduction initiatives.

The effects of climate change will impact directly on Council's resource and hazard management responsibilities especially on the region's water, rivers and coast. Council proposes to review current standards defined in the asset management plans and especially the risk threshold provided for within the flood protection schemes (HBRC 2009).

HBRC is seen by many farmers as leading the way on environmental matters with good strategies and policies. To many, this is one key to being resilient. The Council is working with clusters of farmers who are interested in making changes to become more resistant to drought. There are field days to discuss drought issues, a shift to planting drought resistant grasses, putting in more dams, fencing waterways, putting in stock shelter, and planting little slips with poplar and willow poles to prevent them from becoming larger slips.

HBRC has integrated climate change with its policies on land use change and water supply. A major project is proposed to provide fresh water to the Ruataniwha Basin west of Waipawa/Waipukurau.

Taking a broad brush approach to environmental and climate change issues, HBRC is also working on environmentally appropriate solutions to other issues. For example, considerable effort is going into disposing of waste water in an environmentally friendly way. Instead of taking an engineering solution to the issue, the Council has taken a biological approach and now discharges waste water which formerly went straight into the Tukituki river into wetlands and onto forestry land owned by the Council.

A joint central and regional government initiative aims to improve the resilience of hill country properties by improving land management, planting forests, and allowing land reversion and retirement. Six 'whole farm plans' have been developed in the North Island to encourage an integrated approach to improving the sustainability of the hill country in the face of more severe weather events. The approach includes wide spaced poplar and willow plantings enabling the continuation of pastoral farming on erosion affected slopes and the provision of an additional feed source for stock through pollarding of the trees.

Canterbury

Climate change is one of seven key challenges identified by Environment Canterbury (Ecan) in its LTCCP 2009-2019, and draft annual plan for 2011/12. Climate change is expected to lead to more volatile weather likely to result in increases in the frequency and severity of floods, storms and landslides (Ecan 2011a:24, 30) as well as biosecurity issues (Ecan 2011a:47).

Ecan has been a member of Communities for Climate Protection since 2004, and has commissioned modelling of climate change impacts for Canterbury (O'Donnell 2007). Projected climate change impacts include drier winters, warmer summers and more frequent or larger storm events, resulting in an increase in the frequency and severity of floods and droughts, and the cost of emergency management. The Council also notes that increased temperatures could also increase the region's susceptibility to new weeds and pests (Ecan 2009:4).

Hurunui and Waimakariri are part of the Canterbury Water Management Strategy – a major initiative which is taking a collaborative integrated management approach to the problem of significant pressure on the region's water resources²⁰. The new approach is a radical departure from the previous adversarial approach. With a plan and targets for the next 30 years, the strategy covers issues as diverse as ecosystem health, kaitiakitanga²¹, the natural character of braided rivers, drinking water, recreational use, irrigation, efficiency of water use, energy security, regional and national economies, and environmental limits. Comments from some of the people involved in this strategy provide insights into, and clarify aspects of, rural community resilience.

Environment Canterbury (Ecan) proposes to establish hydro power generation and a community irrigation scheme covering approximately 42,000ha in mid-west Hurunui (Upper Waipara and Hurunui river catchments). It has the support of 96% of the landowners and stakeholders. To improve flood protection Ecan began a major project in 2009 to, among other things, upgrade stopbanks on the Waimakariri River to improve flood capacity. The potential of a major water storage and irrigation project is currently under investigation in the Lees Valley.

²⁰ See Chapter 8, page 75 below

²¹ See glossary Appendix A

CASE STUDY COMMUNITIES' AWARENESS OF CLIMATE CHANGE

Further broad perspectives on climate change in the specific case study areas were gained through the one-to-one sector interviews.

FARMER PERSPECTIVES

For farmers, climate change is seen as not just a need for more water on the farm. It means significant land use changes that will introduce social and generational issues which will be expected to dramatically change farming communities. Already experience of dryland beef and lamb production shifting to intensive horticulture and dairying under irrigation has brought as much cultural change as environmental and economic change. For example, in North Canterbury:

Rural society is already changing: big is now much bigger than before [and] there has been a change in ownership and some cultural changes with new people coming in.

Several farmers commented to the effect that more intensive production brings more people, and more people means greater diversity, a need for tolerance, adaptation, and new perspectives.

Business as usual

Farmers do not necessarily make changes because they have a belief in climate change. It is part of their everyday farming regime to take actions that enable adaptation to recurring droughts. Many farmers see change as happening anyway, and say that they are making changes in response to volatile weather patterns rather than not long term climate patterns.

Farmers' primary goal is to look after their stock in the best way possible. In responding to the droughts and with less feed available they have reduced stock, made subtle changes in their management, and used less fertiliser²².

Some farmers see no point in making changes when they don't really know what to expect. Fifty years is seen as a very long time, and is not seen as influencing what they do now in terms of their management. Five to twenty years is a more realistic period, and over this time frame they expect more erratic distribution of rainfall, long dry periods and big dumps of rain. Under this regime they expect to farm more conservatively and carry less stock:

With fewer ewes you get better quality, larger lambs and this is what gets the good prices – not numbers, but size. The market rewards bigger, quality stock.

Farmers are continuing to breed improvements and are taking up the technology that enables quality improvements. Change is incremental, season by season.

The perceived wisdom of many farmers is that there are long running, approximately 30 year, cycles of weather/climate oscillations from cooling to warming. Few farmers talk about 'climate change'. They talk about 'weather bombs' or 'adverse events'. For example, at the storm damage meeting held 11 May 2011 in Waipukurau following the April flooding and landslips in

²² With the improved season and prices in 2011 fertiliser sales are up as more fertiliser is applied.

coastal Hawke's Bay, speakers reflected that "*this kind of weather bomb is just a normal expected experience in some parts of the North Island hill country every year*"²³.

Focus on water

Irrespective of views on climate change, people interviewed from both North and South Island case study farming communities, and also people from leadership positions in the agricultural industry, forestry industry and local government sectors are concerned about the availability of water, as this is already a constraint on farming. Where there is water storage, farming areas have potential for population growth and community rejuvenation – with all the benefits that go with community growth, such as strong schools and other services.

Davison (2006) emphasised the anxiety and trauma created by drought in his thesis on the social, environmental and economic impact of irrigation in the Amuri basin of Hurunui. Droughts have plagued the Hurunui as they have CHB. Both areas have an ongoing need for additional water storage and irrigation, and this is recognised by both Regional Councils. Likewise the proposed Lees Valley scheme is seen as being essential for irrigation expansion in Waimakariri District.

Emissions Trading Scheme (ETS)

There is concern that the ETS is shifting finance from productive investments to non-productive investments. Farmers' comments include the following:

Imposing excessive costs on farmers [the ETS] will create an excessive burden for an industry which carries the economy ("killing the goose that lays the golden egg"). The issues we don't hear about include bio-security, TB, rabbits, wilding pines, Canadian geese, and introduced trout. In New Zealand environmental enhancement is undertaken by farmers for free, in Germany farmers are paid to do it.

We are in it [the ETS] because we have to be seen to be doing "something" about climate change, and, no-one can think of anything better at the moment so this will do. In terms of getting forestry planting increased it has been a resounding failure because no-one has any confidence in what their future liabilities are going to be so it is not possible to make an informed business decision.

The ETS has no impact on the climate change issue, just further undermines the red meat industry. It will destroy our profits and our resilience. There is a significant tax advantage to plant trees – whereas the livestock industry is not subsidised in any way.

The real problem is the numerous volcanoes around the world spewing greenhouse gases into the atmosphere. Anything we do is a drop in the ocean. Having said that there are a lot of things we can do in New Zealand to future proof ourselves from any effects of human pollution of the planet.

Farm suppliers/consultants/and fertiliser industry representatives' views on the ETS were:

New Zealand should not impose a cost on its farming sector unless the majority of our major competitors globally are prepared to follow suit. If we are the only country that

²³ It is not clear to what extent this is an accurate observation or if it is a denial of climate change or whether it is denial of the magnitude of the issue – i.e. the feeling that to survive requires a step by step approach to be manageable. The big picture may be just too intimidating.

prices agricultural emissions, this will erode our competitiveness and we'll lose market share.

INDUSTRY AND BUSINESS SECTOR

Farm consultants/Rural support

Irrespective of the cause of the adverse events being experienced, we were told by people from this sector that farmers are adapting and continuing to adapt as part of their normal management. Some farmers are trialling new pastures that research suggests are environmentally 'friendly'. The recent droughts have focused attention on the need to be proactive.

Economic viability is the most critical driving force and the key to the resilience of farm businesses and farm families. Sheep farmers' response to adverse events is to stop spending. Dairy farmers know on a daily basis what they are earning – but sheep farmers don't have this certainty. The townspeople know this – dairy farmers spend when they are doing well, sheep farmers are much more conservative.

In both Hawke's Bay and Canterbury it is considered that some of the farmers running businesses on properties that have been in their families for generations are ignoring warning signals that they are insolvent and need to get out of farming.

Some farmers are unable to make decisions about the changes they need to make. We can sit around the table for three hours, but they just don't get it. They are way outside their comfort zone. They don't have sufficient shade on their property to protect stock, they are losing soil to the neighbouring farm, but they can't see the need to do anything differently. Admittedly these are in the lowest quartile.

Mostly farmers have to see what other farmers are doing successfully to recognise there is a need to change their own farm practices. Several farmers in this district have had Farmers Fund money and this has worked. The Regional Council pays for seeds and the tractor, the farmer pays for the labour. If you do a few hectares at a time then it doesn't matter if it doesn't work.

Fertiliser co-operatives

The fertiliser co-operatives are very aware of environmental issues and the need to reduce greenhouse gases. We were told that placement of fertiliser is now carefully controlled and every paddock is soil tested. Dairying is leading the way in the development of nutrient management plans and the use of nitrification inhibitors (to reduce nitrous oxide emissions and nitrate leaching – that is, nitrous oxide (N₂O) emissions from urine patches on pasture during winter). Scientists from AgResearch, Landcare, Lincoln University, and NIWA are involved in this research with funding coming from MAF, Fonterra, DairyNZ, the fertiliser industry and the Pastoral Greenhouse Gas Research Consortium.

Fert Research²⁴ is involved in climate science research. Their annual update notes that "Individual farmers are progressively moving away from traditional fertiliser types such as

²⁴ Fert Research, in operation for over 60 years, is currently funded by fertiliser co-operatives Ravensdown and Ballance Agri-Nutrients.

superphosphate to using blends and combinations to suit their specific farm's needs (based on soil type, terrain, climate, fertility targets and production goals" (Fert Research 2011:2).

Farm suppliers

Neither Farmlands nor CRT²⁵ mention climate change in their annual reports although CRT recognises 'climate volatility, and Farmlands, like other farm suppliers, is very conscious of the impact of adverse events on its clients. These companies help out every way they can, from deferred payments and discounting through to staff actually helping out on farms and around the district following an adverse event. On the other hand farm suppliers are dealing with the here and now, not future proofing:

People are only aware of what they need to do when they have an adverse event. For example after the last floods we've had a lot of orders for poplar poles and trees, but farmers should have been planning and planting well before this.

According to its website PGG Wrightson's view is that 'good environmental practice is at the heart of our business'. The company has a quadruple bottom line reporting focus that recognises social responsibility and balances environmental, social, cultural and economic sustainability issues, including assisting with regional drought management programmes and supporting community activities. For example, following the April 2011 flooding and slips in Hawke's Bay, PGG Wrightson offered seed for re-grassing and fencing materials at cost. It regularly provides feed budgeting advice for drought situations and staff help with snow racking and other activities during events in Canterbury. PGG Wrightson is a foundation member of the Pastoral Greenhouse Gas Research Consortium.

Other rural businesses

It is not just farmers who are interested in maintaining water storage and peak river flows. Some rural tourism businesses want to know that there will be sufficient water in the rivers to continue to attract recreational users. Their requirements are not driven by nostalgia but hard economics. In this respect, water quality is just as important as quantity.

MĀORI PERSPECTIVES

Maori expect further environmental, economic and societal changes with climate change. The Resource Management Act (RMA) has had a big impact on Māori due to the amount of voluntary effort they have to put into to scrutinising and commenting on resource consents and other documents. They see this as likely to escalate, and feel there is little understanding of the value of this work by the community as a whole.

PERSONAL VIEWS ON CLIMATE CHANGE

As noted previously, the focus group discussion and the one-to-one community interviews concentrated on issues of community resilience in general rather than climate change *per se*. Nevertheless many participants did offer views on climate change. It might be expected, given

²⁵ CRT is a South Island farmers co-operative supplying inputs to farmers from farm supplies to fertiliser, livestock, seed, fuel, finance, real estate services, and so on. Farmlands is a co-operative supplier in the North Island selling chemicals, apparel, fertiliser, seed, fencing, hay and silage products and water management materials (tanks, valves), etc. PGG Wrightson sells *inter alia* rural supplies, finance, insurance, livestock, real estate, livestock, seeds, wool, a payroll bureau service, and agriculture consulting and training, across New Zealand.

the consistently high levels of sector awareness and understanding of climate change issues, that such understandings would also be widespread in the community. Not so. A range of views emerged from those consulted. Some people thought that the changes being experienced today are no different from changes experienced throughout history and that such changes will keep recurring.

Some people felt that many global disasters are due to a burgeoning world population growth. With many more people now living in places which have always been susceptible to flooding, tornadoes, accelerated soil erosion, fire, water shortages, and so on, there are obviously more people being affected by such events. The greater facility for instant global media attention also means that these events get wide media coverage.

There was a view that some people do not realise that climate change is an issue:

People don't understand that a 2^o Celsius increase in temperature is not benign, it's a huge change.

People are not getting the message. There is so much nay saying and counter argument that people don't know if climate change is a reality, what it means, and more to the point how it will affect them, or the country.

When climate change was couched in terms of hazard management there was considerable interest and discussion about preparations that could be made. Hazard management links with infrastructure maintenance – a concern for both rural people and local authorities. In this respect, most people interviewed felt that we will continue to experience events for which preparations need to be made, and for which (to some extent) they are preparing.

Some of the broader issues of climate change were recognised. Future water shortages are of concern and people had different ideas about how these could be addressed. While some see engineering solutions (water storage dams) others see that different ways of utilising water will enable water savings to be made across the community. Some people also commented that they are already seeing changes in 'bio-control systems' and noted that new weeds and pests are being found. While some farm people recognised that this may mean changing farm management systems, non-farm people did not necessarily recognise that they too have a role in working to control the spread of pests and weeds, and they too can make changes that will save water.

Others see major change coming. Many of the people interviewed had the view that in addition to long term episodic and variable weather patterns, the climate *is* changing, and that this is bringing subtle changes as well as more dramatic events. This means all kinds of adjustments, adaptation and where possible mitigation. The reaction of these people is that the way things were done in the past needs reviewing, and 'business as usual' is not an adequate response.

Comment

Awareness and acceptance of climate change is mixed. The need to prepare for adverse events is more easily understood and grappled with than the more nebulous need to plan for climate change impacts that are not fully comprehended.

When rural people (whether farmers or non-farmers) identified and discussed their individual and community experiences of past changes, current events and future expectations of change, although climate-related experiences were covered, social-related events were given more weight and appeared to be more problematic for the community. This is possibly

because of the greater immediacy of social issues compared to more distant likely impacts of climate change. It is also possibly due to the limited control the community felt it has over social change and/or the negative feeling of an erosion of community identity and solidarity. Perhaps because they are used to dealing with weather related events they did not consider these as particularly 'big deal'. People had a "*we deal with it*" attitude. That is, people felt empowered by their ability to do something practical in the face of events such as floods: "*we all help each other*" and this was experienced as community-building and positive.

Social networks rather than agencies seem to be the catalyst for achieving preparation and awareness of climate change within the farming and business community. 'Disaster-related' conversations are primarily carried out in informal social situations: 'over a beer' and within social and/or work settings.

We noted that people tended to talk about climate-related adverse experiences as isolated 'events' (i.e. events that any farmer would expect to have to deal with), without connecting such events to a wider pattern or trends. While this may be a natural consequence of the way we framed our discussion, 'events' focused language was also noticeable at the 11 May 2011 storm damage meeting in Waipukurau (perhaps unsurprisingly as this was an 'event' related meeting). It is possible that the use of 'event' focused terminology in official contexts (such as the name 'Hawke's Bay Producers Adverse Events Trust', and government graded levels of event adversity) encourages that framework, and may also encourage short term (disaster event) planning at the expense of long-term climate change planning.

The way in which information on climate change is framed, and the language that is used in climate change discussions, seems to be an important factor in 'driving' people towards either ends of the spectrum of, on the one hand, recognising and doing things to mitigate climate change, versus on the other, 'business as usual is OK' attitude:

People need clear unambiguous messages and information. But forcing it down their throats at meetings is a switch off. Better to focus on what's meaningful – like 'coping with drought'.

There also seems to be another group (possibly a large one) who sit somewhere in between the two perspectives – those who accept the validity of climate change on some level (possibly on a basis of low information) but are resistant for a number of reasons to proactively make the behavioural changes needed to reduce the future impacts of climate change.

The above discussion points to an overall picture of confusion about climate change at the community level, with a wide disparity between the seriousness with which central and regional government policy-makers are taking climate change, and the obliviousness of many community members both to the issue of climate change, and how best to respond to it.

7. PERSPECTIVES ON RESILIENCE

The first area of discussion in the interviews and focus group meetings concerned the term 'resilience' and what that meant to people, and what they thought the characteristics and attributes of resilient communities are. The focus groups came up with similar ideas about what resilience meant as the people who were interviewed individually. These ideas included:

- *enduring, having staying power, being tenacious, having 'stickability'*
- *adaptable, flexible, adapting to change and opportunities*
- *being able to bounce back*
- *absorbing life and thriving*
- *strong, robust*
- *stoic*
- *self-sufficient*
- *resourceful*
- *staying in the community and on your land despite circumstances*
- *people having a sense of belonging, ownership and pride in their community, and actively participating in community affairs and activities*
- *being able to tough it out when everything is going wrong, such as when there is no money coming in, and floods or drought hits*
- *being open to change and diversity (tolerant and accepting difference), and coping with change at individual, family and community levels*
- *when something happens we pick ourselves up and move on.... we pull together as a community when there is a crisis*
- *having confidence and self belief in your own, and your community's ability to cope*
- *having a vision that provides motivation and a goal to work towards*
- *recovering quickly and bouncing back after a crisis. It's that 'can do' attitude.*

Comment

The above 'definitions' align with those identified in the literature, and particularly with aspects of social resilience. Notably, people in the case study areas expressed their ideas about the meaning of resilience in a personal way. They connected with an assumption of, and pride in, their own and/or their communities' resilience.

CHARACTERISTICS OF RESILIENT COMMUNITIES / BARRIERS TO RESILIENCE

People interviewed for this project thought carefully about what a resilient community meant to them. While aware that the focus of the study was *rural communities' resilience to climate change* respondents from both Central Hawke's Bay and North Canterbury did not want to limit their response to climate change or even environmental contexts, and nor were they encouraged to. Instead they delved deeper and talked in a holistic way about the changes that were taking place in rural New Zealand, about different ways of doing things, the need for more integrated thinking, and not least, what it was about their community that really mattered to them.

Often people conveyed their views on resilience through the negative – that is, by describing difficulties and vulnerabilities caused by the absence of a particular characteristic. In addition, some of the positives for resilience were sometimes also seen to come with negative aspects,

or were seen as a barrier to resilience by a different person or group. For this reason, feedback about barriers is presented along with the feedback on positive features.

STRONG AND VIABLE ECONOMIC BASE

Many people talked about resilience as being about the economic viability of their business. Some focused on personal economic resilience:

You can't be resilient if your business is failing and you aren't making any money.

To be resilient you have to be making enough money to feed the kids and pay off the mortgage.

If you are in debt and a good farmer you've got a better chance of struggling through – especially this year (good season, good prices).

If you aren't profitable you haven't got the options to sort out and tackle the issues around the environment, or social, cultural and economic issues.

Rates for rural roading were seen as an important economic issue in the context of resilience. We were often told that with improved roads, distance is no longer the tyranny it once was – but that there is an issue about who pays for roading maintenance. The cost of roading is climbing and farming leaders say farmer ratepayers are shouldering more than their share of the burden given the importance of rural roads to the national economy:

Farmers are paying more than their share. All that we farmers produce (and farm inputs) are carried by road. We pay road user charges for this.

Farmers' ability to deal with adverse events comes down to financial viability, and the same applies at the community level (the rating base has to be large enough to cope with infrastructure development and other measures).

On a wider scale, there were concerns about the economic vulnerability of some communities.

Changes in the agriculture sector have already brought major changes to rural Māori communities. Discussion with Te Taiwhenua ō Tamatea elicited comments reflecting the impact of declining sheep numbers on employment. We were told that until the mid-to-late eighties everyone was in work:

Six shearing gangs worked this area, plus another three in the busy season, and there was year round work and income for women and men. There was a community approach to working in the sheds. Everyone pitched in. There were enough shepherds to form a rugby team. We were all in work then. We were paid in advance for the shearing and there was free meat, power, milk and accommodation. Even when farmers weren't much good at farming they made money in those days due to Supplementary Minimum Prices. When subsidies were removed everything changed. There is only one shearing gang now, and it does day trips and works 9am to 5pm (instead of 5am to 5pm) as the roads and vehicles have improved, and the work isn't there anymore. Sheep numbers are way down. To get a job now you have to have the qualifications. For example, you may be a good speaker of Te Reo, but you don't get the [teaching] job without the piece of paper.

Despite these difficulties the general feeling was that the people of this taiwhenua are resilient and have the structures and value systems which enable them to pull together and carry on as a community.

Some locals considered that resilience of their community depends on the continuance of key businesses. In CHB this included firms such as the Silver Fern Farms freezing works in Takapau (*a stable, large employer*) and the Mr Apple packhouse in Waipawa. Closure of the Ovation plant in Waipukurau with around 300 job losses in June 2011 was said to have cut \$6 million worth of spending from the local economy²⁶.

In contrast, In North Canterbury a diverse economic base was seen as contributing to rural community resilience:

The mix of dairy/sheep farms and tourism is good for the district as it helps keep things going if one sector is down.

Marketing structures were also an economic issue. Dairying was seen to offer more resilience than sheep/beef production because it is robustly connected to the market:

By trading through a single desk seller farmers are working together rather than undercutting each other as happens in the sheep/beef industry. Sheep/beef production has major problems because of the myriad of traders and brokers and other middle people who take a percentage of the returns.

Against this, the high cost of dairy conversions and high level of indebtedness that can come with the fixed costs of operating a dairy unit means that dairying can also be vulnerable during periods of low returns. Those with a diverse range of income streams appear to be the most resilient.

Economic vulnerability was also talked about in terms of the levels of farmer expectations and borrowing in the current economic climate. We were told by several people from the financial/property/business sector that a fairly long tail of farmers is in denial about their economic viability. After four years of drought, a global financial crisis, and changes in banking rules (that is, less liberal lending policies), some farmers' expectations about their standard of living were considered unrealistic:

The farm business itself has to be viable. Farmers can't just borrow against the value of the land. Their borrowing is now against the returns they are getting from the land. Banks aren't prepared to fund losses any more.

Banks don't treat farmers with the same degree of flexibility they used to.

They [the farmers] need to change the way they think, and do things differently. While the farms they are on were big enough for their parents to be able to afford their boarding school fees, they are not big enough to pay for their children's fees.

The world is a very different place now. Where once farmers could make up their losses through inflationary land values they don't have this option now. Children may not be able to afford to buy out their parents... While product prices this season are very good, this is

²⁶ <http://tvnz.co.nz/national-news/community-prepares-major-job-loss-shock-4275154> (accessed 29 June 2011).

on the back of major bank debts, reduced fertiliser, deferred maintenance and postponing the kitchen makeover.

Comment

There appeared to be some differing focuses between principles of community economic stability being offered through maintaining the presence of a single large employer in the community districts, and the principle of economic diversification. Business diversification was seen by all as a good thing in providing a stable economic infrastructure. However, communities which historically had been built around a single industry and had assumed the ongoing existence of that industry appeared to be more vulnerable to economic and political change, and less likely to have available the resources and opportunities to diversify. Other communities were further down the track of change and already seeing the benefits of diversification.

The high level of vulnerability of the smaller rural communities to external economic change and political policy changes is to be expected in a small country like New Zealand. The implication is that such economic vulnerability reduces individuals feeling that they can influence what happens in their community, and thus reduces resilience. This fits with Paton's identification of community empowerment as a domain of community resilience²⁷.

People were adamant that it was not so much climatic issues and risks that threatened their resilience, but social issues. There also appears to be a belief that although economic viability is necessary for survival, resilience is much more than this.

STABLE SUCCESSION STRUCTURES

Concern was expressed about the changing demographics of the rural communities, in particular the impact of aging on community resilience. Agricultural leaders were concerned that the average age of sheep farmers has increased, with 'baby boomer' farmers now in their fifties and sixties, but unwilling or unable for financial reasons to move aside for the next generation. This was regarded as a barrier to resilience if it leads to less innovation.

While farm properties have been changing hands over the past 15 years, there are still farmers going strong in their late 70s and 80s. Profits haven't been strong enough for the parents to get out of the business and leave the younger generation to it (i.e. the younger generation can't afford to buy out their parents). Fortunately attitudes have changed enough that the generations get on.

Many of the current farmers have been away to university and worked outside in corporate jobs and/or on different farms around the country before coming back to a family farm. Not all of them come back – they can get high paying jobs elsewhere.

The average age of dairy farmers is early 40s - a decade younger, because 'dairy farmers have a career pathway to follow'.

Dairying has a good succession process and younger people are coming in, but sheep farming doesn't [have a succession process]. In the dairy industry wealth is shared, but not in the sheep/beef industry. Share farming is rare [in sheep/beef production]. You have

²⁷See Chapter 4, page 23 above and Vol 2 Background Paper VI pp75-78

equity ownership in dairying. In sheep/beef you can't work on a property then buy into it. If you have three or four kids you can't treat them all the same.

Not just the farmers are aging. The average age of the men working in rural industries is also seen as increasing;

It's hard to find replacement [truck] drivers. The young ones are not coming to work in rural areas.

Comment

Succession is not clear cut. Challenges such as a shift in the skill base and interests of the next generation both female and male, and the ownership structure of the land and the business and its financial viability, may constrain options. Individual family and business decisions when multiplied across the farm community as a whole are likely to introduce major social changes. Children are seen to have more options now and this is regarded as 'a good thing'. Having good succession plans is, for some, part of being resilient.

As shown by the population pyramids²⁸, young adults tend to move out of the area once they have completed secondary school. The students told us that if they return, it's likely to be in a different role (e.g. farmers' children may return to take up a non-farm business or as small-holders rather than buy a whole farm property). Young people see their own futures as lying outside the area. They see their peer group as a mobile community which they can take with them when they leave their home community. Technology changes have contributed hugely to their ability to do this.

Where farm families have cashed up and left, the remaining businesses that have acquired these properties are bigger and stronger and doing well. Equity is mostly still very good in the sheep/beef sector (although this may be related to the age of the owners, and length of time they have owned the land).

In the sheep/beef sector technology has enabled one person to handle 2-3 times the stock units that the previous generation dealt with, so there are fewer job opportunities. Farming is seen as more interesting than before, with rewards for doing things well. However: "*the third quartile of farmers can be encouraged to lift their game to the level of the second quartile, but it is unlikely that the bottom quartile will improve much*".

Concern over the perceived aging of pastoral farmers may be more an assumption than a reality. It may not take account of a more generally healthy population, or the tendency for inter-generational property and business ownership. A multi-generational structure allows the older generation to remain in the business for longer. It is also possible that the district is on the cusp of 'generational turnover'²⁹.

STRONG SERVICE INFRASTRUCTURE

Communities were said to be resilient when they have a good range of services and when these services are closely connected to the community.

²⁸ See Vol 2, Background Paper V pp46, 52, 58.

²⁹ This occurs when, influenced by New Zealand's double-peak baby-boom and following baby blip demographic structure, many families in a district are at the same life-cycle stage (it also affects school rolls).

Resilience comes from having excellent quality services that are interconnected with each other. This enables people to work together as a community in a crisis.

The key essential services identified include local schooling, broadband, clean drinking water, certainty of continuous power supply, health and social services, roading and services for youth and the elderly.

A resilient community is one that is able to provide for the basic needs for the community, such as electricity, telecommunications, schooling, a fuel and supply store, health assistance of some kind, road access, emergency services of some kind and social opportunities for all age groups. It is one that stands up for itself, celebrates successes, and provides support in difficult times. It also offers opportunities, and can maintain or grow its population.

The loss of such services in some areas (in particular school closures) were felt to contribute to loss of resilience in the community:

Communities have died when their school closed.

There is still inequality in service access for people without transport or whose hours of work make it difficult for them to access health services (such as shearers) so must travel to Hastings to the afterhours clinic there³⁰.

Young people were unanimous in feeling the constraints of choice (e.g. lack of services and activities) in their community³¹.

There was a level of resignation with regard to changes in community service infrastructure, as well as acknowledgement of some positive benefits coming from such changes:

Rural people are nostalgic at the closings [of rural services and businesses] but you have to recognise that things change and you have to be flexible.

In the past the local community provided everything – shops, schooling, entertainment etc – however with improved roads more people have settled in the area, and a lot are commuting [to Christchurch and Rangiora from Waimakariri and the southern end of Hurunui, and to Hastings and Napier from CHB].

Commuting is not just in one direction. People from the cities are driving to rural centres for work and to shop:

Improved roads mean that the reach of the urban sector has penetrated more into rural areas. Not only are rural people shopping and working in urban settlements, but urban people are coming to the country. Oxford is booming – you can't get a park in the weekend with city commuters patronising the restaurants and cafés, shopping in the book shop, gift shops, and art gallery.

The retail sector in the study communities is experiencing the same changes being felt elsewhere. In Waipukurau, for example:

³⁰ Not everyone is eligible to use the transport provided by the Red Cross to attend Hawke's Bay District Health Board appointments in Hastings and Napier.

³¹ See Chapter 8, pages 76-77 'community initiatives' below for examples of how the Oxford Community is dealing with this issue.

The retail sector has changed considerably – there’s been a shift into supermarkets which has taken over from the small specialist shops. This means that accountants and lawyers have moved into the main street, when before they were in the side streets. The retailers are older too. Only hairdressers are young. The pharmacy is a dispensing chemist and needs qualified staff, but it is hard to attract trained staff to rural areas.

Some small Councils (those with fewer than 50 to 60 staff) are seen as being not sustainable and may not have the resources to provide the range of services needed or desired. Shared services is one way Councils have addressed this issue – but this tends to be for services that the council itself needs in order to function, rather than services for the public. There was some concern about staff coming from outside the district:

Many staff travel from elsewhere to work for the council, so may not have the same degree of vested interest in service provision and improving quality. They may not have knowledge of, and connections with, the local service providers, particularly not-for-profit providers of social services that are needed in preparing for, responding and recovering from adverse events.

Access to technology was probably the most frequently cited of the essential service infrastructure factors for resilience.

Computers were seen as an essential tool for families, businesses and for farming – whether for fertiliser application (soil type, amount to apply, and GPS assisted locationing), genetic testing, processing and marketing, or for social connections. However, there is a need for adequate functioning broadband for computers to run effectively. There was some anger, particularly in Hawkes Bay, that the new broadband rollout is “*using outdated technology – it’s a cheapskate option*” and delays in the introduction of fast broadband are seen as a significant barrier to resilience³².

Broadband is absolutely essential to improve communication.

Broadband is the key to survival not just to being resilient. People want information packaged the right way. We get so many documents you need fast data transfer.

New communication technology enables people to connect in a different way to before. Everything is done by email now, so you don’t necessarily connect with your neighbours, you are connecting with people with similar interests and they probably don’t come from your local community.

The availability of fibre optic cable and improved digital bandwidth (speedier data transfer) is seen as providing major opportunities for farmers as a tool for dealing with climate change.

With probes set across paddocks, farmers can programme their home computer to check soil moisture and switch the irrigation on and off as needed.

Older people still use the web, younger people social media. Either way farmers need to be receiving messages on the latest technology that is meaningful to what they are

³² Hawkes Bay is one of four North Island regions where highly remote areas and rural areas with low urban influence have rates of accessibility to the internet that were well below the national average in 2006. This is problematic. “*As the internet is becoming one of the principal channels for undertaking business and gaining information, low access rates will have a tangible impact on the ability of households to interact with the wider community*” (MAF personal comm.).

doing, and their particular topography, soils and weather patterns. One key issue is still coverage. Cell phone coverage across rural New Zealand is abysmal. Satellite and wireless (digital) communication are very weather dependent. Fibre-optic cabling is more reliable.

Comment

Factors of service infrastructure clearly increase outcome expectations (of positive outcomes in terms of dealing with adverse events), and of increased community networking (through communication technology). These align clearly with Paton's community resilience domains of outcome expectations for community resilience and community participation respectively.

INTEGRATED APPROACHES TO CHALLENGES AND CONSENSUS DECISION-MAKING

How people approach the challenges they face and how they deal with each other in working through issues, surfaced as significant facets of resilience in this study. Unsurprisingly, therefore, the need to consider the multiple views of all stakeholders and gain a consensus when approaching challenges was a theme that emerged many times during interviews and the focus group discussions;

You get community resilience when you have an environment where all the issues can be discussed.

Communities become resilient when the beliefs of all stakeholders are being thoroughly canvassed and understood, and issues are debated from the perspective of the environment, the economy, society and cultural considerations.

Communities that take time to reach a consensus, and also take an integrated approach to decision making (that is, consider a multiplicity of issues simultaneously), were seen as being resilient. People felt that communities where this kind of approach and thinking is the norm will have the strength and the tools (capability and resources) to cope through adversity and not only bounce back but will be in an even better position than before:

Farmers are many things and can't be stereotyped. They are foresters, they are involved in recreational activities, and they often have other business or career interests alongside farming. When farmers join together to work in a co-operative way they strengthen their position. The dairy industry has proved this with a single seller marketing approach.

An example of an integrated approach cited by a North Canterbury interviewee is aggregated consent entities (ACE). In these entities 100 farm businesses may operate under one consent for water. This enables farm families to reduce costs, have greater control over the environment: and act as a 'bloc' to compete against large corporate entities:

There are significant social and economic implications for farmer organisations when they represent multiple farm families of several thousand people, all with common economic interests and similar environmental perspectives. Such a collaborative ethos is a strong 'strategic defence' against sceptics, enabling whole communities to influence how we approach climate change as a nation and also how we influence our international trading partners.

The principle of community-centred formal processes for decision-making was seen as critical in coping with change and achieving resilience.

Complex issues that are dealt with individually are not managed effectively. The most effective approach is an integrated one that considers social, economic, environmental and cultural factors simultaneously to achieve the best outcome. Traditional Māori approaches to issue resolution seek this holistic path and also aim for consensus.

Because the New Zealand Court system uses an adversarial approach, issues that are tackled in Court under the Resource Management Act were seen as confrontational, creating situations where no-one wins:

In court there can be misunderstanding of the point you are trying to get across and no opportunity or process to clarify meaning.

This [the adversarial approach] leads to entrenched positions and bitterness that divides the community as the various factions compete with one another. Patch protection and brokering of deals may ultimately result in a lose-lose situation for the community.

People found it very helpful to hear from local technical experts who “*really know their subject in the New Zealand context*”. Where discussion on issues is approached in an investigative way, it is easier to identify solutions than when an adversarial approach is used.

People interviewed talked about the value and importance of genuine consultation, and of achieving consensus and that this was an entirely new way of working for many of them. In this respect the consensus approach involving a full range of stakeholders adopted in Canterbury’s water management project was seen as a breakthrough.

Comment

Decision-making based on full consultation and investigation (rather than confrontation) and consensus agreement is clearly experienced as empowering by the communities. This resilience factor is in agreement with Paton’s factor of empowerment – ‘the ability of individuals to influence what happens in their community’. However, integrated thinking and consensus decision-making requires individuals to operate as a group: that is, through collective rather than individual empowerment. Such an emphasis may well be linked to the strong influence of Māori collective cultural principles in New Zealand society.

HIGH LEVEL OF PREPAREDNESS AND PLANNING FOR ADVERSE EVENTS

Strategic planning

Feedback showed clearly that when rural people think about future events, planning is part of the agenda. While there was resistance to ‘top down’ planning, people variously talked about increasing and extending community networks to be resilient and about planning at the family level. School students talked about the need for certainty in town emergency planning, community representatives talked about wanting joint planning, the Regional Council talked about long-term planning, and Te Taiwhenua ō Tamatea talked about strategic planning. All this implies some form of positive expectations about planning and taking action in advance. While as noted above few farmers think 50 years in advance, many farmers do have fairly long term plans:

Rural people think 20 years in advance. We have development plans that go forward 10-15 years. Even re-grassing is planned five years ahead. Many town people live from payday to payday. We can’t do that. We always have enough food to be able to cope if

we're cut off for a week or two. We put in a 20,000 litre water tank and have two wheelie bins with spare blankets and water, plus torches, radio and so on.

In CHB, some of the people we spoke to individually, and all groups, voiced the need for the wider community to work more closely together. By this was meant the planners, the leaders, and grassroots including hapū. Different sections of the community, particularly those who will be affected by decisions, need to be involved in discussions from the very start. There seemed to be a desire and willingness to take action to network and plan.

Regional Council staff and Te Taiwhenua ō Tamatea both indicated they want to reach out to the wider community and had been working towards this for some time. However, some people considered there was a gap between people knowing what they want to do, and being able to actually do it, with community groups at different stages of readiness for networking and planning.

There was some thought that given the short electoral cycle, councillors do not always learn fast enough to grasp the complexity of the issues they are confronting. Support from experts and good facilitation is seen as necessary for enabling councillors to make decisions in a different way.

While there was strong feeling from respondents from both study areas of the need for decisions to be made locally for local issues, there was concern about the financial ability of the smaller local authorities to adequately analyse and manage very complex issues.

Planning

Planning for the management of adverse events is a strong feature of the work of institutions and agencies, who are working hard to provide advice that will be of value to their clients and in an acceptable format. Beef + Lamb New Zealand, the industry body which represents sheep/beef producers, has a webpage devoted to comprehensive information for farmers on planning and coping with snow events, floods, landslips and other adverse events. It also provides links to the Rural Support Trusts. DairyNZ has a comprehensive booklet and checklist for planning and dealing with floods, and provides comprehensive web-based advice and guidance for planning and dealing with power cuts, snow, storms, earthquakes, stressed stock, stressed people and every other imaginable crisis. Farm-focused corporates like PGG Wrightson also provide information on how to plan for and deal with adverse events.

Rural Support Trusts provide a free (taxpayer funded) service to farmers to assist them work through adverse event issues. Adverse events are as diverse as floods, drought, snowstorms, financial, animal welfare, and personal crises. The Trusts are in a good position to assist the movement of stock, activate emergency equipment and resources as they are linked into local civil defence networks. Trust personnel act as mentors and advocates, facilitate farmer access to financial support, farm management advice, and labour, and are sometimes just a person to talk through issues and plans with.

Feedback from the interviews identified that a critical element of planning is access to full information. One barrier identified by agencies was the difficulty they had of finding effective ways to communicate and ensure the community was accessing climate change information. The task of persuading people to engage with new ideas and ways to make needed changes was equally difficult. Even getting participation in farmer field days was a challenge (although the high farmer attendance at the local storm damage meeting in Waipukurau following the

coastal floods was described as making headway). Particular resentment was expressed at 'bureaucrats':

We don't need people who don't know what they're talking about telling us what to do.

Such feelings strongly link with the desire for community-centred decision-making – a resilience factor noted above³³.

Risk mitigation: preparation for, and recovery from, adverse events

Suggested critical aspects of preparation for expected adverse events are listed as follows;

- Service delivery – people need to know where to locate and access supplies and resources in an emergency situation, like who has diesel generators (and also rethink 'just in time' approaches).
- Infrastructure – people need to know what infrastructure is available (most rural people are very aware of time and distance issues – but newcomers from urban areas and especially those from outside the region may assume emergency services are immediately available as in the city).
- Inclusive community links – people need to be able to respond and quickly reach all groups in the community, in an emergency situation.
- Critical mass – a critical mass of people is required who are able to respond to adverse events, know what to do/act effectively (and direct operations), and support each other.
- Advance planning – people need to plan at least five years (but preferably 15-20 years) in advance to do as much as possible to mitigate the impacts of floods and water shortages.

As part of its work to provide information on community views about aspects of well-being identified under its Long Term Community Council Plan, Waimakariri District Council surveyed residents in 2007 on emergency preparedness (WDC 2008b). Findings across the district were as follows:

Emergency events for which households felt quite or very prepared for were:

- Snowstorms (68.0%)
- House fires (67.0%)
- Windstorms (59.0%)

Emergency events for which households felt least prepared for were:

- Pandemic (54.0%)
- Wildfire (53.0%)
- Flood (48.0%)
- Earthquake (46.0%)

While 70% of households from the rural part of the district indicated they had enough water stored to last for at least three days in an emergency event, only about 50% of respondent households in the urban Rangiora and Kaiapoi Wards had enough water stored to last at least three days. The message that the Council took from this was a need to raise householders'

³³ This reflects some of the frustrations that Margaret Wheatley records in her observations of ineptness of the bureaucracy post-Hurricane Katrina, when standard operating procedures were plainly inappropriate in the chaos of the aftermath of an adverse event, and officials were unable to comprehend what was happening locally (Wheatley 2006).

awareness of the need to store water separately for emergencies (WDC 2008:10-13). Around 97% of respondents across the district had sufficient food to last for three days, 67% had access to a battery powered radio and spare batteries, and 94% had access to a torch with batteries, or other alternative lighting not requiring electric power. About 82% of households across the District had the ability to heat their homes without electric power (rural people having the greatest flexibility in this regard as only 75% of households from the urban areas could heat their homes without electric power).

In addition 87% of households indicated that they were willing to work alongside civil defence for the benefit of their communities.

The Culverden focus group (Hurunui) highlighted the regulatory, political and social issues they had experienced as more significant than 'natural' disasters. The community had dealt with natural events in the past (such as the big snow of 1992 and the droughts of 1988 and 1998) and they knew that the coping strategies they had developed would work.

Adverse natural events can be anticipated and managed. Lovell-Smith writes that the first of the 1992 snows (the first of significance since 1945), caught the Hurunui district unprepared. MAF regional field staff provided leadership and co-ordinated support with Federated Farmers and the Hurunui District Council. "*Hay was donated by North Island farmers and food was provided by local people and city dwellers*" (Lovell-Smith, 2000:81). The second snow event that year was even more severe, but by then farmers knew what to do and had their own support systems ready. "*It became a huge community effort, helping people to acknowledge their interdependence, and also to recognise that the council had a positive role to play*" (Lovell-Smith 2000:81).

The value of get togethers after an event is well-recognised and the communities are expert at making them happen. The storm damage meeting and BBQ held in Waipukurau in April 2011 (noted above) is one of a long line of such events. For example:

After the 2004 storm farm families held neighbourhood events to enable people to come together and talk about how they had been affected. This was really important because the men work by themselves and find it hard to talk about things, and particularly things that are close to home and touch on the emotions. It's easier for them to share their feelings in a convivial atmosphere over a few beers. These events were also important for the women, because while they are more ready to talk about their feelings, most are in paid work and don't have the time for gatherings. The primary concern for most of the women is the wellbeing of their families.

In all the rural communities in the study there were mixed perceptions about the extent and value of preparedness before, and recovery support after, adverse events. Some people were upbeat about community preparation and readiness. Others were less optimistic. A recent study on preparedness for civil defence emergencies showed that while civil defence teams are well equipped and trained, as communities the local population is not well prepared for adverse events and not well prepared for recovery. We were told:

The community has shown it can deal with floods and will survive, but in reality there is little preparation for floods, and cleaning up and moving on is an issue for those affected.

The 'drought shout and sausage sizzle' is a familiar tool for bringing everyone together, and such events were frequently mentioned. Nevertheless a comment from the farm consultancy and support sector indicates there can be no complacency:

We are well set up for instant disasters such as floods and snowstorms, but not so good at slow burners like droughts. Droughts are hardest to deal with because they can go on for years. The animal welfare issues just go on getting worse where there is too much debt.

It's very hard to know when to hold an event in a drought situation. When there are landslips, floods or snow it is easy to work out when it would help to bring people together. Droughts creep up on you and it's not easy to tell when the best time would be to come together, and to even know when the consequences of a drought are really hitting and people need some outside support. Incomes are down and having sold capital stock for a pittance people are still on overdraft long after the drought has broken.

Other consequences of adverse events that are not always recognised include an increase in family violence, particularly in chronic drought situations.

Both Māori Women's Welfare League and Rural Women come into their own in supporting their communities prepare for, and recover from adversity. The League has a strong focus on teaching survival skills, whether budget savers through gathering foodstuffs and giving practical cooking advice, or through running marae-based seminars on matters as diverse as financial literacy, making retirement savings, and practical steps for water conservation. It devotes considerable resources to delivering services to its communities to address social issues such as family violence.

In an effort to prepare for the outcomes expected with climate change, the League has begun to work with civil defence, fire and ambulance services to provide its 3,000 members with the knowledge needed to deal with adverse events. Through its membership, the organisation reaches out to member's families. It argues it can mobilise around 100,000 Māori through whānau networks.

Everything is linked: the better their personal economic situation, the more actions farmers take, and when prices are right and spirits are up, there is a flow through to the rest of the economy. As one informant told us:

Farmers who had experienced the nineties droughts knew to take precautions and prepare for the worst. The preparations they could make depended on where they were in their financial/debt cycle [farm ownership, dairy conversions, etc]. Old hands stored silage and de-stocked. Farmers that had destocked weren't hit so badly in the recession that the retailers felt it. With the current good season there are now shortages: fertiliser is short, trucks are short, fencers aren't available, but prices are up, production is up, so people feel positive.

In CHB we were reminded that the coastal fault lines are constantly moving. The bentonite clay pan means that slips are endemic. "There is not enough action taken to plant areas where slips are insipient, and before the slips escalate across the whole farm". This comment points to the ambivalence some farmers have towards trees. Forestry is anathema to many farmers and farm leaders as they see forests as adversely affecting rural community viability. They

have already seen the impact of whole farms being planted in trees. There are no families on these properties – no families means no children at the local school, fewer families to participate in social, recreational, sporting and voluntary activities, and fewer purchases being made in local stores. There is a fear that more meat processing plants will close as sheep numbers go down, with a loss of jobs for local workers.

On the other hand the examples below (see Chapter 8) of farmers' efforts to 'future proof' their properties show that selective planting can make a considerable difference to the viability of the property, the resilience of the business and ultimately the resilience of the community. In this respect we were told that, despite the storm damage from the April 2011 event which destroyed most of the properties around him, one farmer on the southern (Porangahau) end of the damage *"still has a farm because of the extensive preparation he did. This is real resilience."*

Until the last coastal landslip event in April 2011, there had been antipathy towards planting trees as a way to guard against accelerated soil erosion. There is, however, nothing like an adverse event to prompt action. Both the farm suppliers and the Regional Council told us *"orders for [poplar] poles have soared since April, we can't get enough"*.

Comment

Most people in the focus groups recognised the value of planning for adverse events. However, no-one talked to us about planning for adverse weather events as an integral part of a bigger strategic/business, environmental/economic plan for the community (though the need for such planning when developing irrigation schemes was clearly evident to some). It appears that there is a need for a platform for wide community discussion around long-term strategic decisions.

Our findings support the connection between positive views of disaster outcomes and the ability to 'swing into action' and bounce back after disasters. In our discussions, however, we did not find a corresponding connection between positive views of outcome, and preparedness. On the contrary it seemed that confidence in the ability to successfully take action in an adverse event made people more confident that they did not need to plan or do much planning. This creates a tension between those who see the value of planning and want to plan, and those in the community who do not see a benefit in planning (or who at least cannot see the benefit in the kind of planning they observe happening).

For those who identified preparation as a positive community resilience factor, Paton's domain of outcome expectance for community resilience is relevant. However as indicated above there were a significant number of people for whom planning did not seem to be a significant resilience factor. It appeared to us that the higher the level of individual self-efficacy displayed, the less was the regard for significant planning.

COMMUNITY PARTICIPATION AND INCLUSIVE COMMUNITY NETWORKS

As indicated in the sections above, strong community networks appear to underpin all of the positive resilience factors:

Communities that work together are resilient. This ranges from the school working bee to people rallying round to help each other after an adverse event.

When the chips are down we help each other. That's the New Zealand way.

Farmers pull together to help each other deal with events both during, at clean up and afterwards. Rural people are quick to get out and fix things, whereas townies expect someone else to do it for them.

Mostly people operate in their own little world, but when something happens they pitch in.

To provide some context for their comments on community participation, the people who attended the focus group meetings and those we interviewed also talked about their communities – what they liked and did not like about them, and the changes which had taken place:

Waipukurau has always been an energetic, vibrant and supportive settlement. People do help out when things go wrong. Fathers play a larger role in childcare than they used to. The younger people have less time to be involved on committees and they are the 'me' generation (more wrapped up in themselves than others).

Wider social change (e.g. both parents working, 'too busy' 25-35 year olds) means that people just aren't available to do community work and build the networks, and don't have as much time to participate in their children's activities.

This is a fantastic community. Everyone works hard to fund raise for amenities. Waipukurau has an excellent sports complex and swimming pool.

We did a lot of fund raising for the rescue helicopter which is based in Hastings.

Sport brings people together in Takapau. We turned the old fertiliser bin into a squash court. The old school became a community centre with a bar and pool table, there's a swimming pool and play ground. As well as squash there's netball, tennis, golf, rugby. Whether Māori or Pakeha, freezing works staff, farmers, teachers, everyone gets involved in something.

We have a lot of social events in the district (Amuri) and everyone comes. We also have dinner meetings for Rural Women with a speaker and an annual fund raiser for a good cause. The women phone each other up to make sure they are coming to events and also to check everything is okay.

New ways of connecting with others are emerging, including the farmers market at Porangahau. This market is a drawcard and brings different elements of the population together.

People have come to live in the district because they like the area, they like the community, they like the space, and they can get involved in community activities, know their neighbours and participate.

Oxford is resilient – people here get involved in community events like the farmers market and the craft market. It's a vibrant community. The markets are kept going by the town people. We have 25 stalls with fresh fruit and food. We're almost big enough for another market. Jo Seager's restaurant has boosted the economy and brought in 35 part-timers.

Oxford has established a model rural health trust – it's brilliant, and the Council has established a bank/post office in its Oxford service centre.

Newcomers are welcomed. The real estate agent takes new families to meet the school headmaster.

Lovell-Smith (2000:131) writes of the Hurunui – but could equally be referring to CHB:

For many residents in the Hurunui district a strong feeling of community arises from the fact that their families have lived in the district for several generations and that they are part of a network of relationships which extend throughout the area. Many examples could be given of families who have lived in the Hurunui district for more than 100 years, and whose family name crops up again and again in records of schools, churches, sporting clubs, women's groups, service organisations or local government.

Waimakariri District Council periodically undertakes surveys on residents' needs and participation in the community. The 2007 Community Survey (WDC 2008b:64) showed that 60% of respondent households had one or more members involved in some form of community group. There was little difference in the level of participation between the urban centres and rural districts. The report also noted that the New Resident's Survey Report for 2005 had found 58% of the new resident households surveyed were likewise engaged in community groups or clubs.

A local pub can act as a focal point for socialising, but the school as an institution brings everyone together for social events, fundraisers, working bees, and so on. These kinds of activities tend to cut across social distinctions. It doesn't matter how long you have been in a community – but rather what you contribute.

The further from town, the stronger the local community - provided the local primary school is still in place, because the local primary school is a focal point. When the local school closes, unless there is another school nearby which people can identify with and become associated with, the heart goes out of the community. Where people are within commuting distance from a town, and the children bus into that town, there is nothing locally that draws the community together.

With both partners in a family tending to be in paid employment, considerable change has occurred in the way of life:

Regular social events that formerly involved most of the [Amuri] district have given way to smaller informal gatherings and families eating out at restaurants and hotels. The community halls in Cheviot and Culverden have been displaced by purpose built golf and rugby clubrooms (complete with bar facilities).

It's a tight knit community and for some professionals it's hard to find people with similar interests to socialise with.

There is a feeling that people aren't necessarily networking in the way they used to. With few staff, people have to do the work themselves and it's hard for them to find time to socialise. People work seven days a week and this impacts on the local clubs. It's hard to find people to coach [the sports team].

In the past farmers collaborated. Corporate managers are different. They don't have the time to mingle.

People don't really want the kind of hospitality that we took for granted a few decades ago: scones and the welcome morning tea. I know I should mix more, but there are entirely different kinds of people living here now. There is much more crime in the country now. If you leave things lying around they get nicked.

A lot of the time it depends on how in touch people are with their neighbours. If you don't know there is an issue you won't be there to help out. If you do, you take a casserole over. But there is less of that neighbourliness now than there used to be

There was talk of amenities (such as halls, schools, post offices, village shops, sports clubs) closing or merging, and a general lessening of access to community facilities. For some, this means increasing social isolation through lack of meeting spaces and places for casual interaction.

Workers' holdings have gone – they have been absorbed into larger farm properties. Lifestylers (people who own a small property – but are not primarily engaged in farming) are part of most communities now. There are lots of people (from farms) who travel into town to work – even from the coast. Because they work in town, they shop in town so a lot of local stores have closed – so that's gone as a place for meeting with other people.

The transient nature of some of the community was raised at the Culverden focus group – i.e. some people are only in the community for a short period of time and are not seen as having a commitment to the community.

People who rent land and also transient farm workers don't mingle with the community because they are not there long enough and are working long hours. They don't get involved with community projects.

Improved transport connections which enable a daily commute to nearby cities has also brought life-style changes, and these are seen to have reduced community cohesion.

A sense of community [this close to Christchurch] is non-existent. In the old days the phones would run hot if anything happened. Now people hardly know their neighbours.

While all three case study communities identified strong interest and participation in their communities, there was also recognition that not everyone is engaged or involved or included. We noted a tension between peoples' unanimous and deep-rooted view of their community as one in which 'we all help each other', and the conflicting idea that people came to in the process of discussion – that they largely helped each other only within their own social and community groups:

There really is a 'them and us' culture, even to the extent as to which supermarket you go to.

The foresters and the loggers are very different people. Foresters grow trees, loggers cut them down, and don't care about the mess that they leave behind. The farmers (foresters) have to clean up after the loggers, fix broken fences and so on.

There is a perception that city people don't understand the linkages between rural and urban and how beholden they are on the farm sector. Small town people are, however, very aware of these links and how much their livelihood depends on the fortunes of the farming sector. People living in small towns are often just as affected by the drought as the farmers. Because the farmers' children go to the same small town schools as the children who live in the small towns, the town and country kids mix and mingle.

The shift from owners to workers managing farms was also noted, although there was recognition that the numbers of share milkers had decreased substantially over the years, and the newcomers are being absorbed into the existing community. Davison writes:

Some of the early dairy farms were developed by out of district investors, often resembling 'carpetbaggers' who set up dairy units at lowest cost, utilising sharemilkers who often had to work under pressure to complete cowsheds and farm infrastructure ... [These] corporate dairy investors had little commitment to the Amuri community and thankfully have now sold and departed. The district also experienced the opportunistic move by city based social welfare agencies to place low income clients into cheap rental housing in the villages of Culverden and Waiau.... Our villages were losing young people and being populated by strangers with no concept of rural life, its opportunities and obligations....[By 2006, however, there were fewer transient sharemilkers and the churn of temporary residents was reduced to five properties] With few new conversions to dairying; the district is getting to know its new citizens as they join and lead the myriad of small groups that create and reinforce the social capital that creates a healthy community (Davison 2006:80-81).

Several examples were provided about how confidence can be eroded because people are excluded. In the Hawke's Bay you are still considered a newcomer even after living 10-15 years in the district. It is seen as particularly hard if you work outside the district. In Waimakariri the rural-residential, small-block owners are often not linked-in with the rest of the rural community. Some of the people who work in the city so are not on their property during daylight hours were criticised for not looking after their stock properly.

Alongside these more recent changes Māori are still experiencing the effects of being dispossessed from land through purchases prior to 1865, confiscations and alienations of land after 1865, and land subject to compulsory acquisition under the Public Works Act³⁴. Feedback indicated a low level of exchange and dialogue between Māori and non-Māori groups in general, despite peoples' best efforts, and it seemed that within the wider community there was probably limited knowledge of local marae, hapū, how they operate, and the activities they are involved in.

Local marae, and some non-Māori, appear to be trying to remedy this by seeking more dialogue, exchange, and joint projects, with other sectors of the community. We noted, for example, that Te Taiwhenua ō Tamatea's offer to host a community meeting for this research project was made with an expressed hope of the benefit of encouraging the building of wider networks. So far not all community groups had begun to work consciously at this level of strategic cross-group networking.

³⁴ In this context see Zodgekar (1997) "It seems that much of the land taken was not used to benefit Māori, but instead was a form of obtaining their land compulsorily" (p249).

In both Hawkes Bay and North Canterbury the language used reveals that the various segments of the community were somewhat isolated from each other, and there appear to be discernable differences between the groups. During discussion, people made distinctions between, for example, 'townie' versus farmer, dairy farmer versus sheep farmer, Māori versus non-Māori, seasonal workers versus permanent workers, beneficiaries versus rest of community, small-holders versus farmers, newcomers versus old-timers. People did not identify any expressed hostility between the groups, but did acknowledge little communication between them. Interestingly, at a school age level, young people themselves felt strongly that the final years of school was the only context in which community 'group' distinctions didn't exist or matter.

Despite indications that newcomers to the communities tended to remain in their social 'silo's', ethnic diversity was cited by some as being important for resilience in the community. Social inclusiveness was seen as an important 'twin' to diversity in strengthening resilience.

With the variable climate that we have, the communities that survive, that is, are resilient, have a strong economic base – they have skills, they have good schools (at early childhood, primary and secondary school levels), and resilient communities bring newcomers in and listen to their different points of view. We have migrant workers from other cultures such as the Philippines, Fiji and so on. They play rugby and are good workers. They have a different way of seeing things.

The takeaways, 'corner' dairies, bakeries and such like are now owned by Indonesians, Cambodians, Thai, Indians and other Asians.

The dairy farms look for rugby players as well as workers. We had three or four Samoans who were brought into the district to build up the rugby team. The local community is accepting of all the different nationalities and ethnic groups. We have a lot of Fijians and Filipinos. There are also a lot of English immigrants so soccer is becoming the 'big sport'.

Younger people expressed the view that they felt they were more racially tolerant and inclusive than the older generations.

Comment

A principle of caring in the community emerges as a resilience factor. It is clear that where people are willing to help each other, where there are strong networks, where people 'care and look after each other' and there is strong social capital³⁵, communities are considered to be resilient. This is closely aligned to Paton's domain of 'community participation' in terms of the extent to which 'people network and undertake activities together', but goes further in placing more importance on the strong underlying value of 'looking after each other', not just of doing things collectively.

The rapid rate of change (social, economic, government policy) in almost all crucial aspects of life in the community, appears to be a significant feature of community experience, and could be viewed as an adverse experience in itself, in terms of its overwhelming nature and peoples' linking of the change with loss of community identity and connection. Aspects of grief and loss were evident in many of our conversations in CHB (especially in stories about the past). In particular, we noted the stories of loss of traditional physical spaces for informal meetings –

³⁵ Note in this context Dr Papaarangi Reid's (1998) comment cited above in Chapter 4, p22.

the loss of these seems to have a particularly close relationship to feelings of loss of community identity.

Different groups appear to be at different stages of readiness when it comes to extending networks to include other parts of the community. Although we worked with only a very small number of CHB community representatives, we had a strong indication that some participants used our meetings as a safe and useful way to reach out to other parts of their community, to build community-wide networks. Community development networks can be strengthened when people 'piggyback' on meetings already being held by particular groups.

The existence of strong community networks appears to be the single most important factor for community resilience. It is interesting that it does not appear to matter at all what the purpose is for coming together (for example, whether for social gatherings or for more formal purposes). It is the manner in which the networking is carried out and the nature and quality of the participation that counts.

A complicating factor is the gradual extension of the rural commuting zone which has increased over time with improvements in vehicles and roads. The commuting zone is now around 1.5 or more hours from city centres. This has a major impact on people's availability for networking and getting to know the diverse groups of people within their community as well as their availability for leading or undertaking local activities.

SELF BELIEF

In the feedback, self-belief or confidence in being able to problem solve was seen as important for resilience, both in terms of individual self belief and community self belief.

Many people talked about the 'rugged individualism' of farmers and their can-do attitude. Many farmers, particularly those from the older generations, are loners and very individualistic. They are self-reliant and used to working on their own for very long hours. They have to be self-sufficient to be successful and survive. There seemed to be a mantra of "*we can manage on our own*" with farmers in particular being seen, and seeing themselves, as self-sufficient: "*Farmers [older males] don't talk about their problems*". However, this solid confidence in their ability to problem solve on their own, and strong resistance to outside help, can become a barrier to farmers seeking advice and assistance. We were told by several different community organisations that:

Farmers often underestimate their ability to carry on. They don't get help soon enough to turn things around before they reach the tipping point, or point of no return in economic terms.

Farmers felt they have no choice but to be resilient. This 'battling spirit' is widely seen as the key to farming communities' strength and resilience. We were repeatedly told that 'giving-in' is not an option – for male or female farmers, and that people go to amazing lengths to 'hang-on' to their property³⁶. This can be problematic when they should be leaving farming, but there is often great optimism that next season will be better:

³⁶ In this context we were told the story of a local woman whose farm property was a difficult one and who got into considerable financial strife during the drought years. Concerned her property was about to be repossessed by the bank she undertook a survey of farmers in the district and found some who were disaffected with the service or their treatment by the banks. She then garnered huge media coverage about "the banks' poor treatment of clients".

Around autumn is the danger time – if feed is short and the farmer hasn't taken action by mid-autumn [destocked], it's too late. From mid-autumn to mid-winter is 'suicide time'. When spring comes people perk up and think that they will be able to get out of the mess they are in. If these people were more realistic, they would get out of farming.

Getting out of farming was seen as not necessarily easy when farmers have only one opportunity to get the best return for the property and prices are down. Some farmers also feel they have no skills and no options but to keep farming. Coping with adversity mostly on your own is widely seen as building resilient people, but it can also lead to negative outcomes (violence, suicides). For the new generation of farmers, however, individualism and resilience does not come easily:

Young farmers coming onto properties now are not used to working on their own. It's very difficult for them, especially working in the back blocks outside cellphone coverage.

The North Canterbury focus group meetings emphasised the impact of isolation and distance from urban centres which meant that communities had to be able to sort things out themselves: This can be a problem for low-income people who have moved to rural areas for the cheaper housing, but have difficulties with transport and paying the higher costs of groceries sourced locally which have freight charges added.

Some families have plans, resources and a range of options for coping which they have discussed with their families. These people note that community resilience starts in the home through parents/elders modelling: *'you do things because they have to be done, your children do things because they have to be done'* and *'you do the spade work with your kids'* (establishing responsibilities, systems, routines, recreational activities), with the belief that such modelling within the family will feed into community resilience – children will take their learning into their community networks.

Comment

There is a connection between this factor of self belief, and Paton's domain of self-efficacy (individuals' confidence in their ability to problem solve successfully). However, for the people we talked to, community self-efficacy seems to have greater importance than individual self-efficacy.

Personal safety was hardly talked about, other than in the context of coping with personal stress after an adverse event.

Self efficacy in dealing with adverse events appears to be high for people confident of their ability to individually and collectively deal with the immediate impacts of adverse events. However, this may be fragile in the longer term.

POSITIVE PROFILING OF THE COMMUNITY

There were some strong feelings about the importance of presenting a positive view of communities to outsiders. In this respect, there was some question about the role of the media in its influence on community resilience.

By going public the issue was turned from her land management to the banks' client management, and the process gave her more time. She was still on the property when the drought broke, enabling her to improve production and start reducing debt.

The mainstream media (TV and urban newspapers) tended to be not trusted. There was strong resentment at media misrepresentation as this was seen to not only convey false information, but also to polarise attitudes.

The media's need to create simplistic negative stories is a major threat to communities. They create 'them and us' situations that create toxic tensions between and within communities.

There were negative comments on how local issues were reported – and the negative profiling of communities and groups that create barriers to gaining mutual understanding. Media representation is seen to pit town and country against each other by, for example:

conveying pictures which imply all dairy farmers pollute rivers and farmers don't pay tax, which are not true. You only get the bad not the good stories.

Some people felt that television tends to sensationalise bad news, going for the worst cases to get people to watch. Some farmers felt the media was not balancing bad stories with items on what the majority of farmers are doing³⁷.

COMMUNITY EMPOWERMENT AND INSTITUTIONAL RELATIONSHIPS

Feedback showed a distinct lack of trust in central (and often regional) government and its policies as a supporting factor for resilience, and in all case study areas there was a strong expression of desire for community control of its own issues and decisions.

Few positive comments were made about central government and any role it might play in climate change awareness or disaster recovery following adverse events. Given their experiences since 1984 rural communities expect to be on their own, and:

The assistance criteria [following an adverse event] are very harsh. You have to have sold off all your assets before assistance kicks in. You are not going to be able to get back to where you were again.

Government regulation was seen as a greater threat to community resilience than natural events. On the basis of their experience of regulatory, policy and market changes beyond their control North Canterbury focus groups had little trust in central government agencies. They felt they had more ability to manage natural threats than perceived threats to the social fabric of their communities from the institutional powers based in Wellington. Many felt powerless against urban dominated voting power, popular politicians, or faceless Wellington bureaucrats:

Regulation kills initiative – it's our community; if we have control of it then we can manage and respond in an appropriate way.

People said they were worried about the harmful results and damage to their communities of irrational decisions made by policy makers who do not know rural communities or understand how they work. Examples provided include the following:

³⁷ For example, work to improve water quality and irrigation efficiency within the Hurunui Catchment by DairyNZ, Fonterra, the Canterbury Regional Council and farmers has led to significant reductions in phosphorus and E. coli in the Pahau river, a lowland tributary of the Hurunui (Primary Sector Water Partnership Annual Report 2009-10, page 12)

- School closures “*take the heart out of the community*”. Quality schools bring new teachers into the community and lift skills and knowledge. *The Education Ministry/Minister is not listening to what the community wants or needs.*
- Heavy-handed Occupational Health and Safety regulations create a risk adverse community, limit freedom to respond, and are impractical e.g. *restrictions have been put on giving kids lollies from the fire truck*, also an example of the professional paramedic who was not allowed to do any voluntary work (even coach rugby) 24 hours before he went on duty.
- Hospital closures – the fight to keep the local hospital open was discussed³⁸ in the context of the perceived “*steam roller of central government power*”. The community’s response was to take action by providing voluntary assistance, forming the Friends of Waikari Hospital, raising funds and keeping the hospital open.
- Exploitation of volunteers – the increasing demands made on some professional volunteers e.g. fire fighters, ambulance staff, was highlighted. *They [the volunteers] need more and more training, so the barriers to entry are getting higher and a challenge for recruitment.* This was contrasted with urban areas where all these roles were undertaken by paid staff. There was agreement that minimum training and performance standards were essential, however expectations needed to be realistic to attract and retain volunteers. Other issues included ever increasing time commitments and that some employers were not prepared (or able) to give people the time off (or flexi-time) they needed to participate in emergency service delivery.
- Exploitation of community – for example ‘dumping’ of beneficiaries in Waiau was highlighted. These people were a long way from services (e.g. Work and Income NZ offices), and significant social problems occurred (e.g. crime went up). It took considerable community input to help address this (e.g. volunteers taking people without cars to the doctor).
- Closure of large industry – the examples of closures of government departments, processing plants and a local sawmill were mentioned as having a big impact on their respective local communities.
- Access to resources – this was highlighted as one of the most significant potential threats in relation to water. “*If they take away our access to the water they will destroy this community*”.
- Limits to farming – restrictions on land use and inputs. Some of this was framed as the power of minority groups to change policy, such as articulate and well positioned ‘greenies’.
- External values being imposed on the community without taking the time to see the full picture and finding win-win solutions.

³⁸ People were forthright about “*the stupidity of that decision if it had been successful*” in light of lower operating costs, issues from the earthquake and hospital space in Christchurch, and lack of real consultation at the time.

- People don't want to be *told what to do by outsiders. If people know what to do [are empowered] they will feel in charge, will have positive expectations about outcomes and will get on and do it.*

ACCESS TO RELEVANT INFORMATION

Informed and aware community members were seen as critical for community empowerment, in terms of levels of resilience. Confusion around the climate change issue itself is an example of the need for meaningful information.

People felt that it was important to create opportunities for local people to meet to discuss the 'bigger picture', as this could lead to other discussions (including with school students) about both the form and delivery of information when planning for adverse events, social, education, health and other strategic issues and options. We perceived some frustration from community representatives about the difficulties of attempting to network in this context.

Sometimes more information can be critical. Students reflected that while they have been drilled for emergencies, they don't know what to do if the emergency doesn't happen while they are at school, or what to do in the following days and weeks.

Comment

In each discussion group there were participants representing groups in the community who expressed a wish to be in touch with specific other groups that were not represented at the meeting in question. Information about the wish to get in touch could usefully be conveyed to the people who did not hear it voiced.

STRONG VOLUNTEERING ETHOS AND CAPACITY

There is recognition that rural New Zealand has changed, particularly in areas where dairy farming is important or becoming important. The 'gypsy' aspect of the dairy farm workers' lives (shifting to a new farm every twelve months or so) is seen as destabilising rural communities, creating schooling and family issues. These and other changes are seen as also impacting on the capacity of the volunteering sector of the communities, which has traditionally provided the basis of support both in preparing for, and responding to, adverse events.

The principle of providing voluntary and reciprocal support was promoted as important for communities, and is still believed to be alive and well in some areas, especially in terms of short term assistance and recovery;

The key to being resilient is knowing you have solid neighbourhood and friends' support. You know that people will be around with a pie or a casserole, will just go and 'feed the chooks' for you, and you'd do the same for them.

After the April storm 15 people turned up to help replace the boundary fence next to the DoC [Department of Conservation] reserve. Farmers donated their shepherds for a week to help others.

We were without power and water for two weeks and the neighbours just turned up and jacked up a generator for us to pump water. In the UK we'd have had to wait weeks for assistance – here people got things happening fast.

However, there is a growing concern that where once it was taken for granted that local rural women would run school and community activities on a voluntary basis, these women are now in paid work and do not have time to keep the longer term community activities going.

There are also intergenerational issues. The older generations said they feel that young people are more self-centred and self-oriented, unlikely to be effective in adverse events unless community involvement is 'role-modelled' by their parents, for example:

The young folk often don't know how to do stuff that we take for granted. When the women are working it's easier to buy a packet of biscuits than to make them. My husband does all the cooking and I've made sure both my boy and girl can cook. We buy as much as we can from the local store – this is part of community resilience.

Too many younger folks are not getting involved in voluntary organisations. They have different priorities, are career orientated and don't have the time. This means organisations like Meals on Wheels are struggling to find volunteers.

Comment

There are several levels of volunteering in communities that have been affected by wider economic and social change.

First, it is clear that many communities no longer have the strong social neighbour networks that make it easy for the effective provision of spontaneous and short term voluntary help: *A lot of the time it depends on how in touch people are with their neighbours. If you don't know there is an issue you won't be there to help out. If you do, you take a casserole over. But there is less of that neighbourliness now than there used to be.*

Second, and equally important, is the loss of the longer term volunteer services that have traditionally been built into the infrastructure. Thus, although the ethos of volunteering is still upheld and considered to be a key factor in resilience, the capacity to follow that through in practice is a different matter.

Third, the demographic shift in rural areas. Rural areas are now dominated by older and younger people and are experiencing the loss of several cohorts of energetic young adults who would, in previous decades, have been there to 'help out'.

Erosion of the volunteering sector as a barrier to resilience implies an undermining of resilience factors of both action coping and of community self-efficacy as described by Paton's model. However, once again, there is an implied emphasis for those we interviewed on the importance of collective rather than individual action coping and self efficacy.

EFFECTIVE LEADERSHIP

There were conflicting ideas around leadership. Some said that there was a good range of leaders in the community who came forward to lead the different projects, and this variety was seen as positive. Others felt that it was the same few people doing all of the hard work.

Although we found there were different views around the meaning of leadership, major characteristics required by all were the ability of a leader to empathise (in particular those who had experience of adverse climatic and other events themselves, and could 'walk the talk' and could 'walk in others' shoes') and the ability of a leader to listen, genuinely consult and take

account of collective wishes. In terms of leadership in times of adverse events, the leaders that were respected were those who had a 'grass-roots' practical approach.

There was recognition of the need for continuity, and some concern that the younger generation does not recognise the value of contributing:

Communities depend on good leadership and individuals to drive projects through. If those people leave, the organisation often collapses if no succession plan has been put in place

In our parents' generation leadership was about service. Generation Y is much too focused on what's in it for me and far too interested in instant gratification to understand the value of service.

Another clearly expressed idea with regard to leadership relates to the concept of collective leadership, that is, facilitation of collective ownership of issues and processes for community group solutions (examples are provided under the section on community decision making).

Council leadership

Waimakariri District Council is regarded by its community as providing quality leadership in its focus on community well-being. It has a nine-staff community team which works closely with NGOs and central government agencies on community development, injury, crime, road safety restorative justice and social service co-ordination. Its philosophy is that "the people most able to solve the problems are those who live in that community" (WDC 2009:4). The 2008/09 report on the team's work identifies a strong focus on networking and community participation that engages residents from youth to elderly, links with the local Kaiawhina³⁹ to plan initiatives appropriate to Māori residents, supports new residents, and undertakes joint initiatives with neighbouring Hurunui Council.

Hurunui District Council employs a Community Development Advisor whose role is to enhance community participation through connecting people and coordinating projects and activities. There is a particular emphasis on connecting youth with the community, and one mechanism for this has been the establishment of a youth council.

The community had trust in people who were active in getting things done – people who will get on board and work alongside the community.

Local solutions are best, but it is likely that in future some of the regional councils' work may be taken over by the Crown because of the cost. The debt structure of family farms makes it harder for them to pay rates for local infrastructural developments.

Leadership through co-operation and good communication

In all the communities, people were very clear that if you want to cope with adverse events, you need to listen to the community to find out what needs to be done, how it needs to be done, and by whom. People valued the advice and leadership of those who were practical, down-to-earth, who had '*been through this before*' and could genuinely empathise, and who were prepared to work alongside you.

³⁹ See Appendix A: Glossary

Institutions like local government were expected to take the lead in dealing with adverse events and other issues, but some doubts were expressed about the strength of this link:

Some of the smaller local authorities are not able to handle the complexities of the changes that are occurring now. There is a need for decisions to focus on the long-term, handle great complexity and cover very large geographic areas. This can be costly. Smaller councils may not have the capacity or technical staff.

Peer pressure

Davison mentions in his thesis that leadership in the Amuri is diffuse and understated, with volunteers often invisible to outsiders. Getting things done requires persuasion and peer pressure with a sense of common benefit and community (Davison 2006: 85). Peer pressure was also mentioned in the Culverden focus group meeting as an important way of developing and maintaining standards and holding community values⁴⁰.

Farming leadership

The leadership styles of dairy farmers and sheep farmers are very different. Dairy farmers focus on performance with twice daily milkings where performance is tested, whereas sheep farmers' performance is judged on annual measures such as lambing percentages and carcass weights.

In addition to new ideas with an immediate economic value, there is the challenge of getting farmers to accept 'new' practices with environmental and climate change benefit. For example:

Leadership is needed to improve the physical resilience (or environmental resilience) of hill country farming. The land is not homogeneous and not all is good for livestock production. Where it is highly erodible and production is poor, it should go into 'permanent foliage' (trees). New slips which occurred on the coast in April were predominantly where there was little or no tree cover.

While some farmers are responding to this message, as noted above, others do not agree.

Action to maintain and build social services

There is clear evidence of strong and stoical community spirit in all the case study communities, with people helping each other and working to support their community in and after adverse events. However, to sustain wider community resilience in the long term, there is an expressed need to increase networking across and between different groups in the community. The sharing and openness demonstrated in the discussion groups indicates a willingness to move in this direction.

All the rural communities provided examples of joint action taken under the guidance of community leaders (councillors, mayors, school principals, voluntary organisation leaders) to articulate and resolve local social service issues of concern to the community. For example:

A major adverse event for the Central Hawke's Bay community was the closure of the local hospital. The community got together and set up a Mayoral Health Task Force. The Mayoral Task Force gained the attention of the Hawke's Bay District Health Board

⁴⁰ This is similar to the peer pressure Carolyn Morris (1993) identified in her Taranaki dairy farming study where farmers were persuaded to act for 'the good of the community'.

resulting in the establishment of a one-stop-health clinic in Waipukurau. The clinic is an integrated health facility. It provides sub-acute inpatient care for nine patients, community outpatient services (such as audiology), specialist clinics from visiting specialists, private practice of four General Practitioners, plus mental health, radiology (x-ray), social workers, occupational therapists, district nursing services, physiotherapy and public health services. The task force is still operating today with a role of monitoring the health needs of the district's population. This includes considering a succession plan to ensure that the General Practitioner service is maintained after the current ones [GPs] retire.

The district volunteer ambulance service was to be closed down. The community also rallied to retain this service.

During 2009-10 community leaders within the CHB district sought funding from the Ministry of Social Development/Ministry of Youth Development, and Department of Internal Affairs to carry out surveys and analyses of community health and other social service needs, and to support a youth development strategy. A Youth Council was established in 2009 within the CHB council structure, and a Youth Forum outside the more formal framework is now sought. Concerns about the well-being of local youth also led to the establishment of a volunteer breakfast club which caters for about 20 young people. Among other things, the need for alternative education services in the area were identified, and a One-Stop-Shop for Youth connected to the Mayors' Taskforce for Jobs initiatives was established⁴¹.

Stretching scarce resources in education with new technology

North Canterbury rural communities have similar stories of local leaders' action to make a difference. In 1994 an experiment with establishing common timetables and providing shared classes across seven secondary schools in Canterbury meant that the students were able to get excellent teaching in their specialist subjects:

Two years later we had 22 extra subjects on offer to students. This meant the students could stay at their local school and not need to go to boarding school in the city. This has spread to Otago where seven or eight secondary or area schools use video conferencing through Otago-net to teach a broader range of subjects. We can do this now we have more bandwidth and faster downloading of data

This work led, in 2006, to the establishment of the Greater Christchurch Schools Network, a cluster of initially 68 primary, intermediate and secondary schools across Christchurch and the Greater Christchurch region⁴². There are now (in 2011) 91 schools in this cluster. The aim is for all 161 schools in the region to connect.

With the availability of fibre-optic cable, schools are able to work closely together and share teaching resources. This means where schools do not have, for example, teachers qualified and capable of teaching a foreign language in their own school, students are still able to connect with trained teachers and other students, access appropriate learning environments, and access new resources such as foreign language television services, and shared e-library resources. Spin-offs include connecting students with potential career pathways by linking them with business and workplaces across the region, and enabling them to see what people do in these workplaces. Schools save money by

⁴¹ See also Bass 2010, Giddens 2011.

⁴² Moffatt 2009

making bulk purchases. Teachers improve their performance by working together and sharing ideas, research, and resources.

Comment

Willingness to try out new ideas or adopt new practices appears to depend very much on the way in which messages are conveyed. As noted earlier, people do not wish to be 'told' how to do things by someone from outside of their community, and collaborative and partnership approaches from within the community would appear to be the most effective way of gaining acceptance for new practices.

- Technology is a key contributor to enabling resilience.
- Leadership is most effective when it works from within the community and responds to the express needs of the community participants.
- Community (and family) social and institutional networking should be the focus in preparing for adverse events. Leaders would do well to note that the specific content and purpose of such networking does not seem to particularly matter – it's the networking in itself which provides long-term resilience.
- We did not find that people had difficulty in defining and articulating issues and many who participated in the research were leaders themselves, in the home and in the community. What seemed to be missing for them were the processes for sharing issues across all groups, and then following through with action. A key problem in the small communities (and one identified by a number of people) seemed to be the difficulty for the community in mobilising energy and action in time to make a difference: many felt that their community typically activates its energy '*just too late to be effective*'.

Our findings on leadership support Paton's identification of 'articulation of problems and solutions and demonstrating leadership' as a domain for community resilience. However our feedback suggests some real dilemmas around what kind of leadership and how it is executed, as primary influences on whether leadership is a positive or a negative factor.

8. MEASURES TO MAINTAIN AND ENHANCE COMMUNITY RESILIENCE

When research participants talked about possible actions to support resilience in their communities, they gave many examples of positive and effective actions already being taken (some of which have been documented and published), as well as talking about possible future actions. Some key examples are presented below.

ACTIONS BEING TAKEN TO ADAPT TO CLIMATE CHANGE

There are role models among the farmers in both the Central Hawkes Bay and North Canterbury communities whose action in developing the resilience of their farm businesses is seen as a relevant response to climate change. Being east coast farmers susceptible to drought they are mostly easing back on stock numbers, planting trees, fencing and reticulating water. But there are many other actions that these farmers are taking. Examples from CHB and North Canterbury include:

Tikokino Malcolm and Rohan O'Dwyer (from Kenny 2005:65-71):

- Machinery use is kept to a minimum, reducing fuel bills and soil compaction.
- Paddock subdivision has been organised to minimise damage to soil, maintain good quality pasture through grazing management, and optimise production.
- Lambing is delayed until spring when ewes are in better condition and climatic conditions are better for lamb survival.
- Riparian areas have been destocked, fenced and planted with natives.
- Water is reticulated to every paddock on the farm.
- Trees are an integral part of the picture, but there is a clear demarcation between areas dedicated to pasture production, commercial forestry and conservation plantings.

Hutuma Steve and Jane Wyn-Harris (358 ha sheep/beef) (Supreme Award Winners Hawke's Bay Ballance Farm Environment Award 2011):

- Using the experience of storms during lambing, planned and planted 50,000 trees over 30 years (29 ha of forestry and 6 ha of other species including trees for stock shade, shelter and fodder, for farm beautification and productive nut trees Intensive subdivision of paddocks, each with reticulated water, shade and shelter⁴³
- Fencing off "all hills that could possibly slip" to ensure runoff is filtered and the flow of water in heavy rain events is moderated
- Fencing off remnant cabbage trees, collecting the seed for further planting
- Genetic improvement through performance recording (Marlow Coopworth stud), artificial insemination, and DNA scanning
- Breeding for facial eczema tolerance
- Feed budgeting.

Porangahau James and Jane Hunter (660 ha sheep/beef) (winners of two Hawke's Bay Ballance Farm Environment Awards in 2011):

⁴³ Wyn-Harris writes in his column that with the storms forecast by the MetService his shelter belts made quite a difference "I kicked those [ewes] that had lambed out of the paddocks with good shelter belts protecting from the south and put the in-lamb ewes in their stead. Other mobs of ewes to lamb were shoved into forestry blocks and the odd fenced off area with a bit of cover. Someone said to me that I was lucky to have shelter belts but I can tell you that if luck is the same as hard work and some cost then yeah I was lucky all right!" (*NZ Farmers Weekly* 22.8.11)

- Planting waterways
- Creating inter-connected dams and filtration zones
- Fencing off native scrub and tree vegetation (development of 10 QEII bush and scrub covenants)
- Draining, mole ploughing and fencing winter wet clay hill areas (making these “as productive as some flats and can grow chicory and heavier crops to cover summer dry and droughts”)

Hawarden Dugald and Mandy Rutherford and son James Rutherford (3936ha of sheep, beef, deer for venison and velvet, forestry, and a trophy hunting business – the operation is spread across three properties) (supreme winners of the 2010 Canterbury Ballance Farm Environment Awards):

- Soil health on the fragile top soils is managed by reducing stocking rates when needed
- Planting poorer pastoral areas in forestry – trees have been planted since the purchase of the 3477ha home property in 1975. There is now about 200ha of trees which are used for stock shelter, soil conservation, income generation, and as a retirement fund to assist with intergenerational settlement
- Matagouri has been retained to provide wind and snow protection for stock
- Biodiversity has been improved through enhancing flax and native grass regeneration, and planting native trees in fenced-off agroforestry areas for stock shelter
- Controlling for pests such as wild cats, possums and ferrets
- Genetic testing (Corriedale stud) and virtually direct marketing fine wool from the Merino and Corriedale flocks
- A deliberate long term plan has been behind the big decisions such as the approach to diversify and achieve an operation that is sustainable in the long term.

Rotherham David Jones (178ha dairy farm with 500 cows producing 230,000kg milksolids per year) (Supreme Award winner Canterbury Ballance Farm Environment Awards 2006):

- From 1999 worked on switching the irrigation system from border dyke to spray gun (efficient water usage and enables retention of shelter belts)
- Re-grassing using AR 1 ryegrass to achieve better animal welfare and improve per cow performance
- Spraying effluent to improve poorer land and stimulate shelter belt growth
- Working to attract and retain staff (on the farm and in the area)
- Has an approach that focuses on sustainable land management, strong animal welfare practices, good employment conditions, and developing an attractive property through being environmentally responsible, socially accountable and having sound business performance
- Utilising off-farm involvement in scientific research for on-farm improvements .

Culverden David and Voray Croft (290ha including a 100ha run-off with 550 cows producing 250,000kg milksolids per year – the farm was purchased in 1992 from David’s parents who had bought it 30 years previously, and converted from beef, sheep and cropping to dairying, installing irrigation in the process) (winner 2008 LIC Dairy farm award):

- Attention to animal health and feeding management through pasture renewal, feed cropping and feed balancing to support cow production and well-being

- Installation of a collection pond to allow recycling of border dyke irrigation water through a centre pivot and sprinkler system to maximise water usage and expand the irrigated area
- Monitoring of nutrients in water run-off
- Planting trees for shade and shelter for the cows
- Focus on the four full-time and one part time staff and their work environment

Kenny writes that by taking a community approach actions of individual farmers become more effective. For example, where all land owners in a catchment plant trees and manage their land according to sound environmental principles, protection of the entire catchment is possible. So long as some farmers do not do this, properties are susceptible to slips from adjoining properties, and from weeds, pests and diseases brought into their properties during floods (Kenny 2005:69).

Comment

There are clear examples of action being taken by individuals to prepare for and mitigate the effects of adverse events, and much of this activity is also appropriate for mitigating and adapting to the evolving effects of climate change. Many people see '*drought is the new norm*' and that they need to manage to this. Their collective actions are building resilient farming communities. Others like to think that the norm is 'a good year' and are not realistic about their future prospects.

COMMUNITY INITIATIVES TO MAINTAIN AND ENHANCE RESILIENCE

In each of the case study communities some fundamental steps are being taken which are building community resilience. Several examples were provided of how individuals and groups of people have influenced what happens in their community. They include the schools' networked e-learning initiatives (noted above), the work undertaken by the Amuri Dairy Employers Group, the Canterbury Water Management Zone committees, and the Oxford Community Trust (OCT) particularly with youth.

Amuri Dairy Employers Group

Concern over the working conditions of dairy workers in Amuri, together with their very poor reputation⁴⁴ as employers and difficulties retaining staff, led local farmers to establish a dairy employers association in the district in 2000. After a successful start, the group went into recess but was revived in 2010.

The group now has monthly meetings, coordinates training sessions for employers and training for employees (middle to senior management staff running farms on behalf of the owners), and has raised standards and considerably improved conditions of employment for staff on the local dairy farms. Training is provided by Enterprise North Canterbury, Dairy NZ and the Agriculture Industry Training Organisation.

Members of the Group must attend at least one training session each year, and ensure their employees are aware of Group values, and arrange farm assessments against the Code of Practice. Discussions range from changes to immigration legislation, to the basics of being a good employer, business and people management, health and safety responsibilities, and

⁴⁴ According to Davison, Amuri had an 'appalling employment record' and was 'a place to avoid' (Davison 2006:81).

promoting Amuri. Animal management and welfare topics are also covered, as is managing farm effluent. The training sessions include social activities which assisted newcomers to meet others in the district.

The Group has developed a 'welcome to Amuri' booklet for new migrant workers which tells them what to expect about life and work in the Amuri Basin. It includes things like where to take rubbish, how to borrow library books, where the schools are and how to get children enrolled, information on visiting the GP and the payment system, where to get passports renewed, and so on. The Group also runs welcome parties for newcomers.

Canterbury Water Management Strategy

A collaborative integrated approach is being followed in the most recent work on resolving Canterbury's water crisis. This approach, which places decision-making and other tasks at the most localised level possible (the principle of subsidiarity), is now accepted reality. The zone meetings for the Canterbury Water Management Strategy have been a revelation to all involved. There are now compelling reasons for people to be willing to find solutions. People have moved from only considering the cheapest and most effective solution from the perspective of, for example, their own irrigation needs, to a consideration of approaches that are environmentally sympathetic and take account of other water users. The solutions may be less efficient from the point of view of farming, but in the long term there will be a greater win-win for the whole community. The approach was explained this way:

While I might not agree with the bloke from Fish and Game, I've got to know him at the [zone] meetings, and I think we can sort it out.

The experience of a consensus approach at the local level means that people are now saying:

we've now got an idea of the other fellow's problems, so we can find a solution that works for us both.

Each zone has run its own series of meetings. In the Hurunui-Waiau zone the Land Use and Water Quality group has run an experimental project aimed at developing guidelines for Land Use and Water Quality within the Hurunui catchment that takes account of social, economic, cultural and environmental values. It has involved about 40 people including Fish and Game, kayakers, tourism operators and farmers. There has been considerable conflict over the use of water: for example, should recreation (such as white water rafting and attraction to tourists) take precedence over more intensive farming?

The debate has flowed across the community and been picked up by other organisations. For example, the Amuri Dairy Employers Group has provided its members an opportunity to discuss water quality, land use intensification, irrigation water supply and reliability within the context of the Hurunui-Waiau Zone Committee's work.

The Waimakariri zone committee has followed a similarly collaborative process to attain actions and tactics that integrate multistakeholder perspectives and cover the range of issues of concern from improved water storage and irrigation to recreation and environmental protection.

The Oxford Community Trust

(From a video funded by Creative New Zealand and ALAC)

The Oxford Community Trust (OCT) links with a range of voluntary and other organisations to provide services for all age groups from holiday programmes for pre- and primary school children through to working with the local Lions club to distribute firewood to the elderly.

Social Services Coordinator Jo Ealam says “this is a community like any other community with the same range of issues”. Unlike many other communities, however, Oxford has pulled the different elements of its community together and introduced innovative approaches to community and individuals’ problems that work. It provides support on pretty much everything including budget, legal, drug, alcohol and gambling advice. The Trust works at a pace that is appropriate and allows the time needed for people ‘who have hit rock bottom’ to work through their problems. “If it wasn’t for Jo, I’d be in prison or dead... I didn’t think I’d make 25. Now I’m 27 and through their [Jo and the other OCT workers’] support I’ve come this far”.

Significant damage used to occur in the weekend with young people having no transport, nowhere to go, and drinking too much. “It’s a neat place to live, but there were problems because it’s isolated and lacks facilities where kids can go, so we had to work to fill the gap”. The Trust’s Youth Recreation Worker helps the young people to run weekly events like Paintball, movie nights, sports nights, monthly mall trips and an annual event (e.g. clay shooting, or a Talent Quest). The kids are asked what they want to do, and they organise it and run it. They have set up an after-school drop in centre. The kids say of OCT: “they’re awesome – pretty cool people to hang out with”, “people don’t feel left out – everyone’s included”. Much of the activity and event management is undertaken by the older students under the Gateway programme run by the school. The students’ performance is assessed and forms part of their school qualifications and work experience. As well as gaining experience in managing and leading an activity, the young people trial areas of work they may want to turn into a career.

All events are alcohol free, and the young people manage this themselves. Party packs are available to young people organising parties. These contain balloons, water, a \$50 food voucher, and condoms. Teen parties are planned with the help of the local police. The local constable says that by thinking through where it’s being held, who’s coming, what might happen, the young people are helped to work out in advance what to do if anything does go wrong. With the support of the Trust there has been a huge improvement in how the community and youth relate to each other. “The young people have taken ownership of the township” and are regularly involved in community development activities for their area.

Waimakariri District Council has developed a grassroots-up youth development strategy on the basis of the OCT example. By popular demand the Council is funding its extension to the whole council district.

Producer/Director: Tony Benny; Camera: Graham Ritchie; Editor: AJ Bean

Oxford Community Trust

Established in 1995, the OCT was designed to help people access government services. This gradually expanded to giving people in the community whatever support they need, in Oxford. The Trust is funded by the Community Organisation Grants Scheme, Lotteries, the Alcoholic Liquor Advisory Council (ALAC), Canterbury Community Trust and the WDC. Funding is also raised through a local shop staffed by volunteers called the “Budget Boutique”⁴⁵ and locals donate to a food bank also run by volunteers.

The Trust is directed by a Board of seven ‘community minded people’. The Trust is enabling community development from the grassroots. Its approach is to build the capability and capacity of particularly young people to manage their own affairs in a safe learning environment and develop leadership skills which are bringing the whole community together (see box). Without the work undertaken by the Trust there would be major problems of disaffected youth.

Young dairy workers can work 11 days in a row with three days off. They can end up not eating well (because they can’t cook, and live on junk food), having big parties and binge drinking.

Because of their involvement with the Trust, the young people themselves are dealing with their partying and drinking in an effective way, with support from the Youth Recreation Worker. The work being done by the youth under the auspices of the Trust is providing a role model for similar initiatives elsewhere in Waimakariri and North Canterbury.

Action to combat the rural-urban divide

There is concern that a rural–urban divide impacts on rural communities’ ability to influence national level policies that impact on them, particularly due to mainstream media representation of ‘farm issues’ (noted above). Despite a MAF commissioned survey undertaken three years ago which showed urban people have generally positive views about rural New Zealand, acknowledge the importance of the rural sector, and are willing to subsidise services to rural New Zealand, rural people are concerned about a perceived lack of real understanding about farming and rural issues (MAF 2008:11). The report to MAF indicated that nearly 60% of the urban people surveyed do not often make visits to family or friends living in rural New Zealand, 60% of urban people do not have family or close friends who work in farming, nearly 80% of urban people do not have family or close friends who work in horticulture, and even fewer (14%) have friends/family working in forestry (MAF, 2008:43). Industry leaders are concerned that urban people and especially the many newcomers to New Zealand who settle in urban areas do not understand the importance of the primary sector to our economy, or have any idea how New Zealand’s agricultural sector operates.

Rural leaders are concerned that issues that are seemingly unrelated to rural New Zealand can have severe impacts on the rural workforce. For example, raising the age at which young people can gain a driver’s licence (because of drink drive issues) reduces older teenagers’ access to work. No licence means no transport so access to employment in a rural area is problematic. The demographic profile of rural New Zealand shows a growing exodus of young

⁴⁵ The Budget Boutique is a fund-raiser for families in Oxford that are in need. It supplies firewood, food parcels, and school trips for kids who would otherwise miss out. Three times a year local people can fill a shopping bag and pay just \$3 for it.

people to urban areas where public transport enables them to access work. Rural leaders question whether most of these young people will return.

To try to combat the perceived knowledge gap among 'townies' Federated Farmers has set up national farm days in 24 districts across New Zealand and invited people to come out to see a 'normal day's work on the farm'. This programme has been going for three years.

The Walking Access Commission was set up with the aim of improving understanding by urban people about rural places. Some people see allowing walking access through their property a threat (concerns about their liability if anyone gets hurt on their property), others see it as an opportunity.

Comment

In connecting 'empowerment' with 'ability to influence' we noted that many sections of the community were as much or more concerned with the ability of the *community* to collectively influence change and make a difference, as with their personal ability to influence what happens within their community.

Local and regional government

The Hawke's Bay Regional Council has a view that people may not know their neighbours as well as they may have done in former times. Consequently the Council is taking this into account in the way they are structuring their civil defence activities. They are appointing professional Civil Defence and Emergency Management group controllers to coordinate activities and bring people together.

Local government is seen as very effective in immediately responding to an adverse event – whether the September 2010 earthquake (Waimakariri) or the April 2011 floods and landslips (CHB). Recovery measures included community meetings in both locations to assist residents come to terms with the issues and work out what they needed to do next. Regular newsletter mail drops to Kaiapoi residents whose houses and/or businesses were earthquake damaged were regarded as excellent in keeping people informed.

In CHB there was some concern about community representation due to the demise of community boards, and anxiety about the likelihood and impact of future council mergers.

Rural Support Trusts

The combination of droughts over the 2006-9 period and poor prices resulted in government (MAF) putting the current adverse events framework into place. Rural Support Trusts operate throughout New Zealand. Hawke's Bay currently has two organisations: The East Coast Rural Support Trust (with a taxpayer sponsored coordinator) and the Hawke's Bay Primary Producers' Adverse Events Trust⁴⁶ (managed through taxpayer funds held by Federated Farmers).

The North Canterbury Rural Support Trust's primary role is personal and family welfare and support for the local community 'whose livelihood is predominantly related to farming' at times when they have been impacted by adverse conditions that are beyond their resources and

⁴⁶ This Trust was established following the 1997/98 drought. Its governance structure includes the Hastings Mayor, the HBRC Chair, Federated Farmers and representatives of the horticultural, pastoral and banking sectors.

ability to manage. The Trust works very closely with the Ministry of Social Development (responsible for rural assistance), the various health services in the region, banks and consultants, all of whom work in a coordinated way to identify and support challenged families. Although each Trust operates differently, the message we received from both Hawke's Bay and North Canterbury is that Trust counsellors and coordinators are very highly respected.

It can be very difficult knowing when to declare a need for drought response activities, given uncertainty as to when rain will arrive. Experience is needed in monitoring pasture growth rates and stock feed requirements for alerts about the extent of the problem. This can be where community action makes a difference. Because they are such individualists and so used to making do on their own, many (male) farmers will not seek help for anything, either from partners or the Rural Support Trust.

The Rural Trusts do excellent work after a major climatic event, but they are not very effective at getting the message out to farmers who need help, before options close down.

Community 'woolshed' meetings (or their equivalent) are frequently cited as the trigger for alerting farmers to the need for action. Consultants, vets and rural support coordinators are trusted personnel who are in key positions to galvanise community action. The Rural Support Trust coordinators tend to be called on mostly when there is an adverse event, but are proactive at working with families at any time. They are very highly regarded, and are seen to do an excellent job which ranges from organising deliveries and vetting quality of donated hay and silage to ensure recipients are not further stressed, through to working with families in ways that leave them feeling empowered and in control of their next steps.

What really brings people together is adversity. For example, in the 2004 flood, the 2007 and later droughts, and so on, the Rural Trust acted as a catalyst for action and brought people together.

The holding of the Storm Damage Meeting for affected property holders was itself a signal of the CHB District Council and East Coast Rural Support Trust's action to deal with an adverse event quickly and effectively. The East Coast Rural Support Trust's action of getting the event listed as a medium scale adverse event meant that government funded Task Force Green assistance was available to help with cleaning up. The East Coast Rural Support Trust also organised a volunteer farm labour scheme to help with sowing grass and preparing for fence repairs.

The Canterbury District Health Board has been working with Christchurch City Council to develop, as part of the Greater Christchurch Urban Development Strategy an *Integrated Recovery Planning Guide* in partnership with the local district councils. Originally drafted in 2007 it has been updated to take account of the Christchurch earthquakes. It advocates for the 'thoughtful alignment of, and integration across, all planning groups' and applies the dimensions of health and well-being to integrated recovery planning. Community Resilience is a key theme. It has been well received and is being used by the North Canterbury Rural Support Trust.

Small-holders are a very large group, but because they are not dependent on the land for their primary income, they are not seen as the responsibility of Federated Farmers or of the Rural Support Trust when there is an adverse event. These people are "on their own".

Similarly little support is available for local non-farm rural business, yet these businesses can face the same challenges as farms during a drought or financial downturn. During the late '80s the combination of a financial downturn and drought had a severe impact on servicing communities such as Amberley⁴⁷. Some engineering operations only remained afloat by shedding all paid staff and radically reducing owner-operator drawings. The personal toll on families was serious. This is another area where it is useful for people to be aware of others' situations so that support can be provided.

Other professionals and rural organisations

Education and health professionals are regarded as critical to resilient rural communities.

Bring back country service to encourage professionals to work in rural communities (as the West Coast has recently done).

The Community Trusts have been a great way for identifying community needs and raising the money to make them happen – like the Oxford Community Trust's work to establish a community health centre. It still covers after hours when others don't.

Rural Women Inc has accepted the challenge of change, including climate change – the focus is on living well – economically, socially and personally. This means taking steps to reduce family violence and suicide. The organisation is quite political at the national level, but they check with the regions to find out what we think.

The fire brigade is an absolute lifeline. It's as important as the health centre because the fire brigade volunteers are called out to attend all the accidents on the State Highway.

FUTURE MEASURES TO MAINTAIN AND ENHANCE RESILIENCE

Building a holistic consensus approach

The North Canterbury Rural Support Trust coordinator reminded us that people have different strengths and skills, so that working together adds value, improves overall performance and enables new approaches to be identified. The young people felt that they had a greater ability and keenness than their parents to network across socio-economic and other cultural differences.

For tangata whenua the most critical action for building community resilience is bringing the two parts of the community together – Māori and non-Māori – so that each side has a better understanding of the other, and a better appreciation of each other's strengths. Some people consider there are too many entrenched, pre-conceived ideas. Some Māori feel cynical and marginalised by the non-Māori approach. They feel that to be resilient a community needs to meld together and work together. This is happening with concept work on a water storage dam in the district. All the stakeholders have been involved at the pre-feasibility stage to find a way to develop water storage without damaging the environment. By bringing everyone together it is possible to break down the barriers. The Canterbury Water Management Strategy has likewise adopted a holistic consensus approach.

⁴⁷ Dr Parnell Trost *personal communication*

Information sharing and provision of support

The timing and method of information-giving during and after an adverse event is seen to be critical if the information is to be heard and used. Some of the known immediate psychological impacts of traumatic experience (e.g., difficulty in dealing with complex information, benefits of taking action, need for empathy rather than detailed information) appeared to be at play for farmers in their varied reception to speakers at the CHB Storm Damage Meeting in the direct aftermath of the coastal flooding and landslips in April 2011. Receiving comprehensive information (no matter how relevant and even necessary) did not generate the same positive response as the talks giving empathetic, practical and simple step-by-step advice by farmers who had 'been there before'. Judging timing and nature of information-giving in terms of the likely trauma effects of an adverse event, and scheduling several public meetings interspersed with more one-on-one support (depending on resources and numbers affected) may give time to adjust and build resilience.

In dealing with events like droughts where there can be a long lead-up time prior to an event being recognised as such, community meetings to discuss the situation and the signs may help more people to take appropriate steps earlier. All the award winning farmers were planning years in advance to be better placed to cope with risks and deal with inevitable adverse events.

It was suggested that night classes (or their equivalent) would be beneficial for bringing people together and for providing farmers with options and alternatives:

Some farm business owners have the attitude that they lack skills to do anything other than farm. Night classes that were held in some districts for farm business owners have proven to be of great value in enabling the attendees to step back and look objectively at what they are doing and to recognise the breadth of their skill base.

Collective support in adverse event recovery

The advice of farm consultants, rural support and farming commentators alike is to do things collectively after an adverse event. Advice given at the 11 May 2011 Storm Damage Meeting in Waipukurau⁴⁸ was that: *'Farmers need to keep communicating with each other – with partners, family, friends, agencies, assisting services, and the bank'*. Advice to affected farmers was *'take someone you trust with you when assessing your property (as this is traumatic work and you'll see things you don't want to)'* and if both partners are involved on the property the advice was to *'get home help so that when you come in the house is warm, the food cooked, and get some sleep'*. Women were seen as *'better at seeing stress in their partners and making them do something about it'*.

This is not new advice. In 2007 CHB farmer and columnist Steve Wyn-Harris advised others affected by drought to recognise your own and others' stress, and *'keep the lines of communication open with family, staff, neighbours and mates'* (Steve Wyn-Harris *NZ Farmers Weekly* 04-06-2007). *'People need to be aware of who is struggling in their district and get in touch with the confidential rural support people being set up so we can avoid any unnecessary grief'* (Steve Wyn-Harris *NZ Farmers Weekly* 18-06-2007).

⁴⁸ The meeting followed the April floods and landslips over a 5km-wide strip of coastal land stretching from Cape Kidnappers to Porangahau. The slips and flooding took out stock, fences, roads and dams.

Community action

Action in preparing for and dealing with adverse events is believed to be best taken in partnership between the civil agencies, institutions and the community. This needs to include partnership in setting up processes for conversations where all people feel listened to, and for inclusive participation by the community in planning. There was considerable variation between communities and organisations with respect to the extent to which such processes were adopted. At present, while there were some excellent examples of consensus approaches there were also examples where organisations/planners and the community do not seem to be 'on the same page' in using such processes:

- There are differing views of effective decision-making in the community, whether the effectiveness is related to collective decision making or individual leadership;
- Yes, 'information is power' when it comes to resilience. However, in the provision and sharing of information about climate change and dealing with adverse events, the 'how' with which it is shared (including timing), and the 'who' (trusted and empathetic community members) is as important as the information content in empowering the community (i.e. taking account of community development principles);
- It may be useful in preparedness planning and in emergency response planning, for people to have information about the impacts of trauma on the capacity of people to absorb information, think and act (while North Canterbury Rural Support Trust had given its coordinators/counsellors some training in this, there is some variation between districts in how these Trusts operate and the resources available to them);
- All social, economic organisation/structural factors are felt to be important contributors to resilience, however, at the community level (i.e. one personal/family economic viability has been established) social factors are seen as by far the most important for all of the study communities;
- A strong shared sense of community identity is seen as an essential foundation for building other resilience factors. All three communities appear to be experiencing some feelings of loss of identity due to the recent and current accelerated change in many areas, and are seeking and adapting to new ways to build a wider community identity;
- Flexibility and adaptability are seen as important factors for resilience, but there are difficulties with the reality of these in practice, in view of perceived political, social and economic barriers;
- Community (and family), and institutional networking should be the focus in preparedness for adverse events. The specific content and purpose of such networking does not particularly matter – it's the networking itself which provides the long-term resilience;
- There was evidence of a strong and stoical community spirit in all three study areas, with people helping each other and working to support their community in an adverse event. However, to sustain wider community resilience in the long term, there is an expressed need to increase networking across and between different groups in the community. The sharing and openness expressed in the discussion groups indicated real willingness to move forward in this direction.

Structural shift in the way issues are managed

Local government

The current structure of local government is seen as not conducive to dealing with issues like climate change. It is felt to be beyond the capacity of most elected members of territorial and regional authorities to deal with the kinds of issues they should be confronting within the short time frame of their tenure. With a focus on reducing or holding the level of rates, and without clear advice from recognised experts, elected local government members cannot make the decisions that are needed.

Funding of action to resolve complex resource management issues dealt with by local government currently comes from rate payers. Outside urban areas 70-80% of the rating base is from farm families. Managing these resources well involves everyone and affects everyone – dealing effectively with environmental (e.g. water) and climate issues is a public good and should be addressed at the taxpayer level rather than by rates.

Under the current funding regime (rates) further amalgamation of the smallest councils may be necessary to provide the critical mass needed to handle the most complex and expensive issues. This will have implications (as with previous mergers of councils) for ensuring adequate representation of local people.

Environmental Court

It was suggested that it would be helpful if the Environmental Court adopted a more inquisitorial approach rather than the adversarial approach used now. This would enable issues to be looked at holistically and all stakeholders' perspectives explored.

Farm sector

Similar structural issues in the farming sector are believed to need consideration. For example, the ownership of water storage dams, water reticulation and irrigation schemes. When these were small, and easy to build, farmers financed and owned their water input. Corporate finance is now necessary for building this infrastructure.

Maintaining a sense of community

Numerous ideas were put forward about what the community could do to maintain the community, build resilience, and be prepared to deal with adverse events:

- Bring the different groups in the community together to talk about issues. 'Get the community together'. More networking, more face-to-face talks; '*Mobilise the doers*';
- Community groups need to get together on solving the small problems and issues; then when the 'big battles' arrive, they can easily be dealt with, as the networks, understandings and systems are already there;
- Build on schemes that provide good mentoring and community networking for young people (e.g. the CHB school mentoring scheme, and school visits to marae);
- Expand community events to increase a sense of community identity and confidence; these could be educational, social, or connected to business enterprises;

- *'Ultimately, it's what the people do that counts, it doesn't matter about structure';*
- Be aware of contemporary social values – in particular the value placed on technology; families and communities can make use of technology (e.g. Skype, internet, mobile phone) to build community networks – once this technology is accessible;
- Become involved in long term planning, and long term research where possible; do some more thinking and learning about long term effects of climate change.
- Shoulder tap people to volunteer and mentor newcomers to an organisation so they feel supported. (Many people who had made major contributions to their communities spoke of how they were asked to join an organisation and then six months later found they were running it)

What people said institutions/organisations/businesses could do:

- Diversify the sources of income in the community, to reduce economic vulnerability ('so that if the farms go, there's something else'). In CHB examples include: increasing the tourism opportunities, especially those related to farming such as Lamb Country branding, Silver Ferns open day initiatives, planning events like those proposed to showcase the region during the Rugby World Cup with 'from farm to the plate' information for outsiders. Such projects need to focus on differentiation (what have we got that no-one else has got?);
- Strengthen the town base; expand and increase the range of businesses, to create resilience through diversity, make the whole town attractive (e.g. in CHB deal with the eyesore of the old hospital building); this will increase community pride, which is seen as important for resilience in adverse times and hopefully attract more people;
- Strengthen understanding of and utilise the Walking Access Commission as an important venture for tourism and for community networks – 'helps people see beyond their current situation' with respect to adverse events, and seen as 'bridging the rural divide'. Also seen as creating wider networks, not just local community ones;
- Irrigation schemes are seen as a major opportunity for stabilising the community and economy – and stability is seen as a key resilience factor. To make the scheme workable for the community, there needs to be an alignment of economic, social, cultural and ecological aspects, and although that is seen as possible, a challenge is perceived with respect to finding the right ways to consult with the community, and ensuring the community has good access to information;
- Strengthen understanding of the wider picture, especially the relationships between the cities in the area, between town and farm, and between the strategic planning on different levels; provide more information on district planning.
- Ensure that the seat of decision-making remains with the communities who are affected by the decisions (especially in the light of the demise of community boards, and proposals for Council amalgamations) – the prospective amalgamation of council is seen as very positive by some as a move to efficiency and economic viability, but people question how that is to fit with principles of grass-roots decision-making.

- More provision of information around what people should actually do when caught up in adverse events, in short and medium term ('What if we're walking round the shops in town when something happens?'), and encourage people to use government resources to prepare in advance and discuss arrangements with their families.
- Students see themselves as a potential key conduit of important adverse events-related information, as they are able to feed information back to their respective families. They see that 'someone else' (local government?) should be responsible for generating the information, then passing to the school students to pass to their homes.
- There should be much more information provided by local government on dealing with adverse events, especially in paper based form (i.e. not vulnerable to power cuts) – i.e. mailed pamphlets, Council papers, and so on.
- The organisations that work 'on the ground' with people experiencing adverse events are seen as currently doing a good job, and people identify that their strength is in simple, practical organisation of help and advice (e.g. 'use the website Decision Tree' 'always work in pairs when assessing damage', accept whatever help is offered' 'take time off to socialise'): people are comfortable with the way they are working – more of the same appeared to be the message here.
- Retain and strengthen use of radio and landline use; these are considered crucial in emergencies where there may not be ability to use other technologies, and where provision of internet/fast broadband is inconsistent. Younger people, especially, feel that the community cannot rely on technology alone to communicate in times of need; and bring forward in time the intended installation of rural broadband – and make sure it is consistent across the community.
- Encourage continual re-evaluation of voluntary organisations to ensure they are relevant to their members and remain on target, and that there is a regular change of personnel to freshen ideas and retain focus and purpose. Despite this latter stance, there is also recognition that the effective, committed individuals and leaders who are driving local initiatives, also require support.
- A need was seen for better quality communication – and for people to meet 'others' (i.e. people outside their usual social circles). By talking, people build an understanding of each other's viewpoints, and resolve conflict. This also applies to national media representatives.

9. CONCLUSIONS

Variations in climate have the single greatest influence on year-to-year variations in New Zealand agricultural production...with global warming, climate is expected to change more rapidly than in the past, and it may vary more dramatically... farmers collectively have a lot of capacity to adapt to climate change. However, this adaptive capacity is qualified by a need for a more cooperative environment in which a strong sense of community is needed along with greater communication between farming and non-farming communities (Kenny and Fisher, 2003:2).

Framework of research and feedback

Participants consulted in this research were very helpful and open in contributing ideas. Although there was variation in the degree and levels of thinking around climate change, clearly much prior thinking had been done by people about the nature of their communities. They were therefore able to articulate a great number of ideas and examples related to community resilience. Overall, they had a strong sense of their own individual and community resilience, although alongside this was also a sense of community vulnerability and general anxiety about the future. (In this context, note our consistent conclusion below, that high vulnerability does not necessarily mean low resilience – the two are not mutually exclusive, although they may be perceived as so).

The case study community members all favoured a ‘social resilience’ definition and framework for approaching the resilience discussion. Such a framework is supported by both the literature (e.g. Ross *et al*'s synthesis⁴⁹) and by the strong weighting people gave to social factors in the detail of the community feedback (see below). In discussing definitions of ‘resilience’, they favoured the elements of ability to ‘bounce back’ and ‘anticipate change’⁵⁰. In discussing definitions of ‘community’ they placed most emphasis on the elements of ‘location’ and ‘social connection’ also noted by Bell and Newby (1971)⁵¹ as commonalities of definition in much of the literature. Such an emphasis also aligns with the strong sense of land and ‘place’ in both New Zealand Māori and non-Māori cultural history, and the high importance placed on social connection in rural areas (also a cultural element). So our participants appeared to define their community in terms of strong underlying social values.

We noted strong commonality in feedback from all case study communities and were thus able to assimilate and present the feedback information as a homogenous whole (with some exceptions noted along the way). The only significant difference in the case study feedback relates to the stronger cultural element in the Hawke’s Bay study, due to the higher profile of Māori in the CHB community and in the CHB focus group consultation. This particular case study area gave us some important extra material about cultural elements of resilience.

We also noted from the sector and case study community analyses that despite differences between case study area backgrounds, geography, land use, and priorities in projects, the underlying emerging socio-economic influencing factors (such as demographic patterns, and effects of social and economic change) were shared by all case study communities. Thus

⁴⁹ Ross *et al* 2010 - Chapter 4 p21; and see Vol 2 Background Paper VI p67

⁵⁰ As also noted by McIntosh *et al* (2008) see Vol 2 Background Paper VI p64

⁵¹ see Vol 2 Background Paper I p3

there was considerable homogeneity between case study areas through all aspects of the research.

In the feedback from focus groups, interviews and sector views there are a number of strong themes of community resilience that emerge. Most of these are also found in the key research identified in the literature. These themes (summarised below) all relate in some way or other to 'mainstream community, social, economic and cultural processes'⁵² in their effect on community resilience.

Change, adaptive capacity and community identity

Many in the case study communities are struggling to adapt to what is felt as profound social and community change over the last 30 years, at the same time as recognising some benefits in change. For example the isolation once experienced by the more remote rural communities is eroding with improved roading and communication technology. This same technology and roading access is making a major difference in how people run their lives, and bringing economic benefit (such as technology providing tools which are making a considerable difference to farm performance). However at the same time there has been a loss of key services and many local schools, shops, hospitals and post offices have closed down within a short span of peoples' memory. Not only do these close-downs limit access to transport for marginalised parts of the communities (such as the poor and elderly), they are also causing loss of community identity and a need for adjustment to markedly different ways of doing things. Especially significant is the loss of actual meeting places for the kinds of informal conversations that are held to be so important in building community relationships (note Ross's key indicator of 'people-place' for resilience⁵³).

There are also demographic and labour market changes. Criticism of young people not taking part in community and voluntary activities may not be taking account of the deep hollowing out of the population in rural areas generally, and the study areas in particular, for the ages 15-39 years and especially the group 20-34 years. Similarly the high level of reliance on volunteers is simultaneously being challenged by the declining availability of people with the time to volunteer. Where people are volunteering, supported by (often short-term) government grant funding, immeasurable value is brought to communities through the building of social capital and resilience as with, for example, the Oxford Community Trust, and the work of the Rural Support Trust coordinators. Strong volunteering ethos and capacity emerged as an important resilience factor in our research, and the widespread erosion of the volunteering sector is seen as a negative change factor in community resilience.

Thus the effect of change (social, political, economic) emerges as a strong influencing factor on perceived resilience in the communities. However, although some individuals may regard change in itself as a bad thing, it does not appear to be change in itself that is a negative or positive factor for resilience, but rather:

- (a) the rate of change
- (b) the duration of the change period
- (c) the question of how change is effected (whether imposed externally or evolves with community input)
- (d) the level of trust in change-makers, and
- (e) the capacity of a community to be flexible and adapt to change.

⁵² As identified in MAF's research questions

⁵³ Ross *et al* (2010) Chapter 4, p21; Vol 2 Background Paper VI p68

The latter includes individual and community ability to work through the process of loss and grief experienced wherever there is a long period of considerable change.

The impact of change on resilience must therefore be looked at in context of its enmeshment with other resilience factors. The presence of considerable mainstream economic and social change can certainly make a community vulnerable, but a number of examples emerged in the research to show that where there are other strong resilience factors in existence (particularly related to cultural community values, and high individual and community adaptive capacity) the level of resilience in the face of vulnerability can be very high.

Our findings of the significance of adaptive capacity on both psychological and practical levels are supported strongly by the findings in the literature (for example Ross *et al*'s key indicator of 'response capacity'⁵⁴, Lambert's comments on innovations in Maori communities⁵⁵, and Durie's analysis of Maori capacity for adaptation⁵⁶).

We noted in particular the significant connection between change and community identity. Retaining a strong sense of community identity was important to the case study communities (again relating to Ross's theory of 'people-place' connections and 'human-environment interdependencies'⁵⁷) and our findings as well as the literature suggest that where adaptive capacity is an inbuilt cultural value, and part of community identity, resilience can be strong, and change can be welcomed rather than feared.

Economics and resource factors

Adaptive capacity appears again as an important driving element in economic and resource contexts, as expressed in the concepts of diversity and innovation.

Our feedback from the case study communities showed that people felt strongly that a strong and viable economic base, good resourcing, stable succession structures and strong service infrastructure are key factors in strengthening resilience in rural communities. However, although these factors were often foremost in peoples' discussion, when we talked more deeply with people, heard what things were valued, and what projects were considered to be working well, we came to the conclusion that economic-related factors could certainly impact on peoples' individual and community actual and perceived vulnerability, but may in fact be over-rated as resilience factors. The presence of strong economic viability does not necessarily guarantee community resilience and neither does its absence preclude the existence of strong community resilience. Again, it is the response of the community (both psychological and practical) that counts, and where rural communities intrinsically support principles of diversity and innovation in their economy and infrastructure, resilience is present (this is also found in the literature, such as Ross *et al*⁵⁸, and Hegney *et al*⁵⁹).

Once again, adaptability emerges here as a key resilience factor. Economic diversity and innovation is seen as key to the ability to adapt to unexpected economic change. In addition, if the community has some feeling of power over its own economic fate and well-being (e.g. through local government community consultations and community-business partnerships etc)

⁵⁴ Ross *et al* 2010, Chapter 4, p21, and Vol 2 Background Paper VI pp67-68

⁵⁵ Lambert 2008, Chapter 4, p21, and Vol 2 Background Paper VI pp69-70

⁵⁶ Durie 2005, Chapter 4, p21 and Vol 2 Background Paper VI p69

⁵⁷ Ross *et al* 2010, Chapter 4, p21 and Vol 2 Background Paper VI p67

⁵⁸ Ross *et al* 2010, Chapter 4, p21 and Vol 2 Background Paper VI p68

⁵⁹ Hegney *et al* 2008, Chapter 4, p22 and Vol 2 Background Paper VI p72

such empowerment increases a sense of confidence and ability to cope (matching discussion in the literature on 'self-efficacy'⁶⁰). Thus the existence of other underlying factors (largely related to social values and structures and community power of influence – see below) is more important.

Changes in farm structure

Farming is an area which continues to be particularly affected by the factors of change, economic viability and service structure. In addition, the farming context raises issues of succession structure, which emerged as another area of vulnerability in the case study areas.

The research suggests that the structure of family farming may change as farmers grapple with the pros and cons of carrying on/leaving farming and what impact this will have on business succession, as well as correctly judging the timeframe as to when they should leave the business. Alongside all the other expenses required in this high risk business of farming, a concern was expressed that sheep farming is becoming too expensive for individual families. The result is likely to be resident farm managers who are not owners. The concern is that managers have different motivation from owners and are also less integrated into the farm community. This has already been seen in the dairy sector. There are growing concerns that there are fewer people available to run school committees, the volunteer fire brigade, catchment committees, and flood protection activities. On the other hand the Ballance Environmental Farm Awards show that managers can be just as adept as owners at effective environmental management.

Farmers are also thinking in terms of scale. This could mean getting bigger (buying more land), or going more intensive on the same land. They are thinking about changing the type of production or diversifying and broadening their economic base, and what impact those decisions will have on succession.

The broader the economic base away from the community's reliance on dryland sheep/beef farming, to a wider economic base which includes irrigation and dairying, tourism and other activities, the more resilient the community. The principle of adaptive capacity (through diversity) is again reinforced.

Connectedness and social networks

Social connectedness emerged in the research as the overwhelming key contributor to resilience. It appears to be a necessary underlying 'enabling' factor for all other resilience factors to come into play. A number of discussions emerge in considering this factor:

- There was concern throughout the case study research, and expressed also in sector interviews, about the noticeable weakening of community networks in rural areas, and the negative effects that this may have on the community's ability to respond in the face of adversity. Socio-economic and demographic change has meant that it is now more difficult for communities to maintain stable social networks, and people talked to us frequently of their experience of social fragmentation, and poor communication between different parts of communities. (This is not necessarily a new thing in itself, but the more transient population reinforces the problem). There are geographic, structural and social barriers to engaging, and there are changing cultural norms about where and how people socialise. These tend to culminate in attitudes of 'them and us'

⁶⁰ For example, Paton, Chapter 4 p23, and Vol 2 Background Paper VI pp75-78

which sometimes drive wedges between groups, and conversely sometimes add interesting opportunities for diversity and new ways of thinking and doing. The formation of 'silo' social groups within a community can cause fragmentation and conflict which can weaken communities and make them vulnerable to adversity. Understanding the diversity in and characteristics of a community, and finding ways to overcome the 'them and us' attitudes, is part of the process of rural communities becoming resilient in the face of climate change;

- On a more positive note, the research suggests that where strong social networks do exist, and are positively reinforced, then such networks are the key to coping in any sort of adverse event. We might further conclude that the value of specific content-based preparation for disaster and change may be over-rated; in other words, if the social networks are there, no matter what happens, the community has an inbuilt structure and communications network which can immediately be brought into action.
- Preparation and planning was given a high profile in the field research (particularly by those involved more formally in planning and policy work areas), and is given significant weight in the community resilience and disaster-response literature. It is noticeably a concern for those areas of the communities which already are vulnerable and lacking in social networks (such as the elderly) or information networks (such as the school children). However we found a contrast between the high level of energy and awareness being put into climate change awareness and preparation by planners and policy makers and academics, that was in general not matched by people at 'grass roots' level. In the field research there was a range of opinion on the value of preparation and planning, and whether this was seen as a positive factor or not seemed to depend on peoples' levels of trust in the 'planners', their historical experience of planning processes, and their own feeling of self-efficacy. Other underlying resilience factors would seem to be at play. Many in the communities felt that if you get the social networks right, you will have the *intrinsic* ability to 'bounce back' and 'anticipate change', and that this precludes the need for formal planning.

Even while many recognise the importance of preparedness and planning and preparation for isolated adverse events (see case study feedback), social connectedness is still seen as the necessary underlying 'enabler' for resilience in the longer term. Thus those involved in formal planning and policy making may need to rethink the basic premises of their work, not just the ways in which they seek engagement of communities in awareness, preparation and planning.

- The case study feedback and increasingly the sector views, show that where planning and decision-making processes are established in partnership with the community affected by those decisions, resilience is built. Community decision making rather than individual decision-making is seen as critical. Again, this is supported in the literature (e.g. McIntosh's discussion on the emergence of resilience as 'bottom up' rather than designed 'top down'⁶¹, Paton's principle of community-led decision-making⁶², and Ashton and Thorn's emphasis on community decision-making⁶³).

⁶¹ McIntosh *et al* 2008, Vol 2 Background Paper VI p72

⁶² Paton 2007 Vol 2 Background Paper VI p76

⁶³ Ashton and Thorns 2007 Vol 2 Background Paper VI p66

- Although individual self-efficacy (as described by Paton⁶⁴ among others), and individual qualities such as positive outlook and perseverance did appear as factors in community resilience⁶⁵, our research showed that *community* self-efficacy and collective capacity were given much greater value by the study communities. Although some of the literature supports this collective emphasis in general we found a greater emphasis in the literature on the individual than the collective, in terms of resilience. It may well be that the collective values and principles of consensual decision-making are more integrated into New Zealand society through the influence of Māori (and it is notable that the Māori literature makes a strong contribution to discussion of shared values, social networking and social connectedness in general⁶⁶).
- The community capacity for a strong volunteering sector has already been mentioned above. It is clearly a driver for social connectedness, and it is interesting that this factor has also been clearly identified in the literature as an important component for building social networks to increase community resilience (e.g. see Hegney *et al*⁶⁷).
- The field research identified an integrated approach to challenges and decision-making as an important resilience factor. Such an approach involves collaborative processes which reinforce cross-community networks, a sense of community belonging and identity, and increased community power over community outcomes. This principle has also been found to be a key factor in the literature (e.g. the Harnsworth and Warmenhoven study in recommending greater collaboration between agencies, iwi and hapū and central government⁶⁸, King's comment connecting vulnerability in Māori communities to 'inequitable empowerment and representation in local, regional and central government'⁶⁹, and Putnam's theories of 'bridging' and 'linking' social capital⁷⁰).

The research showed that the principle of an integrated approach is widely present in theory and policy, for example. in Council and organisational policies. However, it seems that this is a difficult principle to put into practice. In particular, some of those involved in planning, consulting, and implementing policy understood the need to bring all stakeholders around the table, but perhaps needed more support in gaining skills to do so, and to facilitate difficult cross-group meetings, particularly in a large community consultation. Conducting community consultations through already established social networks, and by spending time on building genuine relationships, is likely to be an effective approach.

Recognising the range of adversity to which rural communities are subject

Rural people in this study did not think about climate change or adverse events in just environmental terms. The changes seen to have the most fundamental impact are social: hospitals closing, lack of high speed broadband access, and empowering young people to manage their own issues in an effective way.

⁶⁴ See Vol 2 Background Paper VI pp75-78

⁶⁵ And in the literature, e.g. Hegney *et al* 2008 Vol 2 Background Paper VI p73

⁶⁶ For example Lambert 2008, Vol 2 Background Paper VI p69; King *et al* 2010 Vol 2 Background Paper VI p71; Adams 2008 2 Background Paper VI p69

⁶⁷ Hegney *et al*, 2008: Vol 2 Background Paper VI p72

⁶⁸ Harnsworth and Warmenhoven 2003: Vol 2 Background Paper VI p70

⁶⁹ King *et al* 2010, Vol 2 Background Paper VI p71

⁷⁰ Sinner *et al* 2005, Robinson 1997 Vol 2 Background Paper VI p65

Schools are especially important, and there is always fear of losing these essential community hubs. People are connected through the school and there is always a drawing in of support. People and families who met through the school keep an eye on each other, and keep in touch often for years afterwards.

Communication (through landlines, cell phones and broadband) is essential whether for the normal business of farming, or in adverse events. For dairy farmers it means knowing the latest prices. For any livestock farmer it's being able to access critical information on management and production. Security of consistent coverage is crucial in an adverse event. For example, during the 2004 floods in CHB bridges were washed out, landlines came down and without cell-phone coverage people were unable to contact others for help.

Understanding the diversity within communities, but also understanding that social impacts appear to matter most to all people in all groups (whether in the context of gradual change or immediate adverse events), is necessary in approaches to climate change issues.

Water

Despite the preponderance of social factors, one tangible resource – water – emerged as a major issue for all three study communities. For example, when the Amuri Plains irrigation scheme was constructed in the late 1970s-early 80s, it was generally welcomed as a dream come true by the community. The economic growth and stability which the irrigation scheme introduced has seen an increase in the population and resource base of Culverden and other local settlements.

Dealing with adverse events

Community members are effective in coping with adverse events when they know what to do, have worked together for a long time, value teamwork, and function as a group which values collective efficacy in serving their community. The study highlighted the multidimensional nature of community resilience.

Resilient communities have the capacity to adapt to challenges by using networks of resources that may be economic, social, and/or informational (Wyche *et al* 2011). The information and ideas provided by the members of the case study communities was in accord with the eight domains of resilience identified by Paton (2007) in the context of disaster management. Following this approach, resilient communities can be seen to be characterised by:

- connectedness, commitment, and shared values among community members
- participation by community members in the affairs of the community
- support and nurturance of the needs of community members
- the engagement by community members in critical reflection, problem solving, and skill building
- active communication
- the ability to utilise and obtain resources
- a structure of roles and responsibilities for leaders and organisations
- consensus approaches
- managing issues in an integrated way.

The study showed that the goals of community resilience when dealing with adverse events need to be broad enough to meet various community needs and include effective problem

solving, interagency relationships, resource acquisition, policy development and implementation, and communication.

Approach

Community ownership and self-reliance is assisted by involving all parts of the community in plans and solutions in a facilitated but systematic way, giving time for deliberation and taking account of the range of perspectives. None of the communities responded well to 'leaders from the outside' telling them what to do, or how they should participate in decision-making.

Consistent with the challenge from all three rural communities to involve all parts of the community in problem solving in an appropriate way, is work undertaken by Landcare NZ (Atkinson et al 2009). Landcare's premise is that a key skill to building resilience to respond and adapt to the challenges of major change is the ability of communities to have different types of conversations.

Through an integrated catchment management research programme in Motueka, Atkinson et al found that when they tapped into the locals' wealth of knowledge about connectivity to place, expressions of care and responsibility, and understanding of the social and biophysical fabric of the area, the resulting conversations brought together the knowledge and experience of different sectors of the community. The authors concluded that how these conversations were held 'made the difference' in resilience building: in sharing information, in building understanding, in encouraging thinking, in recognising opportunities, and finding innovative solutions. The outcome of the project was an improved understanding of people's cultural identity with land and river, and the differing ways people care for their environment and community. This is the kind of empowering approach that rural case study communities are looking for.

The bottom line, as the Amuri Dairy Employers have shown, is doing the right thing to try and ensure everyone in the community is included.

Actions being taken to adapt to climate change

In general, there was an avoidance of consideration of climate change as an issue by those other than planners and policy makers, and the term was barely used at focus group meetings except where the facilitators introduced the concept. It was also not noticeably used in the storm damage farmers' meeting. There seemed to be a preference to regard all adverse events as isolated incidents, even where there was an acknowledged pattern of change.

The farming community and council planners appear to have some differing views about how to handle adverse events. The planners are keen for farmers and other segments of the rural communities to become engaged in long term planning and preparedness. As stated above, there are mixed messages from rural communities about whether or not they need to plan, and what the time scale for planning should be.

Many farmers are keenly aware of the need to be environmentally sensitive, socially responsible and economically viable, and have taken steps to ensure their farm practices reflect this approach. Award winning farmers all recognised the need to plan many years in advance and are following this approach.

There were definite distinctions between how communities themselves handle the issues that confront them. Some members of the study communities did not seem to think they needed to

plan. They believe that they will know what to do when the time comes (farmers), or that someone else will take charge (young people). Problems created by these different views (and the possible underlying anxieties) need to be addressed.

Some things to do

Along with suggestions already noted by case study participants in chapter 8, the following are additional principles and actions that the research suggests will encourage and sustain community resilience:

- Establish functional and active linkages with communities to listen and understand their needs.
- Empower local agencies e.g. local government to manage interventions.
- Allow communities to lead the process to manage and solve any issues or problems.
- Recognise rural communities are different – and need different approaches in relation to government regulations such as Occupational Health and Safety measures.
- Respect the existing community support systems, networks and leaders as being essential for communities' resilience.
- Overcome the silo mentality and avoid compartmentalising. Planning needs to be integrated to ensure all perspectives are taken into account and the best possible effort made to understanding the consequences of decisions for every sector.
- Ensure decisions are made with genuine and effective consultation and an understanding of the local context.
- Listen to the voice of young people. Work to increase their levels of information and confidence, by creating programs and partnerships within and with schools.
- Be mindful of the impact of removing infrastructure such as schools, medical services and so on from communities, and the very real benefits of supporting provision of social and work hubs to strengthen community networks.
- Recognise and understand the psychological impact of change on individuals and their community.
- Ensure provision of group facilitation skills and community consultation skills for all people involved in working with community projects. Where external facilitators are used for community projects, structure their involvement so that they are working in partnership with community members.
- When providing information and advice on climate change, deliver that information via members of the community (i.e. advice about farming should be given by hands-on farmers, advice about coping with floods should be delivered by those who have experienced dealing with floods themselves).
- Adopt a principle of 'building bridges not walls' when working in communities.
- Establish relationships within the community before attempting to make changes. Sustain those relationships.
- Encourage trust building, by following through on undertakings, asking what's needed rather than 'telling', and ensuring a reciprocal balance of 'give and take' in all transactions with the community.

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APPENDIX A: GLOSSARY AND ABBREVIATIONS

AgITO	Agriculture Industry Training Organisation
ANZSIC	Australian and New Zealand Standard Industrial Classification, first published in 1993 (replacing NZSIC), revised in 1996
CDEM	Civil Defence and Emergency Management
CHB	Central Hawke's Bay
DIA	Department of Internal Affairs
DC	District Council
Ecan	Environment Canterbury (Canterbury Regional Council)
ha	hectare
Hapū	subgroup of the main tribe, extended family group with a common ancestor
HBRC	Hawke's Bay Regional Council
HDC	Hurunui District Council
Hui	a meeting or gathering together of people
IPCC	Intergovernmental Panel on Climate Change
Iwi	tribal group
Kaitiakitanga	traditional guardianship – the active protection and responsibility for natural and physical resources by tangata whenua
Kaiawhina	local Māori social service community and educational workers
LGNZ	Local Government New Zealand
LTCCP	Long Term Council Community Plan
Mana	status or prestige, influence or power to enable purposeful achievement (such as enhancement of wellbeing)
Marae	traditional meeting place, village assembly ground
MAF	Ministry of Agriculture and Fisheries (to 1995), Ministry of Agriculture (1995–1998), Ministry of Agriculture and Forestry (1998-)
NIWA	National Institute of Water and Atmospheric Research
NZSIC	New Zealand Standard Industrial Classification – first published in 1970, revised in 1975 and 1987 and replaced in 1993 by ANZSIC
Pā	fortified village
primary industry	agriculture, forestry, fishing, and mining
Rangatiratanga	chieftainship/sovereignty, self-determination
RMA	Resource Management Act 1991
Rūnanga	an assembly, tribal council
Taiwhenua	land, district, permanent abode
Takiwa	district, space
Tangata whenua	people who belong to a particular place/people of the marae
Tino rangatiratanga	the right of Māori to define for themselves how things should be
Turangawaewae	'place to stand' – the situational identity, through genealogy or association, that provides a home base on the marae and enables a person to say 'I belong'
WDC	Waimakariri District Council
Whānau	family
Whānui	descendants

APPENDIX B: DEFINITIONS

Urban areas or All urban	Centres with 1,000 or more people
Main urban areas	Centres with 30,000 or more people
Secondary urban	Centres with 10,000 to <30,000 people
Minor urban areas	Centres with a population of 1,000 to <10,000
Rural centres	Centres of between 300 and 999 people
Rural districts	Areas outside population centres of 300 or more people
Rural areas or All rural	Areas outside population centres of 1,000 or more people
Rural residential	0.5<2 ha
Small holdings	2-8 ha