

Shared experiences: the basis for a cooperative approach to identifying and implementing more sustainable land management practices

Allen, W.J. & Bosch, O.J.H.

Manaaki Whenua - Landcare Research, PO Box 69, Lincoln, New Zealand

[Source: Proceedings of Symposium "Resource Management: Issues, Visions, Practice "Lincoln University, New Zealand, 5-8 July, 1996 pp. 1-10]

Abstract: Given the complexity and different social perceptions surrounding many resource management issues, the challenge facing science is to develop understanding, knowledge, forums and learning environments to better inform and support more sustainable decision-making. An essential component of any process to achieve these aims will focus on placing contributed information "in context". This paper describes the importance of community dialogue processes to support the identification and adoption of more sustainable land management. The benefits of a cooperative approach the planning of different sectors of society towards a more coordinated set of environmental goals are outlined.

Introduction

Over the past decade, the challenges facing those who have the responsibility for making sound resource management decisions have multiplied. The underlying concept of resource management is influenced by a pragmatic recognition of the worldwide trend towards a more holistic, multi-use, multi-value view of the wider environment. Within this broader context, science and technology should be seen as providing means to achieve ends that are continually redefined by major social concerns. These challenges, in turn, provide the basis for a new era in research and development (R&D;), whereby scientists, land managers, policy makers and other interested parties can learn together how best to manage our natural resources in a sustainable manner.

This paper begins by arguing that the links between science and management have become increasingly strained over the past two centuries. The changing eras of land use in New Zealand are discussed in the context of their implications for research and development. A community-based research framework is outlined which provides more opportunity for land managers (farmers, conservators, etc.) and scientists to share the benefits of their experiences and observations. The manner in which this cooperative approach emphasises the importance of community dialogue processes to support the identification and adoption of more sustainable land management practices is described. The paper concludes by documenting some of the lessons learnt from the implementation of this research initiative in the South Island high country.

Changing perspectives

As Ruckelshaus (1989) points out, sustainability was the original economy of our species. "Pre-industrial peoples lived sustainably out of necessity; if they did not, if they expanded their populations beyond their available resource base, sooner or later they starved or had to migrate. The sustainability of their way of life was maintained by a particular consciousness of nature. These

peoples were spiritually connected to the animals and plants on which they subsisted - they were an integral part of the landscape, not set apart as masters."

Without wishing to romanticise the outcomes of pre-industrial land management, or imply that preindustrial people were always good ecologists, it is possible to see many of their practices and value systems as providing models/lessons that could benefit us today. The important point here is not whether our pre-industrial ancestors made mistakes or not - they undoubtedly did - but rather, whether those that practised land management were able to learn from those mistakes. For these people, local knowledge and scientific knowledge were the same thing. Their conventional, or operational, ecological wisdom evolved in response to lessons learnt from land management, which in turn was strongly embedded in tradition and spirituality. For these traditional peoples their resource management practices were part of and indistinguishable from their culture. Moreover, because their land-management systems were small and relatively autonomous they tended to provide an ideal learning environment: what worked, what didn't, and how the different sub-systems linked together.

Perhaps not surprisingly, with the emergence over the past 200 years of our current urban and industrial society there has been a corresponding cultural lag in ecological wisdom. At the same time, our science knowledge has become increasingly divorced from local knowledge. This lag in our operational ecological wisdom was publicly acknowledged in the 1960s, and made popular by authors such as Rachel Carson in *The Silent Spring* (1962). Indeed, only two centuries ago, our collective power to transform the environment was relatively local and contained. The sheer magnitude of the earth - given that it took a year to go round it in the best of ships - must in itself have seemed adequate to insure that our transformations were limited.

Today, all that has changed and the accelerating power of science and technology has radically transformed the face of our planet - for good and for bad. More than half the world's population is now urbanised. Polio and other diseases have been defeated. Artificial fertilizers simultaneously ensure high-yielding crops, and threaten water quality. We have transcended the bonds of gravity and the limited vision of the past to venture into outer space. And along the way we have reshaped nature itself. These changes to natural resource systems, characterised by major environmental change since European settlement, are easily visible in countries such as New Zealand and Australia.

While changing land use practices and management may appear a daunting task, we should remember that it is something that happens quite regularly in response to different societal concerns and aspirations. Indeed, so marked are these changes in many rural areas that it seems reasonable to suggest that there have been a number of different eras of land management, each dominated by a different way of seeing the world (Bawden, 1987). These different eras are outlined in Figure 1 as they relate to the South Island high country.

Each era is characterised by the way in which people view land management, and thus the way they practice and research it. However, as Bawden points out, the issue is more complicated than it appears, in two ways. Each perspective complements rather than replaces its predecessors, making for increased complexity. And with the addition of each new perspective, the number of parties with an interest in the management of these lands also increases, making for even more uncertainty or ambiguity. For most of this century scientists working in the New Zealand high country were at least confident in the knowledge that they were researching aspects of what was generally regarded as a largely extensive pastoral system. Today, there is a pragmatic recognition of the worldwide trend towards a more holistic, multi-use, multi-value view of the rangelands. And whether that is an

agricultural, tourism or conservation system, or some combination of all these, is increasingly undefined and debated.

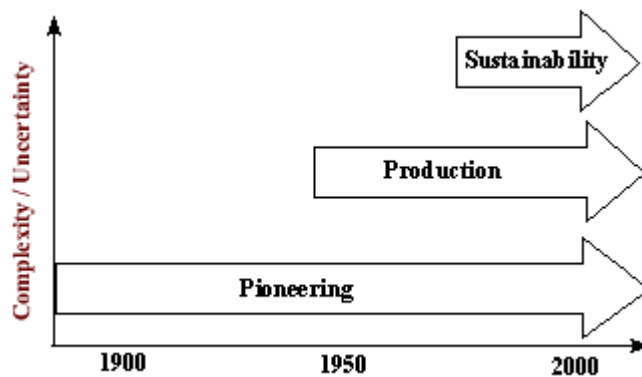


Figure 1: Changing eras of land use in the South Island high country of New Zealand (Adapted from Bawden 1987)

The eras of Pioneering and Production were characterised by an emphasis on components of farming and other resource management systems, rather than on the systems themselves. The concern was for "fixing up" the less effective parts, rather than inquiring into the nature of the relationships between the parts (Bawden, 1987). Intuitively, of course, few people would deny that we live in a finite and interconnected world in which physical, biological, social and environmental phenomena are all evolving interdependently. As we no longer live in small, relatively autonomous land management units, however, we have little choice but to reduce it to smaller pieces which we can examine separately. Accordingly, our perspective and knowledge of the world is necessarily divided into different subjects (or disciplines), and these change as our knowledge changes.

However, because our education and science is based on this division into distinct subjects, it is easy to forget that these divisions are man-made and arbitrary. Indeed, as Checkland (1981) observes, "it is not nature which divides itself up into physics, biology, psychology, economics, sociology, etc., it is we who impose these divisions on nature. And these divisions become so ingrained in our thinking that, the power of reductionist science aside, it is not surprising that we find it hard to see the unity that underlies the divisions".

And so in this current age of sustainability, even while we continue to become more and more technologically proficient, our ignorance about the nature of what we are doing becomes increasingly apparent. In the grassland component of the high country of New Zealand's South Island, science has provided much of the knowledge and technological advancement required to improve rangeland productivity. And in this, as Figure 2 clearly shows, it has been successful. Given knowledge and technology backed by public support in the form of incentives and subsidies, high country productivity measured by stock units/hectare increased significantly. However, in the age of sustainability the questions are different! Today we have farmers that publicly question whether they are farming "sustainably" and challenge science to define the land management practices that need to be implemented to be "sustainable". And as we grapple with those challenges and what they mean, it appears we need new ways of looking at the world and integrating management and research.

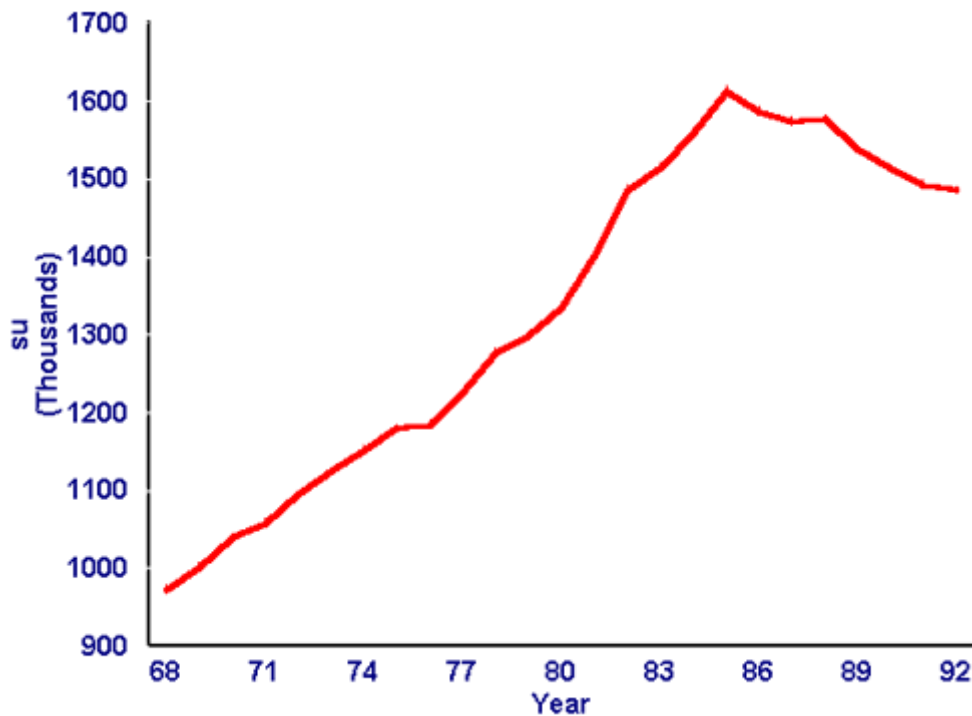


Figure 2: Stock unit changes on 187 high country leasehold properties between 1968 and 1992

In general, taking a given system to be considered, we seem to have a good track record in improving performance - measured against narrow economic or productivity criteria. However, when the questions are broadened to evaluate the health of relevant systems not only in terms of economics, but also in terms of ecology, ethics and equity - some glaring gaps in our knowledge and methodologies are exposed. In the age of sustainability we are concerned with the interface between natural and social environments. In turn, this requires us to deal with subjective debate and conflict because of the increase in complexity, uncertainty of purpose, and ambiguity in interpretation over the systems we are dealing with.

Integrated System for Knowledge Management (ISKM)

ISKM is an approach designed to support an ongoing process of constructive community dialogue and to provide practical resource management decision support for land managers and policy makers (Allen et al. 1995; Bosch et al. 1995, 1996). This framework is currently being used in the South Island high country of New Zealand to help communities (policy makers, land managers and other interest groups) share their experiences and observations to develop the knowledge needed to support sound resource management decision-making. Accordingly, it brings fragmented local and scientific knowledge systems together into a single, accessible focal point. Facilitated community dialogue processes are used to structure this knowledge and information providing decision support appropriate for different levels (e.g. site, catchment, region). This approach recognises that natural resource management is increasingly characterised by apparently conflicting social perspectives and emphasises processes to provide those involved with a better understanding of other points of view.

The focus of the ISKM framework (Figure 1) is to provide an organised set of principles (methodology) which will guide our actions as we go about "managing" real-world problem situations. It builds on principles of experiential learning and systems thinking, and is applicable to developing the knowledge and action needed to change real situations constructively. In practice,

the process is cyclical and highly iterative with many steps likely to be carried out simultaneously. There are also numerous entry points. The framework can, however, be usefully viewed as having two distinct phases, as illustrated below:

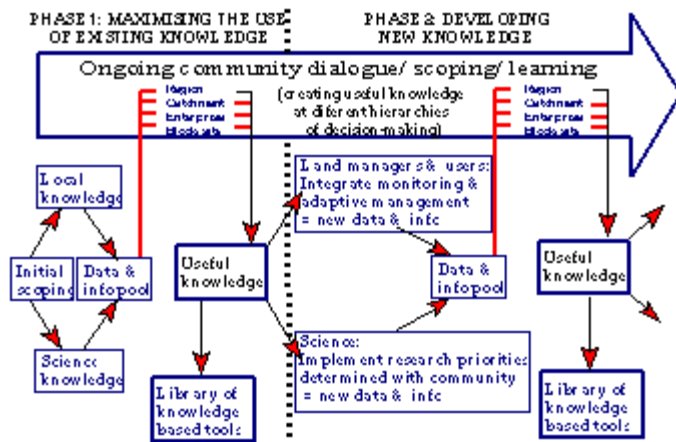


Figure 3: ISKM - a participatory research framework to facilitate the identification and introduction of more sustainable land management practices (Source: Allen et al. 1995; Bosch et al. 1996)

Maximising the use of existing knowledge through community dialogue

The first phase of the approach emphasises developing a common understanding of any perceived issue or problem. This entails an initial scoping process to define clearly the nature of the system under consideration, and the needs and opportunities facing the different interest groups that may be involved.

Because this involves all interested parties in the research process from the outset, it is more likely to lead to the development of opportunities and outcomes relevant to community needs. It provides a basis for the design of appropriate processes (interviews, focus groups, questionnaires, etc.) to unlock and access the relevant existing data and information from both local and research communities. This information is then brought together in a central data and information pool and structured to allow its sharing and evaluation by all those concerned.

Just as this process encourages those involved to set clear goals and objectives, so it provides a sound basis for the development of useful and user-friendly tools to enable land managers to monitor and interpret the outcomes of their management actions (Gibson et al. 1995). In turn, the process supports the successful implementation of relevant monitoring programmes as land managers become involved in the interlinked processes of monitoring and adaptive management.

Improving communication flows

Given the complexity and different social perceptions of many agricultural and environmental situations, the process actively supports improved communication flows among all those involved to develop the "useful knowledge" needed to provide practical decision support.

Facilitated workshops provide a learning environment within which participants develop a shared understanding of how others see the world and how that shapes the way they act in it (e.g. manage their land, carry out their research, develop policy). Importantly, the process recognises the contextual nature of information. A strategy or goal suggested by a farmer, policy maker or environmental group will always have been derived from within a particular social, economic and ecological setting. Scientific results are similarly derived from a particular context, which will include

factors such as scale, site and the researcher's personal worldview. Accordingly, the community dialogue process is designed to seek the active cooperation of participants in developing a common understanding of the context in which any individual piece of information becomes relevant.

Generating useful knowledge

The ongoing community dialogue is designed to produce useful knowledge to help all those involved in the process. It achieves this in a number of ways:

- It provides those who participated in the process with immediate access to new ideas and perspectives which may help them re-evaluate their current management or policy strategies. At the same time, it helps develop a shared understanding which can reduce the level of conflict that currently surrounds many resource management issues.
- It automatically aids the identification of new and relevant research initiatives as knowledge gaps are identified. Importantly, these activities also provide farmers, conservators, policy makers and others with the opportunity to provide researchers with a greater appreciation of their information and technical needs.
- It also provides the community with the resources necessary to develop a structured library of knowledge-based tools, providing support for monitoring, interpretation and management, that is relevant to the needs of decision-makers, and consequently more likely to gain their acceptance.

Developing new knowledge: an ongoing process

Importantly, the ISKM framework allows the substance and context of the required information flows to be updated as more knowledge becomes available, and different goals can be set. As land managers and policy makers adopt new strategies and measure the results of their actions (formally adopting the linked concepts of monitoring and adaptive management), they will continually gain new information that can be shared with scientists, policy makers and others. In a similar way the ongoing flow of new data and information from science activities can again be shared with decision-makers.

The process is thus iterative, with each repetition serving to maximise the knowledge available at any time to support decision-making by those in the community. The addition of different modules and issues will arise from the need to meet a community objective, which may be financial, ecological or social, or some combination of these. As those involved cooperate to develop the necessary knowledge and knowledge-based tools, new issues will be raised and the process expanded.

Learning the lessons

As this paper has argued, involving the community in participatory research is essential if sustainable land management issues are to be resolved in a constructive and cooperative manner. It is increasingly becoming recognised that the way we "see" the world, determines what we "do" to it (e.g. Maturana & Varela, 1972; Bawden et al. 1985; Ison, 1993). If we are to develop a cooperative approach then it is important for scientists, policy makers, land managers and other interest groups to share their experiences and so discover new ways of looking at the world. Against this background, ISKM represents an approach which attempts to provide the necessary learning environments enabling all those involved to develop a more holistic perspective of sustainable land management, within which they can best make their particular contribution.

In the South Island high country the ISKM framework was initially used to help the community find practical land management strategies to address the problem of an invasive weed, *Hieracium* spp.. But, using this approach to look at the problem from the point of view of management also highlights how ecological, social and economic issues are inexorably linked. No-one manages for *Hieracium* alone. For example, farmers are primarily concerned with managing for goals such as increased stock production or available forage supply, while conservators will place an emphasis on management to protect a particular species or threatened ecosystem. Both these groups will also be concerned with other issues such as watershed and landscape management. Accordingly, the ISKM process is now being used in the high country to address a number of related issues such as conservation, grazing management, burning and water quality.

As we bring different knowledge systems together through this process, it becomes clear that what you look for is what you get. As Chris Argyris (1985) and his colleagues point out, depending on the community in which they operate, each different interest group will look for different facts and solutions in accord with their own set of norms for inquiry. For example, we find scientists concentrating on determining the effects of grazing on *Hieracium* (describing and accounting for some phenomenon). In contrast, farmers ask more focused questions such as the effects of different grazing regimes (rotational grazing vs set stocking, different grazing intensities and frequencies, etc.), and are concerned with applying the answers to real-life contexts "amidst all the complexity and multiple dilemmas of values they pose" (Argyris et al. 1985). In issues relating to conservation in the high country, conservators often place a high priority on protecting individual species - such as a rare lizard, while when farmers are asked to list conservation issues in order of importance it is unlikely that a lizard will even feature.

These examples show how better communication processes could help different groups in their quest for sustainable resource management, by: i) developing a shared understanding which would reduce unnecessary conflict, ii) generating useful ideas which are more likely to be adopted and applied, and iii) identifying relevant research opportunities.

Much of the apparent conflict surrounding many resource management issues relates to the fact that different interest groups fail to appreciate the perspectives and values inherent in the actions of others. If these groups can be encouraged to share their experiences and viewpoints there will be a greater understanding of why these differences exist. In the example provided above, it may be unlikely that farmers will ever regard a lizard as an important component of a farming system. However, through improved communication they will develop an appreciation of why conservators are concerned with a decrease in the population of this particular lizard. Equally important, the more active involvement of groups with different perspectives, such as farmers in a conservation issue, may well provide useful ideas and strategies that lie outside the normal perspective of those with the primary responsibility for managing any particular resource.

Collaboratively developing new management options and strategies in this way is one of the biggest advantages of participatory ventures. Participatory research provides all interested parties with the opportunity to learn from the experiences gained within enterprise and catchment-level systems. This provides all those involved with an appreciation of management concerns and issues, and allows groups such as scientists and policy makers a better feeling of how their contributions fit into the total system. The result of such cooperation automatically leads to the design of relevant research that will directly benefit both land managers and policy makers.

However, closer collaboration and better understanding of different perspectives can only be achieved if we take the time to develop a common language. For example, in developing

management strategies to reduce or avoid Hieracium invasion it became clear that the amount of Hieracium currently present in any particular area is an important factor to be considered. The problem was that individual descriptions of Hieracium spread and abundance differed according to plant communities. Rephrasing this question to account for the "stage of invasion" rather than "spread and abundance" provided all those involved with a common concept (language) applicable to Hieracium dynamics in most plant communities. In a similar way, the difficulties of describing the range and various states of plant communities that characterise the high country was made possible by developing a series of simple "pictures". And, in turn, with a common language to look at issues such as Hieracium, grazing and conservation, it became apparent that vegetation dynamic processes throughout the high country are very similar. This has important implications for participatory approaches as farmers and scientists from different areas can now, with a common language, more easily share and build on their collective experiences.

Although co-operative ventures such as those described here may not yet offer definitive solutions to such elusive issues as sustainability, they can begin to offer a variety of knowledge-based tools and possible courses of action to enable the community to make better informed decisions. In turn, as communication flows between different sectors of the community are expanded and improved, the level of needless conflict surrounding a number of land management issues should be minimised. Accordingly, this participatory approach represents a framework through which different segments of society can cooperate to develop and work towards a more coordinated set of environmental goals.

References

- Allen, W.J.; Bosch, O.J.H.; Gibson, R.G.; Jopp, A.J. 1995. Co-learning our way to sustainability: Integrating local and scientific knowledge through an evolutionary research approach to support land management decision-making. *Proceedings 1st International Conference of MODSS for Agriculture and Environment*, Honolulu, July 23-29
- Argyris, C.; Putnam, R.; Smith, D.M. 1985. *Action Science*. Jossey-Bass; San Francisco
- Bawden, R.J.; Ison, R.J.; Macadam, R.D.; Packham, R.J.; Valentine, I. 1985. A research paradigm for systems agriculture. *Agricultural Systems Research for Developing Countries, Proceedings of an International Workshop* (ed. J.V. Remenyi) ACIAR
- Bawden, R.J. 1987. Learning systems and technological change. *Proceedings of the Centenary International Conference on "Technology, Education and Society: Future Direction"* RMIT, Melbourne
- Bosch, O.J.H.; Williams, J.M.; Allen, W.J.; Ensor, A. 1995. Integrating community-based monitoring into the adaptive management process - the New Zealand experience. *Proceedings of the Fifth International Rangelands Congress*, Salt Lake City, July 23-28, 1995
- Bosch, O.J.H.; Allen, W.J.; Williams, J.M.; Ensor, A. 1996. An integrated system for maximising community knowledge: Integrating community-based monitoring into the adaptive management process in the New Zealand high country. (In press) *The Rangeland Journal*
- Checkland, P. 1981. *Systems thinking, Systems practice*. John Wiley & Sons; Chichester
- Gibson, R.S.; Allen, W.J.; Bosch, O.J.H. 1995. Condition assessment concepts and their role in facilitating range management. *Annals of Arid Zone* 34(3): 179-189
- Ison, R.L. 1993. Changing community attitudes. *The Rangeland Journal* 15(1): 154-166
- Ruckelshaus, W. D. 1989. Toward a sustainable world. *Scientific American* (Sep)