

Supporting Collective Action in Pest Management – Aims and Frameworks

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Summary

Project and Client

This paper introduces concepts that articulate and frame the social directions and processes required to support collective action in pest management. It has been produced by Landcare Research for MAF Biosecurity New Zealand, to support the Collective Action and Participation workstream within the Future of Pest Management Project.

Context for Collective Action

People are central to achieving the ideal pest management system. A well-working system relies on relationships, trust and communications, which in turn underlie the system's capacity to adapt and change as pest work shifts and changes. To change people's behaviour requires system changes that can be categorised as 'soft' and 'hard'. 'Hard' system components in this context include institutional arrangements, legislation, Crown obligations, physical control & monitoring tools, and defined roles throughout the sector. 'Soft' system changes refer to the social changes people make, such as forming new partnerships, doing things in different ways, or developing innovative and locally appropriate solutions.

We look first at the different contexts where collective action is required for a well-managed pest management system. Pest management relies on a range of activities that happen at a number of scales. Strategies and policies are the work of national and regional levels, and action is taken more at local level. In many cases, this action on the ground will be managed by sector or geographic partnerships. In some cases it will need the support of groups who are more peripheral to pest management, i.e. the general public. So it is useful to acknowledge three broad levels of interaction that require different types of collaboration and collective action. These are:

- Strategy and policy
- Regional or sector-based operations
- Wider publics

Second, we look at social theory and practice that help us develop collaborative approaches that achieve the most efficient and effective collective outcomes. These are set out here to help us understand how social systems evolve and operate, and how we can most effectively intervene in them to support constructive collective action. Finally Appendix 1 offers an indicative tool, or checklist, which could be further developed and used to support best collaborative practice at any of the three levels of collaboration set out here.

The pest management system is highly complex, having many interacting human (e.g. managers, communities, policymakers) and non-human (e.g. pests, ecosystems, poisons, strategies, x-ray machines) agents, each of which affects the evolution of the system through feedback mechanisms. Change in one part of the system will create or require change in other parts of the system. Moreover, the multiple feedback mechanisms in the system make it impossible to predict the outcomes of interventions accurately. Some interventions will surpass expectations, while others may have no effect at all – or even provide unexpected negative effects.

It is important to distinguish between ‘simple’, ‘complicated’, and ‘complex adaptive’ systems. Simple and complicated systems are predictable, while complex adaptive systems learn and evolve over time. Managing each type of system requires the use of different tools and approaches. Social systems are good examples of complex adaptive systems.

Gaining the active participation of the required stakeholders is an ongoing process that relies on a network of relationships built on trust. Building capacity for communities and agencies to work together creates the relationships that can ‘grease the wheels’ of future pest management initiatives. The theory of planned behaviour and other studies in social psychology suggest that getting communities on board with the reasons for pest management, and keeping people in touch with what others are doing in that line, provide individual community members with the motivation to maintain communally desired behaviours.

The complex, dynamic nature of the pest management environment and the range of communities involved in pest management indicate that the perfect pest management system will never exist as a final product. Instead the system should always be seen as one that can continually adapt, learn and change.

Conclusions and Recommendations

Government agencies at central and regional levels, land managers, landowners, iwi and other key stakeholders are best seen as ‘actors’ at the heart of the change process. Ideally, a partnership approach should be adopted in which change partners (including members of the different stakeholder groups involved) are involved from the start in defining and redefining the problem through a continuous cycle of action and reflection, from which learning and innovation will result.

A number of capacities and skills are crucial to this. It is important to have access to a pool of experts in social processes to help develop strong collaborative approaches and work constructively through any conflict. Stakeholders, including agency staff, should be helped to develop the skills to participate in collaborative processes. Efforts need to be made to ensure that institutional and organisational cultures support genuinely participatory processes.

Human behaviours are complex and non-linear and are determined by many interrelated factors that may need to be addressed simultaneously to facilitate change. Thus, interventions should combine multiple types of instrument in a ‘package’ of measures (e.g. infrastructure, fiscal measures, and incentives). All of these measures must be underpinned with information and learning-based approaches and be aimed at supporting the needs of people at various stages of change.

Different audiences require targeted and/or tailored interventions. To be effective, policy measures should be context specific. Care is required to ensure that the relevant skills and resources are available within the different organisations and agencies so they can get to know their different target audiences and develop appropriate programmes.

Government policy must convey a consistent message and visibly pull in one direction. Good internal and interagency collaboration is needed if Government policies are to align and convey clear messages to target audiences and the public in general.

Individuals have the potential to act as ‘change champions’. Such individuals are vital to delivering pest management messages and change. Locating, engaging and nurturing key

individuals may be an effective way to provide social proof and to use the principle of ‘authority’ to bring about system-wide change.

Feedback is vital to driving and sustaining change. Fostering change is not a single event. Rather it is an ongoing process that involves learning through feedback and reflection. This can apply as much to the success of a possum control operation as to a new Government policy. Interventions at all levels must incorporate ways of getting feedback so that progress towards desired goals can be measured. Involving stakeholders is essential if we are to manage in a constantly changing environment. Their experiences enable lessons to be learnt from a greater number of situations. Adaptive management approaches allow the use of local and cultural knowledge, and the adoption of a continuous enhancement process. At the same time, involvement in the participatory processes of monitoring and adaptive management allows individual stakeholder groups to acquire greater technical expertise, building on both collective local knowledge and an associated scientific awareness of their particular physical environment. By achieving specific objectives for the management of pests through a collective effort, stakeholders are likely to develop greater confidence, and that, in turn, ensures the successful continuation of the whole process.

1. Introduction

The LECG think piece on the future of pest management in New Zealand calls for people to work together in a more coordinated, collaborative way using partnership-based approaches rather than command-and-control approaches (Hellstrom et al. 2008). Successful pest management is inherently a collective endeavour. Policymakers and agencies cannot address New Zealand's pest management challenges without significant good will and collective action from land managers and a whole range of publics. However, collaborative programmes – especially those that require some degree of good will by the different partners – bring their own particular challenges. For one, each set of actors will have their own viewpoints on any particular pest issue, and their own reasons for getting, or not getting, involved in programmes of management. So 'the programme' is more accurately regarded as a number of separately run activities, each of which is 'steered' by a different group of participants according to their values and aspirations.

It is unlikely that groups with different interests, objectives and values will truly work as members of a larger societal team. But with the help of appropriate mixes of policies, and well-crafted participatory and system-based processes, it is likely that programmes can meet the needs and values of those involved, and develop constructive responses that help achieve stated management aims. In that context, this paper introduces concepts that articulate and frame the social directions and processes required for collective action in pest management. First we describe three broad levels that require different types of collaboration and collective action. These are the strategy and policy level, the regional or sector-based operational level, and the general public. Then we present a range of best and emerging social theory and practice perspectives that can be used to develop collective action and commitment. These highlight the importance of addressing relationships, people's drivers/motivators, trust, and communication in achieving an idealised pest management system.

This paper is *not* a replacement for an expert in social processes sitting within the working groups, nor is it, or could it be, a prescription of what to do to create the 'perfect' pest management system. Social science, like ecology, genetic engineering or toxicology, is just one aspect (albeit an important one) of pest management. Similarly, and again like those other disciplines, it possesses no magic bullets that will automatically and completely 'fix' the problems in the system. As such, this report is not a solve-all for creating failsafe collaborative processes. It does, however, offer some principles which, if put into practice in a thoughtful and careful way, will increase the likelihood of supporting collective action initiatives and helping them operate more efficiently over time. It also recognises contributions from social science that have been tried and tested in many different situations.

2. Objectives

To introduce concepts that articulate and frame the social directions and processes required to support collective action in pest management, by:

- describing three management levels that require different types of collaboration and collective action, and
- presenting best-practice and emerging social theory and practice perspectives that can be used to develop collective action and commitment.

3. Levels of Decision Making and Collaboration

Pest management relies on a range of activities that happen at a number of scales. Strategies and policies are the work of national and regional levels, and action is taken more at local level. In many cases, this action on the ground will be managed by sector or geographic partnerships. In some cases this action will need the support of groups who are more peripheral to pest management, such as members of the public. So it is useful to acknowledge three broad levels that require different types of collaboration and collective action. These are the strategy and policy level, the regional or sectoral operational level, and the general public.

3.1 Strategy/policy-level development

This level of activity is exemplified by the work currently going on in pest management. At this level, the work is about creating an environment that enables the desired changes in practice to be supported, adopted and enacted by the different stakeholder groups involved. Hence policy and strategy must be grounded in the realities of the stakeholder groups that will be affected, but which need to change. Clearly, participating at this level will only involve a select number of people, but a well-run process will gain relevance from involving different representatives, and gain legitimacy by being obviously transparent.

In recent years, there has been a rethink about the role of regulation in environmental policy (Allen et al. 2002). Regulation is no longer seen simply as a tool for enforcing a policy that has a certain and well-defined effect. Instead, the complexity of managing across multiple social perspectives is acknowledged, and policy success is seen to depend on the cooperation of different groups within society. This acknowledges the role of governance as the ‘art of steering societies and organizations’ (Plumptre & Graham 2000).

To manage this steering process, environmental policymakers around the world are increasingly using a range of different policy approaches (e.g. regulatory, economic, or voluntary) to promote action on environmental issues. Each mechanism has specific strengths and weaknesses, and successful approaches will tailor a mix of mechanisms to individual situations. However, as Young et al. (1996) observe, all of these mechanisms work best when used in combined with supporting collaborative activities such as sharing information, social learning and motivational approaches. Thus, collaborative activities underpin all pest management policy approaches, not just voluntary ones (see Fig. 1).

A collaborative and participatory approach to setting up enabling policy, guidance and funding that will drive the shape of wider pest management practice is also borne out by other contemporary governance literature (e.g. ESRC 2000; de Loë 2009). Furlong and Bakker (2008) suggest that this includes setting a vision that is long term and developed cooperatively among stakeholders. This vision should embed the longer term aim of sustained change in pest management and align it with related desired environmental, agricultural, and conservation outcomes. These authors also point to the importance of involving a range of actors in decision making and governance. This requires action from all levels of government, and delegates powers to lower levels to facilitate broader programmes and minimise conflicts (Furlong & Bakker 2008).

Transparency is vital in the development of policy and strategy at national level, and can be provided by processes that encourage different stakeholders to work together to create solutions (e.g. learning groups). Social-process experts can assist in the design and implementation of forums and approaches that help people talk across their different disciplinary and experiential silos (Allen & Kilvington 2005; Reed 2008), and work with iwi (Harmsworth 2001). Working across boundaries (which can be organizational, cultural and/or sectoral) is a critical process that is often taken for granted, but which is often difficult – and would benefit from facilitation.

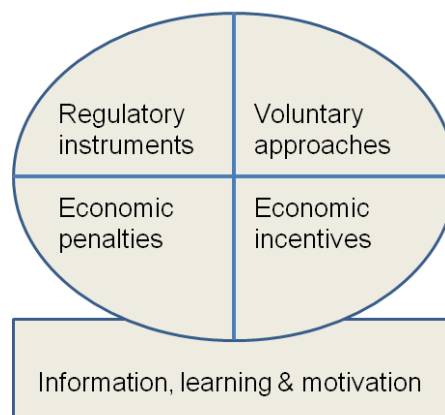


Fig. 1 Major types of policy instruments and their relationship to information, learning and motivation (adapted from Young et al. 1996).

3.2 Regional/sectoral (operational) partnerships

At this level, processes need to be even more inclusive and involve end-users in groups. Inclusivity assists with the development of operations that work because they have the buy-in of those who do the actual pest work. One example (Box 1 provides another) is the successful LIP (Locally Initiated Programme) scheme in which groups were set up by the Animal Health Board to encourage farmers in bovine Tb areas to undertake possum and ferret control (Oliver et al. 2000). Facilitators were employed to motivate and organise farmers. The LIP groups allowed farmers to learn from others about pest control and to encourage everyone to keep doing the work.

Box 1 Māori and 1080

Horn and Kilvington (2002) talked with a number of players working to control possums on Māori land and adjoining DOC land. They were particularly interested in what had transpired in places where all players spoke positively about an operation that had been successfully carried out.

Factors that contributed to success were the use of a communications specialist whom other staff trusted and who was able to lead staff through meetings with Māori and help them through any difficult aspects of the communication. Plenty of time was allowed for the process to occur – so contact was initiated a year before any operation was planned. Māori groups were given a genuine say in how pest control was carried out in their areas without compromising budgetary considerations. Furthermore the Māori groups were given a range of options and costs for different techniques, and were asked to consider them all.

In many cases this led to the development of a partnership approach in which DOC carried out aerial parts of the operation and local Māori provided labour for those parts of the operation they did not want done aurally (e.g. close to watercourses). This approach took considerable investment of consultation time, but DOC staff noted that in later operations, all that was required was a phone call, some negotiation around timing, and confirmation of the methods to be used. Hence the process continued to reap benefits many years after it was completed.

At this level, developing networks is an important element of the work and one that is often forgotten in the focus on generating behaviour change. As with work at the national level, pest managers working at regional level need approaches that help them to work across silos, agencies and organisations. Although we talk about networks, we need to remember the importance of key individuals within networks. Individuals are vital to delivering pro-environmental change, not just for themselves (as individuals) but also within organisations and networks as ‘agents for change’ (both as managers and ‘change champions’). Engaging and nurturing key individuals may be more effective in bringing about system-wide change than targeting the behaviour of all individuals.

Where collaborative partnerships are set up, it is vital that partner groups, who often work voluntarily, have access to funding for the issue at hand and that helps them to continue operating. While people may be prepared to give of their time to work on the immediate issue, it is often difficult to find someone who can give up the amount of time and provide the energy required for coordinating group activities, and undertaking tasks such as preparing funding applications for operational activities. The importance of this role for pest management is highlighted by Oliver and colleagues (2000). Observations across groups such as the Banks Peninsula Conservation Trust and Kaupapa Kereru, who have organised and assisted pest management programmes in their area, indicate that these groups need access to a paid coordination role. At present this can be problematic because many funds only offer seed funding, which tends to result in groups that exist only for a short time because they are unable to find funding for ongoing activities.

3.3 Reaching out to wider publics

A third level of partnership activity is reaching the wider public. This clearly includes target groups such as tourists and travellers, who may unwittingly be carrying flora or fauna that are, or have the potential to become, pests when moved from their natural settings. However, in a wider sense the general public need to be aware of pest management issues, policies and management activities.

When working with these larger groups, it is important to be able to tailor campaigns and supporting activities to maximise the desired outcomes. The ability to provide messages that

help capture attention are of particular importance in situations of low personal pest management involvement, such as tourists may have, where the individual has no special interest to engage in effortful thinking about potential pest spread.

Hence successful programmes include time spent learning about the perspectives of target groups. This process is illustrated by work completed some years ago by MAF communicators who researched how Chinese travellers and residents understand what is required of them at the New Zealand border. This led to the development of a successful programme aimed specifically at these groups. Another effective campaign has been the Check,Clean,Dry campaign aimed at recreationists who use waterways, to limit the spread of the pest alga *Didymosphenia* in New Zealand (MAFBNZ 2008). These programmes also benefit from good evaluation processes and a good understanding of the social psychology of persuasion and change practice.

4. Understanding Collective Action

In this section we set out a range of best and emerging social theory and practice perspectives that can be used to develop collaborative initiatives. We begin by describing how different perspectives on pests and pest management reflect different social and sectoral values. We then introduce systems thinking, and the differences between ‘simple’, ‘complicated’ and ‘complex’ systems. The challenges of working with complex social systems are discussed, and illustrate the need for guidance rather than control. The key skill and organisational areas needed for successful collaboration are outlined. We provide examples of how social research models can contribute to understanding the different ways people conceive of their involvement. More examples from social psychology are provided to illustrate how campaigns can be improved to reach out more effectively to pest management partnerships and wider publics. Finally we look at the importance of feedback and adaptation in a system that will achieve sustained pest management.

4.1 Pests reflect different social values

The pest concept is socially constructed and very much depends on the perspective of the observer. For example, beekeepers see broom and gorse as useful plants, while farmers see them as pests. Other groups, such as those involved in native bush restoration, birdwatchers and urban dwellers, may each have different perspectives again. For example, many tourists and city people liked the colour that Russell lupins provided in the spring around Mt Cook, whereas ecologists see them as a major threat to braided river habitat; some people don’t like killing possums because they are nice furry creatures; and deer are a good source of food and game animals for some, while they are classed as pests by others.

The location of a plant or animal also makes a difference. Russell lupins in a private garden are not a pest, whereas they are in braided rivers. Deer are not pests on farms, but they might well be seen by many as such when on public conservation lands.

Furthermore, perceptions and understandings of what constitutes a pest problem, and pest solution, evolve over time. For example, wilding pines are now considered a major problem in much of the South Island high country, where once they were thought of only as a useful

commercial crop and as positive landscape features. The classic example of ferrets and stoats, introduced as biocontrol agents and now regarded as highly problematic pests in their own right, illustrates this change graphically. Each of these changes results from complex interactions between organism and place, *and* the ways in which people value different aspects of their places. Thus New Zealand indigenous biodiversity is arguably of higher value to New Zealanders now that we are more aware of its uniqueness, than it was in times past.

Our understanding of how to manage weeds and animal pests has changed so that now people consider it important to also look at the *effect* of pest management work rather than just at pest management itself. But possum management for biodiversity purposes may be different to possum management for eradicating Tb. Likewise, in a recent change in thinking about where to put resources for weed management we acknowledge that the biggest weed problems may not always be situated where we would get the greatest return on investment. Although new incursions are less visible, it may be better to put resources into eradicating these *before* they become a problem. At the same time, our social experiences indicate that changing pest management in these ways requires building different kinds of relationships and public understanding to the ones we currently enjoy when working on the more obvious problems.

These differences in social values mean that pest management is essentially a political exercise, particularly given the fact that the Biosecurity Act 1993 defines a pest as ‘any organism that is part of a national or regional pest management strategy’. Arguably what organisms get classified as pests through the strategy development process may be the result of which voices were heard most loudly during consultation processes, rather than which pest issues warrant most attention. Further, to have collective action, there has to be some agreement about what constitutes a pest problem in the first place. Given the varying perspectives above, even this is unlikely to be always straightforward and it may vary considerably both within and across communities. These differences also highlight the need for pest managers to reflect on their own and others’ perspectives, and how these interact to affect pest work in New Zealand.

4.2 Managing complex adaptive systems

Pest management takes place within a complex social, technical and ecological system. The myriad interrelations between multiple human and pest actors, and ecological, economic, political and technical influences, support the argument for using a systems approach to improve pest management in New Zealand. Many of us have an intuitive understanding of the term. However, we need to make the understanding explicit in order to use systems thinking and systems tools in organisational change.

A major breakthrough in understanding the complex world of organisations and socio-ecological environments is the field of systems theory. People working in this field see systems as whole systems composed of various subsystems and a set of patterned relationships. Systems thinking is a way of helping people to see the overall structures, patterns and cycles in systems, rather than seeing only specific events or elements. It allows the identification of solutions that simultaneously address different problem areas and leverage improvement throughout the system. This priority on the wider system and its leverage points is called ‘whole systems thinking’. Practice developed from this approach provides tools for managing challenging, interlinked situations.

It is important to distinguish between ‘simple’, ‘complicated’, and ‘complex adaptive’ systems. Simple and complicated systems are all fully predictable. We can understand these systems by taking them apart and analysing the details. From a management point of view we can create these systems by first designing the parts, and then putting them together. However, we cannot build a complex adaptive system (CAS) from scratch and expect it to turn out exactly in the way that we intended. Complex adaptive systems are made up of multiple interconnected elements, and adaptive in that they have the capacity to change and learn from experience. Examples of complex adaptive systems include human beings, the stock market, ecosystems, immune systems, manufacturing businesses and any human social-group-based endeavour – including pest management – in a cultural and social system. Complex adaptive systems defy attempts to be created in an engineering effort. But we can achieve some understanding by watching and studying how the whole system operates, and we can influence the system by implementing a range of well-thought-out and constructive interventions. Glouberman and Zimmerman (2002) provide a useful outline of the management differences between simple, complicated and complex systems (see Table 1).

Table 1 Managing simple, complicated and complex systems (Glouberman & Zimmerman (2002))

Simple systems (like following a recipe)	Complicated systems (like sending a rocket to the moon)	Complex adaptive systems (like raising a child)
The recipe is essential	Formulae are critical and necessary	Formulae have a limited application
Recipes are tested to assure easy replication	Sending one rocket increases assurance that the next will be OK	Raising one child provides experience but no assurance of success with the next
No particular expertise is required. But cooking expertise increases success rate	High levels of expertise in a variety of fields are necessary for success	Expertise can contribute but is neither necessary nor sufficient to assure success
Recipes produce standardized products	Rockets are similar in critical ways	Every child is unique and must be understood as an individual – relationships are important
The best recipes give good results every time	There is a high degree of certainty of outcome	Uncertainty of outcome remains
Optimistic approach to problem possible	Optimistic approach to problem possible	Optimistic approach to problem possible

As Table 1 shows, developing a *simple* system is like cooking a meal from a tried and trusted recipe. A reliable solution delivers almost identical results every time with no particular expertise required. Thus, in pest management terms, this is most like a householder trapping mice around home. If there are mice present, it is a straightforward task to bait and set a trap or place poison around where the mice are.

Developing a *complicated* system is like building a moon rocket. It requires high levels of coordinated knowledge, expertise and experience to achieve the required result. A clear plan is critical and the process requires the rigorous coordination of a range of experts. In pest management terms, this is like managing a large field control exercise that involves the aerial placement of 1080. It uses the input of helicopter pilots, GPS equipment and those who

handle the poison and oversee the operation, and uses the knowledge derived from studies in toxicology and animal ecology.

In contrast, managing a *complex adaptive system* is more akin to raising a child. There is no blueprint, recipe or hard-and-fast rules. Expertise can help, but is not sufficient. Every child is unique and the outcome remains uncertain, despite a parent's or caregiver's best efforts. Children must be allowed to take risks so they can learn. Too much or too little parental control throughout their development tends to lead to less positive outcomes, making it necessary to strike a balance and to effectively negotiate the path of the child's upbringing with that child. Principles can be used to guide parenting, but not to prescribe it. It is impossible to know what the right way to do this is. Judgment may be a matter of perspective. Getting people to work collectively in a coordinated fashion is more akin to raising children than building rockets to go to the moon and back, a fact many people recognise.

However, recognising the system as complex does not necessarily mean that there is a good understanding of what this means for management action. In many cases people continue to refer to the system as if it were complicated rather than complex, perhaps because this is a familiar approach, and there is a sense of security in a blueprint. Furthermore, it is easier to spend time refining a blueprint than it is to accept that there is much uncertainty about what action is required and what outcomes will be achieved. When dealing with a complex system, it is better to conduct a range of smaller innovations and find ways to constantly evaluate and learn from the results and adjust the next steps rather than to work to a set plan.

The art of management and leadership is having an array of approaches and being aware of when to use which approach. Ralph Stacey (2002) proposed a matrix to help with understanding which category – simple, complicated or complex – systems fall into. He develops this by identifying management decisions on two dimensions: the degree of certainty and the level of agreement (Fig. 2).

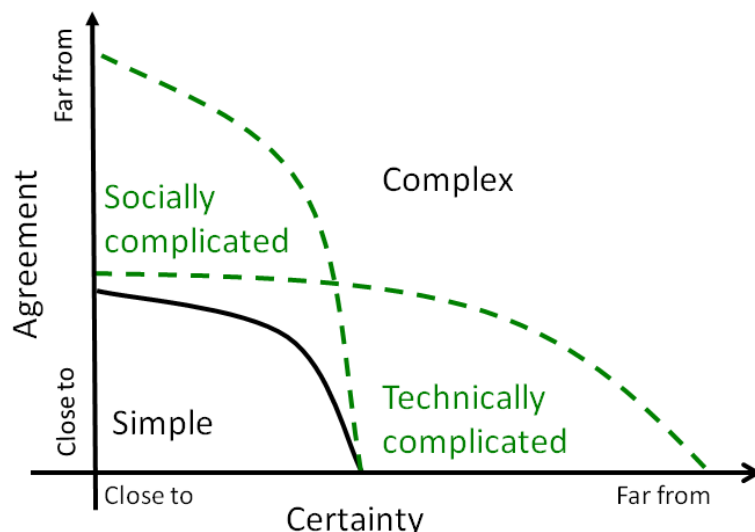


Fig. 2 Ralph Stacey's agreement and uncertainty matrix (Adapted from Stacey 2002)

With simple and complicated problems or issues, one can define the problem and strategically develop actions, time frames and milestones along a path to success. In complex situations, action planning and problem solving are generally non-linear and outcomes are far from certain. Strategic plans, while useful in these situations, cannot provide a clear recipe for success and are best viewed as guides rather than rule books.

Cause and effect are difficult to predict in complex situations, so that it is common to find unintended effects from new policies and programmes. Protests associated with the use of 1080 in possum control operations are often an unintended effect of pest management work that was focused on finding cost-effective ways to kill possums without getting local buy-in. In an ideal pest management system, people need to be able to work together to respond thoughtfully to what they see changing and/or working or not working.

Box 2 A thought experiment – identifying different system types

A useful exercise to do by yourself, or in a group, is to think through a number of recent pest management issues and decisions that you have been involved in over the past couple of months and sort them into three categories - simple, complicated or complex. Then think about the management techniques or approaches that have been used for each issue, and assess how well the management response has fitted the issue.

Most issues will have all system types present, and there may well be multiple systems involved. For example, in North Canterbury the issues that surround bovine Tb vector control are typical of the multi-faceted challenges which face many pest management initiatives. This example highlights that pest management is usually done as a way of achieving a wider outcome – in this case animal productivity and Tb control. In other cases conservation issues may provide the primary motivation.

An example of a simple system in this case could be designing programmes to control ferrets, such as those set out on the Landcare Research website <http://www.landcareresearch.co.nz/research/wildlifeecol/ferrets/>. These protocols are known to be robust, and if followed carefully will serve to control ferrets in the immediate area. The Tb management system, on the other hand, can be usefully seen as complicated. It involves expert development of regimes of stock testing, stock movement control and the control of infected wildlife (vectors). The placement of movement control boundaries is another critical design issue. Certainly the social part of this system is complex – looking to change stakeholder behaviour among other drivers – but we are fairly confident that we can design a system that if carried out according to specification will help us on our way to developing Tb-clear status. Moreover, the cost of infection is direct for those landowners with cattle or deer that are involved in movement control.

Developing a system to encourage farmers to complement the AHB's official control efforts is more easily regarded as complex and needing to be developed incrementally. We can't predict how many farmers, with the right attitude and skills, will take up the challenge to successfully lower vector numbers. Moreover, the cost of infection varies between farm types and is only a problem for farmers with cattle and deer. Other farm enterprises, such as sheep or horticulture, are not directly affected by bovine Tb and so are less motivated to cooperate with their neighbours in undertaking vector control. A good partnership initiative is dependent on the building of good relationships, and working in different ways with individual farmers to support their specific need.

In complex situations it is useful to move beyond thinking of 'a change' that will fix the system, and instead look for a number of leverage points that may be changed to improve the system. Changing what people do, for example, may require changes in rules (e.g. laws, protocols, and tacit norms), changes in relationships, networks, and patterns of behaviour (e.g. how conflict is handled, how mistakes are managed, how power is used) and tools (e.g. databases, checklists, guidelines) for this change to 'stick.' Thus, making it illegal to bring unwanted goods through the border will not necessarily change behaviour. Public education processes that help people understand why they cannot bring in some items, finding champions, providing information, providing bins where people can offload offending goods, and the development of tools such as instant fines and surveillance methods are all aspects of making this rule work as intended.

A one-size-fits-all approach will not work. The way pest management is visioned and delivered locally must reflect the values, contexts and cultures of each different community. This is why initiatives in the Far North are different to those in the Hutt Valley and Christchurch. A successful pest management programme used in one community will require adaptation to local conditions when it is used in a new community.

Finally, as with parents raising a child, people working in complex situations need to keep learning about that situation, and to keep talking and working together in an ongoing way. Future visions and common goals need to be openly discussed and agreed, and tentative pathways charted. While some actions will be taken by individual agencies working alone, new layers of creative partnering arrangements will need to emerge – increasingly at the collaboration and partnership end of the partnering continuum. In turn, this will require government and non-governmental agencies to continually re-evaluate the way they operate and interrelate if power, resources, risks, rewards and accountabilities for positive change are to be meaningfully shared and outcomes achieved.

4.3 Skills and capacities that support collaboration

There are three broad areas in which it is important to support capacity building to enhance collaboration in pest management. First, people with expertise in social processes are needed in the pest management system at all levels (just as are technical experts). Second, different stakeholders need the capacity to engage constructively with others, and remain as part of a wider team. This capacity is important in the development and operation of clubs and interest groups. Finally, we need institutional and organisational cultures that support and encourage genuinely participatory processes.

Experts in social processes

Cooperative programmes need people who understand the social processes that surround collaboration and engagement. This is more than just having great communication skills – it is also about being able to assist others with their communication and to work through conflict and road blocks that emerge when different stakeholders come together. Experts in social processes can work with technical experts to help plan and adapt engagement processes and to design programmes that meet the needs of the setting and the stakeholders. This holds true for horizontal engagement (agencies to agencies) as well as vertical engagement (agencies to publics).

Having access to a pool of experts in social processes is important to help groups develop strong collaborative processes (particularly in the early stages of group formation) and to work through any conflict. Just as with technical people, these people do not need to be present all the time, but they should be able to help with the design of processes, and to ensure that people running programmes have adequate social process skills. If these people are left out, projects tend to get involved with just ‘the usual group’ of people, and changes are not as effective as they could be.

This means that pest management teams need access not only to personnel with technical skills, but also to experts with complementary skills in the management of participation and conflict, and the integration of biophysical and social aspects of collaborative learning. As much attention will need to be paid to review and evaluate the social processes by which such endeavours encourage learning and collaboration as is currently given to assuring that good

technical practice is being followed.

Teamwork and collaboration

Participatory processes require a number of capacities that do not always exist either in the community or sector involved, or in the organisations running the processes. Some people have not worked in participatory processes before so it takes time to learn; however, the outcomes of participatory processes that are done well *do* justify the learning required.

One example of the different process steps that can be involved in more collaborative initiatives is provided by looking at the way in which 1080 consultation is often done. A critical element in the case provided in Box 1 was that rather than turning up to consult (or persuade) these Maori communities about a *solution* (i.e. the aerial use of 1080), DOC staff began by working with the communities to agree on there being a possum problem that needed a solution. From there they provided a range of options within a stated budget and allowed the possibility that the communities might also come up with some viable ideas of their own. Interestingly they did come up with their own solutions that were viable and within budget and which were used in the final operation. Here then, the agency staff had to work on their own capacity to start a process in the right place, while the Maori communities also had to develop their capacity to understand the implications of the different options. They spent considerable time grappling with the different options and their implications so that they could come to a solution.

Initiatives throughout the pest management system will often involve people working in groups and mixed community and organisational teams. Teamwork is important because innovation is more likely to emerge from mixed teams, where they can share different ideas and perspectives on the problem. However, for a team to work well together and develop innovative solutions, they need time to work together and get to know each other and their respective knowledge bases.

Accordingly, an understanding of how to initiate and foster these social units is essential for delivering participation in any particular project that requires action on the ground. Experts in social processes can assist here also by helping people learn how to work effectively as part of a team. While this kind of work comes naturally to some, others may need to learn how to do it. In our experience, even those who are naturally good at it can enhance their team's performance by reflecting on the processes involved in teamwork and thinking about the approaches that work best in their particular team.

Overcoming institutional barriers

In environmental management generally, there is a growing appreciation that the more immediate barriers are organisational and social rather than technical (McLain & Lee 1996; Gregory et al. 2006). These barriers include a tendency to discount non-scientific forms of knowledge, institutional cultures within research and policymaking that work against genuinely participatory approaches, and a failure to provide social processes that build shared understandings among diverse stakeholders (Allen & Jacobson 2009).

There are a number of reasons why this is so. First, institutions, particularly government institutions, seldom operate as learning organisations. Most are risk averse and, like those studied by Carl Walters (1997), prefer to maintain a veneer of certainty, so they look credible and so that the government looks good to the electorate. Performance management structures and funding structures also favour those who appear certain, with funders preferring to back

projects that claim to have certain outcomes, rather than those that admit they are trying to learn their way through a complex problem. Sadly, if an organisation is prepared to admit they are dealing with uncertainty, then they run the risk of looking bad alongside their more ‘certain’ counterparts. Individuals who want funding need to avoid stepping into an area that requires risk taking or experimentation, and managers hoping for a good bonus will avoid risk. In New Zealand, the relatively short, 3-year electoral cycle also impacts significantly on all government activities including pest management, since elected representatives are required to demonstrate to the wider electorate short-term (2–3 year) improvements.

High staff turnover often works against continuity in relationships with other organisations and community groups, and it may negatively affect institutional memory. This diminishes the organisation’s capacity to learn over time and makes it difficult for partner organisations and community groups to operate well in the system.

In our work with agencies and community groups, we have found that there are often considerable institutional barriers to working effectively across ‘silos’ or with community groups. For example, when one part of a organisation (not identified here for confidentiality reasons) began working with community groups, they found themselves sitting across the table and challenging people from other parts of their own organisation. This meant that the organisation had to change the way it worked both internally (more communication was needed between groups who had not previously worked together) and with external parties. Similarly, barriers arise when it comes to data sharing or even agreeing on what information should be put into an information system that is hosted by a stakeholder organisation.

In some organisations, internal processes may prevent the input of new information from ‘new’ stakeholder groups, so that although staff in one part of the organisation are endeavouring to run a meaningful participatory process, internal processes can turn it into something tokenistic in nature when others in the organisation are unable or unwilling to incorporate the new information into their work practices. So, for example, institutions can find it difficult to work with Māori because indigenous knowledge and practices may not sit easily alongside institutional systems and processes. Often something as simple as finding the time and resources required to meet with stakeholders may provide the impetus required to begin developing more constructive relationships.

4.4 Linking policies and partnerships

Setting up policy and strategy frameworks is a key aspect of developing a collective system. These are long-term frameworks that will underpin the success of the way people are brought into the system, and that will eventually link ‘hard’ and ‘soft’ parts of the system. This subsection presents the ‘Orders of Outcomes’ framework, which offers a perspective on how ‘hard’ and ‘soft’ link, and looks at how these elements are linked together in developing integrated policy approaches.

Achieving sequential outcomes

To deal with pests and their impacts, management systems must be designed to:

- Last over long periods of time, often several decades
- Be adaptable to rapidly changing conditions
- Encourage or require particular forms of best practice
- Foster collaborative behaviours between institutions and user groups.

Furthermore, management systems need to take a long-term view of change. This can be challenging because many initiatives are only funded for a short (1–3 years) period so managers need a way to think about how short-term investments fit together in the longer term trajectory of social and environmental change in a given place (Olsen 2003; UNEP/GPA 2006). The Orders of Outcomes framework in Fig. 3 offers a way of doing this. In this framework pest management goals are achieved by negotiating and implementing a range of actions. The framework suggests that changes in pest management outcomes occur only after initial changes in the ‘harder’, institutional parts of the system, and then subsequent ‘softer’ people-management parts of the system – new relationships and changed practices on the part of stakeholders.

First-order ‘enabling’ changes include changes to legislation, policy frameworks, strategies, plans, infrastructure and funding programmes. These can be thought of as the ‘hard’ parts of the system. At this order of change, indicators of effectiveness will measure how well these institutional changes are developed and administered.

Well-constructed first-order or enabling changes to the pest management system will encourage people in the system to work together more effectively (second-order or ‘behavioural’ changes) to do pest management work. This can be thought of as the ‘soft’ or people management part of the system. At this stage programme effectiveness can be measured by looking at how well this behaviour is taken up. As the first- and second-order changes occur they will then result in environmental ‘end state’ changes such as fewer pests and more biodiversity or less Tb, followed by socio-economic end states such as more profitable agriculture and tourism sectors, for example, and better quality of life.

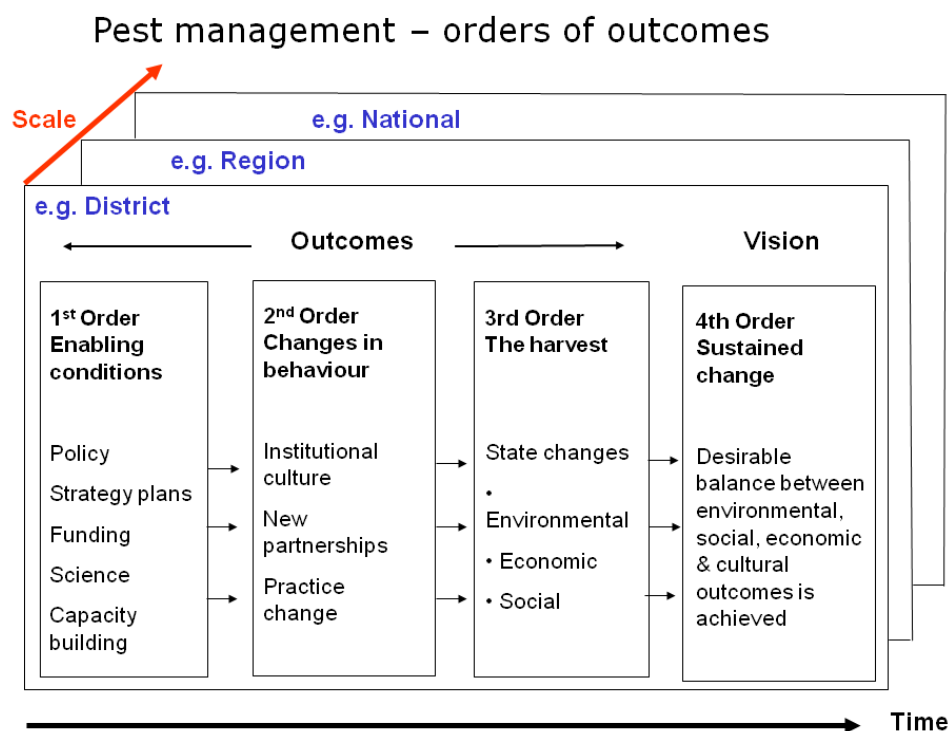


Fig. 3 Orders of Outcome framework approach to planning, monitoring and evaluation (adapted from Olsen 2003; UNEP/GPA 2006).

This type of framework can be incorporated into a ‘logic’ model to show how the technical and social aspects of the programme will be linked to deliver the programme goals. This same model can also provide a basis for developing a monitoring programme that accounts for both the ‘hard’ and ‘soft’ elements (Hellberg et al. 2009). Furthermore, the model can offer a holistic overview of policy and management development and design. It can also assist with identifying indicators to help assess and improve ongoing initiatives.

4.5 Motivating people for constructive change

To involve people in collaborative approaches, it is important to understand what support and encouragement people need to change. This subsection provides two social research frameworks that are useful for understanding how and why individuals behave as they do, and what it takes for them to change their practices. These frameworks provide understanding about how programmes aimed at changing people’s behaviour might be structured, both in terms of what might gain people’s attention and how subsequent change could be supported.

Factors motivating change

Understanding what motivates people to change is important. By highlighting the individual and social factors that must be considered when developing collaborative programmes (Fig. 4) this theory indicates the intervention points that can be used to develop communication and engagement programmes to assist people with changing their practices.

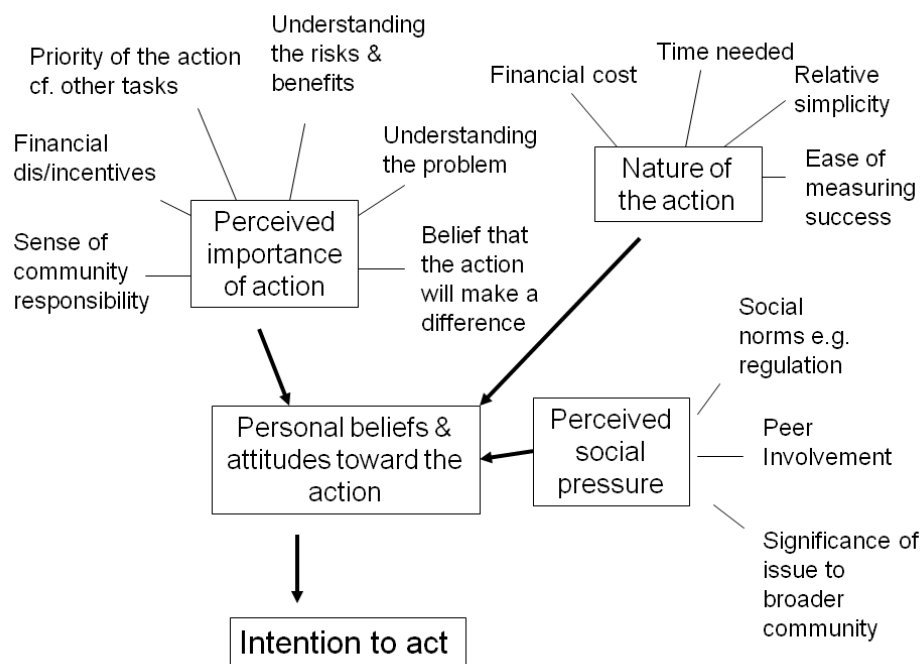


Fig. 4 A behaviour change model showing the importance of individual and social influences (source: Kilvington et al. 1999 – after Azjen 1991).

This model indicates that an individual’s intention to act is influenced by the social pressure on them to do it, how easy or difficult the action is, and how important they think it is. Thus getting farmers to do pest control will to some extent depend on how important the issue is to their wider community. For example, agencies responsible for the control and eradication of bovine Tb, such as the Animal Health Board and regional councils, first had to get agreement

from farmers in an area that Tb was an issue worth working on, and then develop a collaborative approach to moving forward.

It is also important to show farmers that their actions will make a significant difference to the issue (something that becomes easier as the outcomes from the work begin to become clear). The residual trap-catch (RTC) method of monitoring pest numbers provided good feedback in this regard, as did monitoring the health of local ecosystems for those farmers who have bushed areas on their land. Eventually a decrease in the incidence of Tb or successfully keeping it out of an area will provide longer term feedback.

Agencies can encourage collective pest control, and make it easier for farmers to do what is required, by providing feedback and training and facilitating local discussions so that farmers can learn from each other, be reminded of the importance and the effectiveness of their work, and stay motivated to continue with it. Some or all of these factors are present in successful programmes such as the Animal Health Board's local initiated programme (LIP) scheme, and the self-help possum control schemes that have developed in places like the Waikato, Hawke's Bay and Taranaki.

Stages of change

The second framework we present focuses on the stages people go through as they attempt to change what they do. This framework has been used extensively in the health sector to develop programmes to assist people to exercise more, stop smoking, lose weight etc. and with developing programmes to prevent the spread of Aids (Parnell & Benton 1999).

The *Stages of change* framework in Fig. 5 (Prochaska & DiClemente 1992) suggests that people can be usefully seen to move through five different stages of change. These follow a sequence from *precontemplation* (where an individual may be unaware of a problem) through *contemplation* (thinking about whether or not change is necessary), *preparation* (thinking about how to change), *action* (experiencing a new way of doing things), and then finally into a *maintenance* stage where the new practice becomes the norm. Each stage requires different forms of communication that provide support for the stage of change that the person is experiencing.

This framework suggests that individual change is linear and uniformly progressive. However this is seldom the case. Instead the individual may become stuck at one stage, or they may make changes (say as part of a New Year's resolution or as the result of a motivating workshop) but find that they cannot maintain that change when some element of stress comes into play. So, for example, a policymaker who starts to work collaboratively with a wider range of players may find that she can't do this because she does not have the time. In general, she will revert to working with a smaller range of people. However, if she is able to think about how she might manage this stress and change the way her time is structured, and if her manager and her organisation is able to help her to accommodate this change, then she will be better equipped to succeed when she next attempts to put this change into practice. Managing change at an individual level, then, is actually a series of learning experiences where the individual reverts, thinks about the barriers she encounters and finds her way through them (perhaps by talking with others who are making similar changes and who may be grappling with similar barriers).

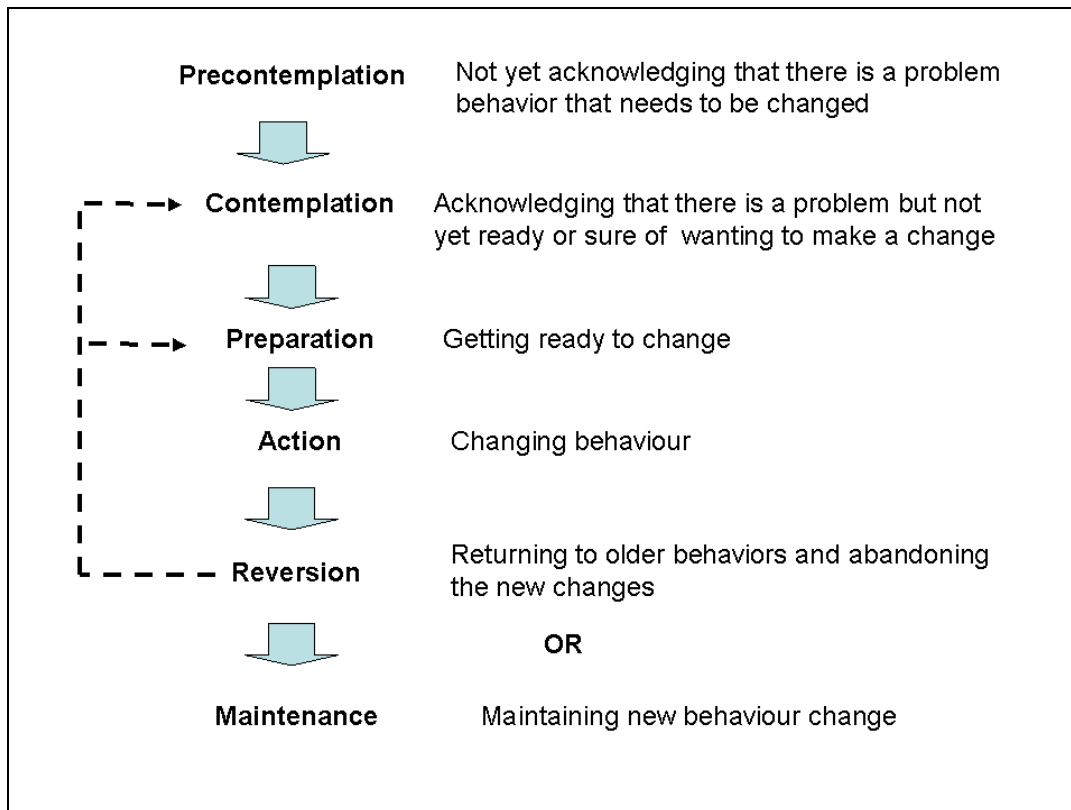


Fig. 5 Stages of change that people go through (adapted from Prochaska & DiClemente 1992).

This means that policies and programmes aimed at behaviour change need to include:

- Awareness raising
- Information that helps people understand what to change
- Processes that help people stay motivated
- Processes to help them learn how to work through the barriers that present themselves

Furthermore, these processes all need to be ongoing and tailored for both the target audience and the tasks involved.

4.6 Effective communication for partnerships and publics

Of course, many people are busy, and so have little time to engage with pest management information. In these situations, social psychology offers a set of principles that can help communicators to construct more engaging messages. These principles can be applied equally to engage communication within clubs and partnerships, as well as to ways in which we provide information to wider publics.

Much human behaviour is habitual. However, when external conditions change – for example when a new pest such as didymo emerges – old habits may no longer be appropriate. In situations like this, it is traditional to develop campaigns based on providing information about the effects of the choices we make, and what we could, or should, do differently.

However, current research in the domain of public health, energy consumption, waste management, etc. has shown that information-based campaigns, including the use of incentives, are, by and large, insufficient for stimulating behavioural change of lasting effect (Seethaler & Rose 2005). Using a travel example, Tertoolen et al. (1998) observed that the provision of environmental and economic information had a *negative* impact on pro-environmental behaviour amongst their sample.

Social psychology offers techniques that can help pest managers develop more effective public campaigns. One selection of these breaks them down into six principles (Cialdini 2001): reciprocity, scarcity, authority, commitment, social proof and liking. The following sections illustrate the possible application of these principles in pest management settings.

Principle of reciprocity

People like to reciprocate. Helping someone means an individual is more likely to receive help in return, because there is a tacit obligation to repay the favour. The models outlined earlier can assist with understanding the needs of different stakeholders and the ways in which they might be helped. Providing assistance in this way will increase the likelihood of people helping out in return. Helping in this way also provides a good basis for ongoing, trust-based relationships.

A nice example of reciprocity is provided by DOC's *Swap a Weed* event where, on a particular day and time, people can bring in their worst garden weed and swap it for a native plant. This event also raises awareness of weeds, and publicity at the event extends that awareness. At the same time the event helps gardeners improve their gardens.

Reciprocity also affects negotiation processes. Thus it is possible to increase the chance another party will be collaborative by being collaborative first. Being competitive and uncooperative during negotiations will most likely result in reciprocal behaviour by the other party. Giving concessions and sharing information first will encourage the other party to do the same.

Principle of scarcity

People assign more value to opportunities when they are seen as scarce. The use of this principle can be seen in sales techniques that suggest an offer is limited either in number or in time. The scarcity principle works for two reasons: First, things difficult to attain are typically more valuable and then when something becomes less accessible, the freedom to have it may be lost.

In a pest management context, this principle means that saying what benefits stand to be lost might be more important than saying what stands to be gained. So, for example, in negotiation around the need for pest management it is important to point out the advantages that will be lost (say in terms of biodiversity options for their children or Tb-free status) if the proposal is not accepted. This holds as true for face-to-face negotiations with industry sectors, as it does for developing a television-based awareness campaign.

Principle of authority

People like to follow legitimate experts. This means that it can be good to highlight a high level of expertise. However, it is equally important for a person to show that they are a trusted source of information, which can be difficult, particularly in situations where they are advocating for an unpopular decision already made. This has happened regularly in managing

resistance to the use of 1080 in pest management. Where consultation is tokenistic (i.e. a decision has been made and the consultation process is really aimed at persuading people how good 1080 is) it is possible that an individual will have lots of expertise on 1080, but they will be seen as biased, or part of an untrustworthy institution. No amount of expertise and authority is going to persuade people that an unpopular decision that has been forced on them is a good idea. In public campaigns, however, it may be useful to point to experts that people have reason to trust.

In the end, this principle is less about authority than it is about building and maintaining trust. In fact, it is clear that if authority is used as a tool to coerce rather than inform or encourage, it can create resistance rather than cooperation. A classic example of this was the Labour Government's campaign to regulate inefficient light bulbs out of existence in New Zealand. Whereas campaigns such as selling light bulbs at a discounted rate had been highly successful in getting people to adopt energy efficient light bulbs, the use of authority to force change created significant and unnecessary public resistance.

In some situations it is possible that trustworthiness can be demonstrated by admitting weaknesses – provided of course there is also evidence of strengths and expertise. In the right situations, admitting weaknesses can highlight a person's credibility and show them to be honest and trustworthy. Remember – higher credibility, lower barriers!

Principle of commitment and consistency

Most people want to look consistent through their words, beliefs, attitudes and deeds, because personal consistency is highly valued by society. Moreover, being consistent offers a valuable shortcut through the complexity of modern existence. Instead of processing all information in similar situations, it is easier to recall earlier decision and respond consistently.

Commitments are most effective when they are genuinely given, and made publicly. Once a stand is taken, there is a natural tendency to behave in ways that are stubbornly consistent with the stand. This of course can work against successful change; people who have taken a public and strong stand against the use of 1080, for example, are very unlikely to change their mind about that. However, people who have publicly declared the importance of possum control will then be more likely to follow through on actions that might be needed for that to occur. Furthermore, having people write down their decision or commitment increases the likelihood of them following through on it.

Principle of social proof

In the end, most people are followers. When it comes to decision making, or deciding what is important in a given situation or in times of uncertainty, people look to what people similar to them have done. Thus providing evidence of what other people have done and how they have benefited from that action can help persuade a doubtful audience.

In pest management negotiations, the situation can be ambiguous and the issues being discussed can be very complex. In such situations, parties will look to the experiences of other similar groups and perhaps the views of unbiased experts to guide their decision. A very recent nature conservation example demonstrates that social proof can operate in the unintended direction when applied wrongly. At the Petrified Forest National Park in Arizona, park officials wanted to stop the theft of petrified wood pieces by visitors. To that end, signage was installed saying, 'Your heritage is being vandalized every day by theft losses of petrified wood of 14 tons a year, mostly a small piece at a time'. Theft increased substantially

after the signs were installed. The visitors appeared to be responding to the statement that many other visitors were stealing. A team of social psychologists from Arizona State University later showed that a revised sign that established social proof in the right direction by saying ‘many past visitors have preserved the environment by not taking away any petrified wood’ was much more effective at preventing theft (Cialdini 2003).

Principle of liking

People tend to agree with people they like. They also like people who like them and who they see as *being* like them. Thus it is important that people in the pest management system learn to like their stakeholders (Cialdini 2001) so that their stakeholders are more likely to like them and there is better collective action!

Cialdini (2001) suggests, however, that letting another party feel that they are genuinely liked by someone trying to persuade them is actually more important than them liking the persuader. The important work here is ‘genuine’! Pest management practitioners who do not genuinely like their stakeholders should not attempt to use this as a tool. However, spending time learning about similarities can provide the means for this genuine liking to occur and, by taking the time to do this, it is possible to build constructive relationships. Pest practitioners who like to get to know people and who genuinely like the farmers that they work with are a vital part of self-help pest programmes.

4.7 Making the process ongoing

To foster a more collective approach to pest management, it is important to do more than just work together on specific projects. Individuals and groups need to learn how to apply their skills in new ways so they can turn their hand to future projects. In this sense, pest management is just one of the things that a community undertakes in order to shape the future it wants. Hence, pest work can benefit from initiatives that have already occurred within the community and it may be possible to locate local leaders and champions in places like local sports clubs, school boards or service organisations. Likewise, pest-related work that draws people to work collectively can be seen as something that builds community capacity so that helping people learn to work collectively can lead to benefits for future pest-related projects. This is evident in the Māori and 1080 example provided in Box 1 above.

For a pest management system to sustain the desired level of change over the long term it needs to evolve as society, the environment, and our pests change. As a collaborative system, it needs to be able to incorporate new stakeholders that emerge in response to changed land use practices (for example) or as existing stakeholders turnover (e.g. when new people move into a district). Similarly, agencies themselves may change, or there may just be a need to welcome and support new agency staff into the pest management system. Other changes will occur in the pest populations that we seek to control. For example climate change is likely to contribute to new pest incursions, or it may reduce the damage caused by existing pests.

Participatory evaluation processes are particularly important in these kinds of long-term endeavours, not only to ensure that the project stays on track, but also to help reinforce to researchers and stakeholders alike that continued involvement is worthwhile. Tracking and acknowledging success can be combined with a number of other initiatives to avoid ‘burn-out’ among the different participants and maintain enthusiasm and motivation. As pest managers 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, which can be used to improve the system. The process is thus iterative, with the challenge being to ensure that the lessons are gathered and applied. This adaptive management approach is illustrated in Fig. 6.

Collaborative approaches should be flexible, and designed to grow and evolve. It may be appropriate to defer involvement of reluctant stakeholders in the beginning, and new stakeholders may be identified along the way. The process must be able to change to accommodate this growth. Community involvement helps create ownership and a feeling of accomplishment in working together to solve a problem. This group dynamic will encourage others from the community and government agencies to participate and provide and manage the information required for making decisions about sustainable resource use.

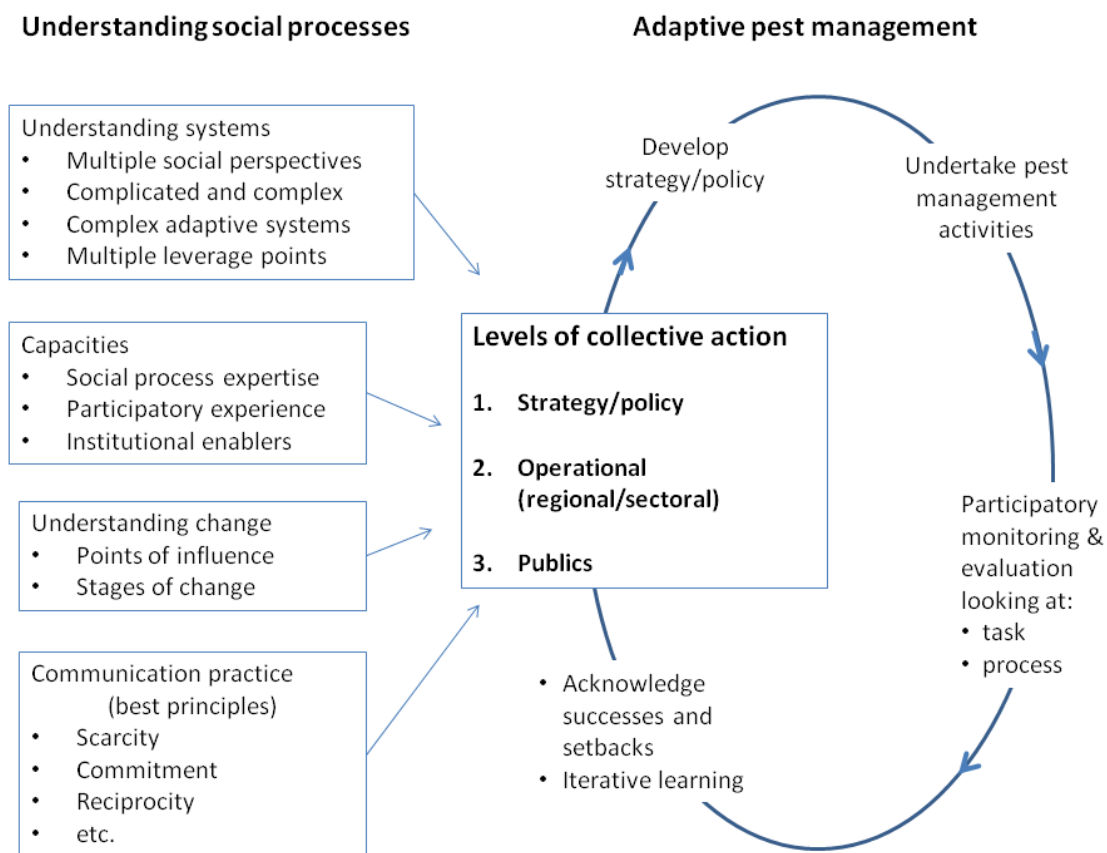


Fig. 6 This diagram shows the three broad levels of collective action and partnerships in most pest management systems. It illustrates how they are included in an adaptive management cycle, and how insights from social theory and practice can be used to inform them.

5. Conclusions

This report provides frameworks and ideas to help MAF Biosecurity New Zealand working groups in the Future of Pest Management project consider how to improve operation of the New Zealand pest management system. The focus has been on the social processes that can be used to improve collective action for pest management. People are integral to system function – from defining the work the system is there to do, to finding new ways to manage existing pests and new incursions, at both regional and national levels. One aspect of the already successful system that has been picked out for improvement is that of fostering collective action – the social activities that surround the technical business of controlling pests and halting incursions.

Seeing the pest management system as a complex adaptive system highlights the idea that uncertainty is, and will remain, an important aspect of management work. In fact, many of those who study systems would argue that you cannot *manage* complex systems. It is almost certain that no intervention will act as a ‘magic bullet’ to make the system operate in the desired fashion. Unintended consequences are common and it is well known that systems can continue without change despite interventions aimed at achieving it. The many feedback loops amongst the interacting parts result in great stability at some times, but also considerable change when a ‘tipping point’ is reached.

Despite this uncertainty, it is possible to learn about the system and to make informed interventions that move the system further towards the kind of operation people in pest management are seeking. It is good to have a range of interventions acting on multiple intervention points in the wider system. Good monitoring and evaluation helps us check that plans are on track, and helps to foster adaptability if unexpected changes occur. This allows managers to do more of the things that work well, and to do less of the things that do not work as expected.

Research into organisational change using this ‘complex systems’ perspective indicates that to successfully introduce change that sticks, it is usually necessary to make adjustments in other aspects of the system. Changing the way things work at regional councils, for example, is very likely to require changes in the processes and practices of MAF Biosecurity and DOC and amongst community groups. Likewise, changing practices in pest management in an organisation may well require changes in other parts of the same organisation or in legislation.

Working with complexity can be very challenging, particularly for public institutions and agencies, since it requires that they acknowledge uncertainty. Being genuinely committed to a participatory process also implies getting used to having less control, or at least, sharing power. Working with uncertainty requires a learning approach – that is, one that welcomes mistakes, or interventions that did not work as much as hoped, as important tools in the process of learning about the system.

A number of capacities and skills are important to work in these collaborative approaches. It is important to have access to a pool of experts in social processes to help develop strong collaborative approaches, and to work constructively through any conflict. Stakeholders,

including agency staff, should be helped to develop the skills to participate in collaborative processes. Efforts need to be made to ensure that institutional and organisational cultures support genuinely participatory processes.

Pest management work occurs in different ways at different 'levels' (e.g. national regional/local) with different audiences (the general public, communities with a specific interest in pest work, and people who work in pest management) and each level and audience requires a slightly different approach if effective collective action is to be achieved. At a 'high' level where overarching strategy and policy is developed, it is important to foster learning across silos, disciplines and professional groups within the pest management system. At regional/local level, the focus is on fostering action on the ground and on developing partnerships with regional communities of interest (farmers, beekeepers, conservationists etc.) to do this. Learning across silos is again important, but here, it is also important to develop processes that foster and support community activities around pest control. Box 3 summarises many of the lessons outlined above, and shows how they can be used in practice.

Box 3 Taranaki self-help possum control programme

The Taranaki self-help programme puts into practice a number of the ideas presented in this think piece. An overview of the project can be found at http://www.trc.govt.nz/environment/animals/pdf/self_help.pdf

The self-help programme is built on a network of good day-to-day working relationships with land occupiers in Taranaki. Because officers are assigned a particular area, they are able to get to know the people in their area and to maintain ongoing relationships. The council has learned that for the programme to be successful, they must enlist 75% support for their work before an area is brought into the scheme. Thus land occupiers go into the scheme knowing that their neighbours support it and that the work is of value to the community, thus tapping into factors outlined in the theory of planned behaviour. Enlisting 75% support also means that council has developed relationships before they begin operating in the area.

The information that the council provides allows land occupiers to see how they can manage possums in their area and how they might be able to achieve the maintenance of low possum numbers. As the scheme grows it becomes easier for pest officers to provide good examples of what other communities have achieved, thus providing evidence that the task is do-able and that there is a pool of experience out there that lends credibility and authority in the process of persuading new groups to come on board. One assumes also that the pest officers like the people land occupiers (in most cases) and are good at helping people out and telling stories of the successes of other communities that provide social proof.

A large part of a pest control officer's work is focused on assisting and supporting land occupiers in a range of different ways. They provide training and are qualified to assist farmers in getting poison licences or to provide information and advice when asked, thus lowering barriers that might prevent land occupiers from doing the control work. While it is not clear that this is the case, pest officers also offer a means for land occupiers to learn from the experiences of others and find ways to manage any problems that they strike. Pest officers also monitor pest numbers, and collect data that are then used to provide feedback to encourage landowners to keep doing the pest control work.

All parties appear to have bought into the need for the programme which taps into the values of the local communities in the area. The information sheet about the programme points to the many issues that possums create for agriculture, forestry, and biodiversity, appealing to both individual values of farm and forestry profitability, and to community values around biodiversity and being one of only three Tb-free regions in the country. This latter is a direct use of the principle of scarcity and appeals to what people stand to lose if possums are not controlled in the region.

The programme offers land occupiers a range of options for managing their pests, from paying the council to do their possum control work, to carrying out poisoning or trapping themselves. So having got agreement about the need to control possums, landowners are not coerced into a single line of action.

The theory of planned behaviour and the stages of change framework both provide information that can assist regional councils and NGOs to assist communities of interest to change their practices around pest work whether that be from a technical perspective or by learning how to work together more effectively to achieve agreed goals. Thus the theory of planned behaviour suggests that working at community level and getting agreement on the importance of pest work is an important first step in developing effective action on the ground. The Taranaki self-help programme illustrates this point nicely.

The stages of change framework highlights the need to provide different kinds of support for individuals as they develop new practices. Again the Taranaki self-help programme provides information, choices, training, feedback and encouragement to land occupiers who are participating in the programme. The programme is built on a network of good relationships that are maintained as pest officers support and learn from farmers about the ongoing situation in the areas they look after.

By highlighting the value of staying Tb free, ensuring a good base of support before bringing an area into the programme, and providing choices about how farmers might choose to participate, the programme avoids coercion and uses all of the principles outlined above, i.e. reciprocity, scarcity, authority, commitment and consistency, social proof, and liking.

Despite good examples of well-executed initiatives, it is clear that there are a number of institutional barriers to working across silos and with people from outside an organisation. These can include anything from the way funding is allocated, or the way people's jobs are delimited, through to restrictions on sharing data or being unable to spend the time needed for developing new relationships. Hence, public organisations looking to change the behaviour of others may find that they need to look inwards at their own work practices and systems, as well as outwards at those of others, when they are developing interventions.

As a final observation, we began this report stating that while it offers frameworks and ideas to help groups think about improving the way they work together in pest management, it does not offer a prescription. We go further now to point out that these frameworks need to be used with care and sensitivity. At their most negative, they can be seen as manipulation or 'spin' (something people usually pick up and react to negatively), but at their most positive they offer insights into how the system might assist people to reach their own goals. Being clear about what those goals are is a vital step in the process of partnering with people. It is easy to make mistakes around this, as some have found in working with the contentious use of 1080.

Appendix 1 offers an indicative checklist that provides a first guide to help those tasked with managing collaborative approaches. This checklist could be developed into a more refined tool in the future. It is intended to guide managers in thinking about the key elements that make collaborative approaches successful.

We also reiterate that while we can offer some tools for thinking, this report does not and cannot replace the presence of an expert in social processes in the discussion. This is no different to the idea that a technical manual or a set of scientific papers cannot replace the presence of a skilled technician or a knowledgeable ecologist in a collaborative process to address the complexities of a pest control system.

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Appendix 1. An indicative checklist for evaluating collective action

Pest management relies on a range of activities that happen at a number of levels or scales. Strategies and policies are the work of national and regional levels, and action is taken more at local level. In many cases, this action on the ground will be managed by sector or geographic partnerships. In some cases this action will need the support of groups who are more peripheral to pest management, such as members of the public. So it is useful to acknowledge three broad levels that require different types of collaboration and collective action. These are the strategy and policy level, the regional or sector-based operational level, and the general public.

Because each situation is unique, needing to meet the specific needs of different communities, agencies, sectors and other interest groups it is important to develop planning and evaluation approaches that help those tasked with managing collaborative approaches. The indicative checklist set out here is intended to guide managers in thinking about the key things that make collaborative approaches successful. This checklist could be developed into a more refined tool in the future. It is intended to guide managers in thinking about the key elements that make collaborative approaches successful.

The strength of this process is that generic issues of collaboration are covered in a way that is unique and specifically relevant to each situation. The process helps those tasked with managing such processes to reflect upon their own performance, rather than study a list of 'how- to's' that might seem self evident and would be unlikely to be retained.

Start with goals

Because collaborative activities are purposeful (they are there because people have come together to achieve certain tasks) each evaluation needs to begin by asking managers to define their goals. These goals need to be asked in terms of both general goals (i.e. the reason they are involved in the activity from the manager and his or her employers perspective), and individual stakeholder goals (i.e. the particular goals that each individual stakeholder group hopes to achieve by their involvement in this activity).

The subsequent questions that help managers develop and manage a collaborative process are set out for each of the three levels of collaboration. Some of the questions are common to more than one level. A useful way of articulating the response for each question is to use a 'traffic light' system. A green dot (or tick) means that the aspect is well covered and no more needs to be done in that area. A yellow response means that the issue needs to be thought about in the near future as it may be, or become, a limiting factor. A red response means that the particular factor needs to be addressed as it is limiting to the performance of the collaborative initiative.

These forms of evaluation are well suited to being done in a team or participatory situation. Begin by asking participants to input into the goals question. Then open each of the collaboration questions up for input from all team members. As a way of closure ask the group to come to a consensus on performance in each area. This can be done using coloured dots according to the 'traffic light' system.

Strategy/policy level

Initial

- Is there a clear purpose or set of goals for current work?
- Are we developing policy with the active engagement of key stakeholder groups, including iwi?
- Have we got an engagement plan developed, and checked, by someone with expert social process skills?
- Have we done a stakeholder analysis, and have we discussed who should be involved with the process with those who already are?
- Do we understand the different perspectives and know about the issues that different stakeholder groups are facing?
- How are we getting feedback on the quality of our understanding and knowledge?
- Do we understand what is already being done, who is doing it, and the different practices already being used?
- Have we used all of our available networks and resources to ascertain this?
- Have we got a learning group that can ground our thinking in the realities of all the different stakeholder groups involved?

Ongoing

- Are we systematically getting feedback to learn what is happening?
- Are we taking opportunities to discuss what others around us are doing and finding out in the course of their work? Do we systematically share information about the pest management related networks we deal with?

Regional or sector-based operations

Initial

- Does our plan set out clear tasks and social processes?
- Have we done a stakeholder analysis, including consideration of iwi interests, and have we discussed who should be involved with the process with those who already are?
- Have we got an engagement plan developed, and checked, by someone with expert social process skills?
- Are we aware of capacity issues both within our organisation and our stakeholder groups and how are we taking steps to correct them?
- Are we using facilitators, particularly in the early stages of the work?
- Are all stakeholders able to participate or is there some capacity development to be completed.
- Is this being addressed?
- Do we understand the different perspectives?
- Have stakeholders been involved with defining and analysing the problem?
- How are we getting feedback on our understanding of the perspectives and the problem?
- Do we understand what is already being done, who is doing it, and the different practices already being used?
- Have we used all of our available networks and resources to ascertain this?
- Have we got a learning group that can ground our thinking in the realities of all the

different stakeholder groups involved?

- Are the individuals at the table well networked and how are they communicating with the groups that they represent?

Ongoing

- How are we measuring new partnerships?
- Are there any conflicts emerging?
- Are we continually reflecting on whether there are any new players who should be involved?
- What are our indicators of success from a social perspective and are they being used systematically to reflect on the current work?
- Do our interventions support change over the different stages individuals go through?
- Are we intervening across a range of activity in a way that is well reasoned?
- How are we monitoring the different orders of outcomes from the operational work that is going on?
- Does current legislation and strategy support the work that is required on the ground?
- Are we sending feedback to assist with strategy and legislative development?

Wider publics

- Are our messages being put together in such a way that fosters positive change – do they use principles of persuasion?
- Do our messages recognise the different stakeholder groups and what their motivational points are?
- Do our messages recognise that individuals will go through different stages of change, each requiring different messages?
- Are consistent messages going out from all agencies?
- Are messages going out from different agencies in such a way that they are complementing each other?